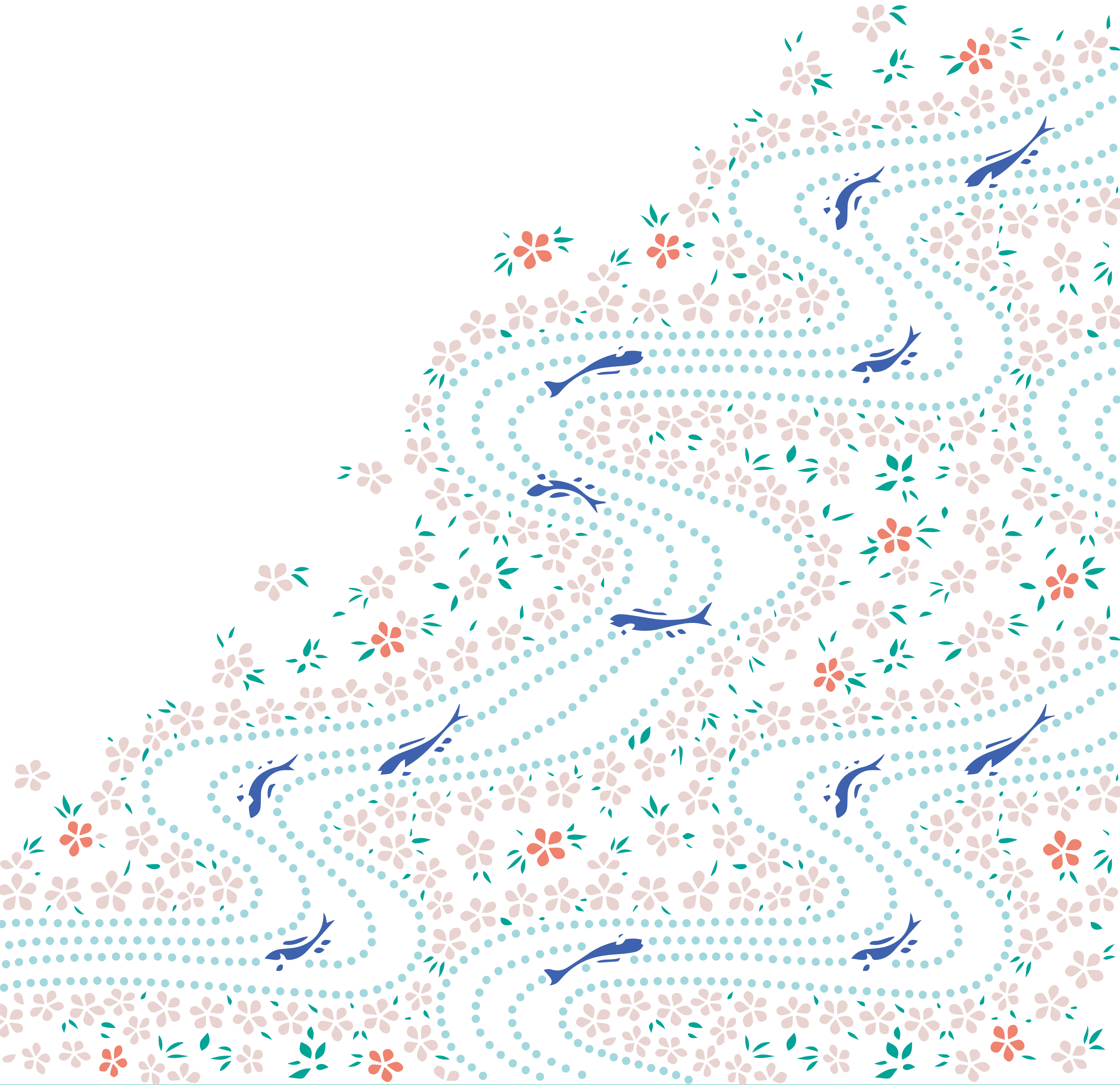
IUFRO 3.08 &6.08 Joint Conference

Future Directions of Small-scale and Community-based Forestry

Proceedings



Sep. 8-13, 2013 in Fukuoka, JAPAN

IUFRO Joint Conference

3.08 Small-scale Forestry

6.08 Gender and Forestry

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Prefatory note

Small-scale forestry provides important environmental protection, landscape conservation and rural development benefits as well as timber production in many countries. However, small-scale forestry faces many challenges in developed and semi-developed countries, especially associated with aging, declining birthrate, depopulation, and unemployment in rural districts. In order to establish sustainable small-scale forest management and to succeed it to future generations, with some countries are responding by developing policy measures such as structural reforms of fragmented forest land, consolidation of forest practices, concentration of governmental subsidies and enhancing the role of forest owners' cooperatives.

In many countries, small and fragmented forestland ownership is quite common. In some countries, communal forest ownership as a residue from feudal era is still alive and has been managed by rural community. In one hand, such communal forests or commons may be considered as a pre-modern and inefficient style of ownership and which are likely to disappear under the market economy. On the other hand, communal forests offer a variety of possibilities for conservation of ecological landscapes or healthy rural development, which we are eager to achieve in modern society

Looking at developing countries, in some cases, there has been moves for forest land tenure/ownership to be distributed to communities or individuals with the rapid acceleration of decentralizing policy in the forestry sector. Under such circumstances, researchers are struggling to analyze and understand how to accomplish a successful management of such community-based forestry, under the name of community forestry, participatory forestry, collaborative forestry, joint forest management and so on.

To better understand the present situation and the future challenges of small-scale forestry as well as different types of community-based forestry, a gender perspective is needed. This means that "gender" should not only be considered as a as an explanatory variable when searching for differences in utilization and management of forest resources, but furthermore as a concept to be explored. In family forestry for instance, research has shown that culturally conditioned ideas of what it is (or should be) to be a woman or a man, has an impact on inheritance positions, division of work and influence, and participation in management activities. The same seems to be valid in community-based forestry. However, gender research in forestry is still scarce and fragmented, and in many parts of the word there is not even any reliable gender disaggregated data that can be used as a basis for implementing gender mainstreaming in the forestry sector. Anyway, it is apparent that the number of women forest owners is increasing in many western developed countries, and also that more women are joining in the forestry in other ways. Research based knowledge on the driving forces and hindrances of change as well as the processes and the consequences are therefore essential for the development of small-scale and community based forestry.

Community-based forestry as well as small-scale forestry has the hot issues to sustain sound forest management in both developed and developing countries. The International Joint Conference in Fukuoka 2013 is therefore to be held under the main theme of "Future Directions of Small-scale and Community-based Forestry". As for discussing future directions, theoretical background or definition of small-scale forestry and community-based forestry must be analyzed and shared. Then, case studies in different countries and in different methodologies should have been piled up. Finally, future directions are to be discussed and designed as a result of all the papers presented at the conference.

We (organizing committee) would be honored to welcome many participants at this joint conference. This Conference is the second meeting of Small-scale Forestry in Japan followed by Kyoto 1997, and the first one of Gender and Forestry. Moreover, it is worth having the joint conference of the two groups at the first time. We would like to express our thanks for financial support and advertising cooperation from businesses and institutions.

Fukuoka City is a capital of Fukuoka Prefecture located in Kyushu Island. Over one million people are living in the City, facing at sea on the north and mountains on the south. We hope you could enjoy Japanese foods and culture as well as fruitful symposium and sessions.

Welcome to FUKUOKA!

Noriko Sato
(Kyushu University, Chief administrative director of organizing committee)

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[Opening session: Keynote lecture]

Present status around small-scale forestry in Japan

Ikuo Ota[1]

Abstract

Japan is one of the most forest rich countries in the northern hemisphere. About two-thirds of the land area, or 25 million ha, is covered by dense forest. People in this country has a long tradition of living in harmony with the forests. This paper aims to describe present status of Japanese forest and forestry with focusing on small-scale forest owners.

As a result of expansive afforestation during1950s through 1970s, softwood plantation forests reached over 10 million ha. On the other hand, the government intended to increase import of log and sawn timber with continuously lowering tariff rates. Domestic timber production has been decreasing since late 1960s and the rate of self sufficiency of wood became as low as 18% in the beginning of the 21ST Century. This causes a dilemma that plantation forests are maturing but these resources are not fully utilized.

Under such circumstances, the government launched a relatively strong initiative of increasing domestic forest production named "Forest and Forestry Revitalization Plan" in 2010. The plan expected to double the production volume of timber within ten years. Woodland integration is one of the key elements of this plan as well as mechanization and personnel training, but standardization of forest practices under the name of woodland integration may influence small-scale owners who have their own ways of management. A solution to solve the problems of rural depopulation must be something related to community development but efficient timber production may not be the only one. The author is going to summarize recent forest policy in Japan and to show possible future directions.

Key words: Expansive reforestation, Forest and Forestry Revitalization Plan, forest owners cooperative, private forest, woodland integration

1 Introduction

Japan is one of the most developed and highly populated countries in the world. At the same time, Japan is famous in its attractiveness of beautiful nature as well as cultural heritages. Over 125 million people are living in this small islands in which 2/3 of the land area is covered by dense forest. Forests and forest products have been playing a very important role for Japanese people and the society since the beginning of the history.

One of the notable features of Japanese culture is its utilization of wood. Traditionally all the buildings

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including big shrines, temples, and castles were wooden structure. A 1300 years old Horyuji Temple in Nara is a typical example of such wooden buildings. Even today, most of the individual houses are made of wood because Japanese people love to live in wooden houses.

Presently, forest resources are growing because of continuous nationwide plantation efforts after the World War II. Ten million ha out of 25 million ha of total forestland became plantation forest, of which majority is usable softwood tree species such as Japanese Cedar and Japanese Cypress. However, forestry in Japan today is in a critical situation. Timber production volume has been decreasing for decades, and unattended or badly managed forestland are widespread. Number of forest workers are decreasing and many of small sawmills have bankrupted. There are two big reasons for the situation. One is the governmental trade policy which facilitated timber importation. The other is the lack of sincere efforts to acquire business competitiveness in domestic forest sector caused by unnecessary governmental subsidies.

Under such unfavorable situation, some fundamental changes were desired after the turn of the Century. Both the government and people in the forest sector moved toward the new direction of domestic forestry in recent years. Timber production has already increased slightly by this policy reform and is expected to increase further from now, but there would be some undesirable influences especially to small-scale forest owners. This paper aims to describe the present status of Japanese forestry and tries to discuss its possibilities and limitations.

2 General situation of Japanese forest

2.1 Forest types by geological and climatic conditions

Japan is composed of 4 big and more than 6,800 small islands. These islands are located continuously like an arch from north to south to the east of the Asian continent. Mountain ranges exist on the major islands, and the highest point is 3,776m, at the top of Mr. Fuji, in the middle of Honshu Island. Average annual precipitation is about 1,700mm but it differs by places between 1,000mm and 4,000mm. It is why a variety of forest types exist on this country.

In the northern part of the country, especially in Hokkaido Island, boreal forest is dominant. Major tree species in this zone are fir, spruce, birch, oak and linden. Sub-alpine tree species such as tsuga are also grown on high mountains in Honshu Island. Northeast part of Honshu Island is in the cool temperate zone, and major species are beech, oak, maple, pine, and Japanese cedar. There are a lot of famous spots with beautiful colored leaves in autumn in this part of the country.

Evergreen broadleaved trees are dominant in the west and south part including Shikoku and Kyushu Islands. There are very many different tree and shrub species in this warm temperate zone such as evergreen oaks, camellia, and cinnamon trees. Having a lot of rainfall especially in summer, trees grow rapidly and most of the forests are dense and dark. These forests are rich in food for wild animals such as monkey, bear, deer, wild boar, fox, and raccoon dog. There also are some sub-tropical forests in the southern most islands in Okinawa. There are some endangered species unique in a small island such as short-eared rabbit and wild cat.

2.2 Forest ownership

Figure 1 shows the land utilization of Japan. Forest covers 67% of the land area or about 25 million ha. Majority of the forestland in Japan is in private hands. As shown in Table 1, privately owned forest is 14.5 million ha or 57.9% of the total forestland. In terms of forest inventory, private forest holds 2.86 billion m^3 or 64.6%. It reveals that private forest is in a very important position in domestic forestry rather than public forests.

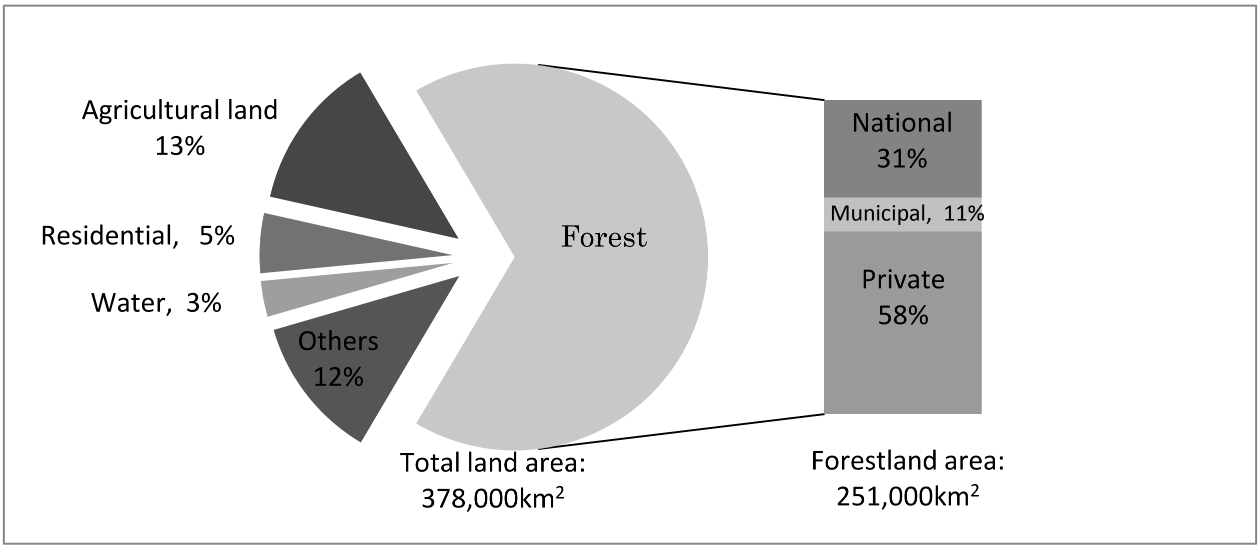

Figure 1: Land utilization of Japan
Source: Statistic Bureau (2012) Statistics of Japan 2012

Table 1: Forest area and forest inventory in Japan by ownership category (2007)

Ownership		Forest Area (1000 ha)		Forest Inventory (1000 m^3)	
National		7,686	30.6 %	1,078,272	24.3%
Non-national	Municipal	2,830	11.3 %	484,326	10.9%
	Private	14,535	57.9 %	2,863,512	64.6%
	Others	46	0.2 %	5,627	0.1%
		17,411	69.4 %	3,353,465	75.7%
Total		25,097	100.0 %	4,431,737	100.0%

Source: Forestry Agency (2012) Summary of Forest and Forestry Statistics

Because of the long history of agricultural community and land reforms in the 19th and 20th Century, most of the private forestland owners are small in scale in Japan. There are about 2.5 million private forest owners over 0.1 ha of possession but only less than 1 million households have over 1 ha. Table 2 shows the recent statistical data of private forest ownership by size class. Great majority of forestland owners are in the classes of less than 10 ha. One can say that small-scale forest ownership is a typical and common types of forest ownerships in this country. It is a notable feature of forestry in Japan.

Table 2: Number and area of forest households by size class (2010)

Size Class	Number		Area (ha)	
1-3 ha	520,123	57.4 %	851,646	16.3 %
3-5 ha	160,563	17.7 %	571,675	11.0 %
5-10 ha	119,292	13.2 %	775,994	14.9 %
10-20 ha	64,163	7.1 %	825,595	15.8 %
20-30 ha	19,504	2.2 %	442,379	8.5 %
30-50 ha	13,005	1.4 %	462,189	8.9 %
50-100 ha	6,797	0.7 %	434,883	8.3 %
100-500 ha	3,089	0.3 %	555,512	10.7 %
500-1000 ha	193	0.02 %	131,054	2.5 %
Over 1000 ha	76	0.01 %	161,632	3.1 %
Total	906,805	100.0 %	5,212,559	100.0 %

Source: Ministry of Agriculture, Forestry and Fishery (2010) Census of Agriculture and Forestry

3 Recent trend of Japanese forestry

3.1 Afforestation policy after the war

At the end of the World War II, forests in Japan were heavily degraded. More than 3 million hectares of forestlands needed to be rehabilitated. In spite of such a difficult situation, people and the society required wood materials for the recovery of the country. That was because most of big cities were bombed and burnt, and also fuelwood was the main source of energy for the people to survive. In addition, poles for coal mine was another great demand for wood because coal was the most important energy source for domestic industry at the time. Occupation forces of the US Army reported that there would be no trees left in Japan in 20 years if they continued to consume timber so rapidly as they were.

Nationwide program of restorative reforestation began in 1949. It was a 5-year program in accordance with the Economic Restoration Plan of the government. To ensure the execution of plantation on private forestlands, the government created an act, named Special Measures for Reforestation Law, in 1950. This law established legal force to plant certain kind of trees for designated area of degraded or denuded private land to the owners. Or, in case the owners could not plant trees by themselves, profit share program would be applied to complete the reforestation.

Since the middle of 1950s, Japan enjoyed high economic growth. With the rapid development of industrialization of the country, energy consumption style of the society had changed dramatically. It was so-called energy revolution. Utilization of petroleum and saturation of electricity expelled coal and fuelwood from many phases of the people's life. For example, charcoal production volume dropped from 2.1 million tons in 1955 to 590 thousand tons in 1965, and to 70 thousand tons in 1975. Charcoal and firewood were no more demanded by usual family who had gas and electricity supply in their home.

This drastic change affected a lot to rural mountainous villages. Charcoal and firewood were produced in the natural broadleaved forests, mainly in the second growth and/or coppice forests, but those forests became no more useful. However, on the other hand, industrial timber was short in supply and the price skyrocketed. Not only the government but also private forest owners were considered to cut such useless broadleaved forests and replant softwood tree species on their forestland. This was the idea of “expansive afforestation” and the government strongly assisted to do this conversion of forest type all over the country since the late 1950s. Clear felled broadleaved trees were sent out to pulp mills in order to satisfy growing demand of papers and paperboards. Genetically improved softwood trees and fertilization were introduced on newly planted areas to increase production.

Expansive afforestation was a very successful policy at the time, and areas of artificial plantation expanded and kept in a high level during 1960s and 1970s. Japanese cedar and Japanese cypress were the two major tree species for expansive reforestation. Both of them were expected to be a high quality construction lumber in 40 to 60 years, and internal rate of return of the plantation were calculated around 8% in case of good condition. Unfortunately, such high expectation was totally unrealistic. Anyway, expansive afforestation had mostly attained the goal and diminished rapidly after 1970s.

Figure 2: Age Class Distribution of Plantation Forests in Japan (2007)

Source: Forest Agency (2013) Annual Report on Forest and Forestry in Japan FY 2012: Summary

Because of above mentioned afforestation efforts after the war, plantation forest expanded up to 10 million ha now. However, owing to the fact that planting activities were concentrated in 1950s and 1960s, age class distribution of plantation trees are very clustered as shown in Figure 2. This is one of the difficult problems that Japanese forestry is facing today.

3.2 Domestic timber production and import of wood

During the high economic growth period, Japanese government enthusiastically promoted expansive afforestation on one hand, but it also facilitated import of timber in order to satisfy growing demand of timber on the other hand. Domestic timber production began to decrease in the middle of 1960s, and imported timber dominated Japanese market soon after that. Two reasons were sought to explain this decline. First of all, flood of less expensive imported timber drove out domestic timber from the market. Secondly, not many good trees were left within the accessible locations because of intense and excessive harvesting of domestic forest resources during and after the war.

Figure 3 indicates the trend of domestic timber production and import. Domestic timber production reached its peak in 1960s and continued to decrease until recent years. On the contrary, Importation expanded rapidly in 1960s and stayed at the high level for about 30 years. Under such circumstances, self-sufficient rate of wood fiber has been going down since 1960s. However, self-sufficient rate is going up in recent years. It is because domestic timber production volume is slightly going up and import is going down. As shown in the next section, new forest policy initiatives that facilitate timber production and efficient utilization lead to this positive change so far.

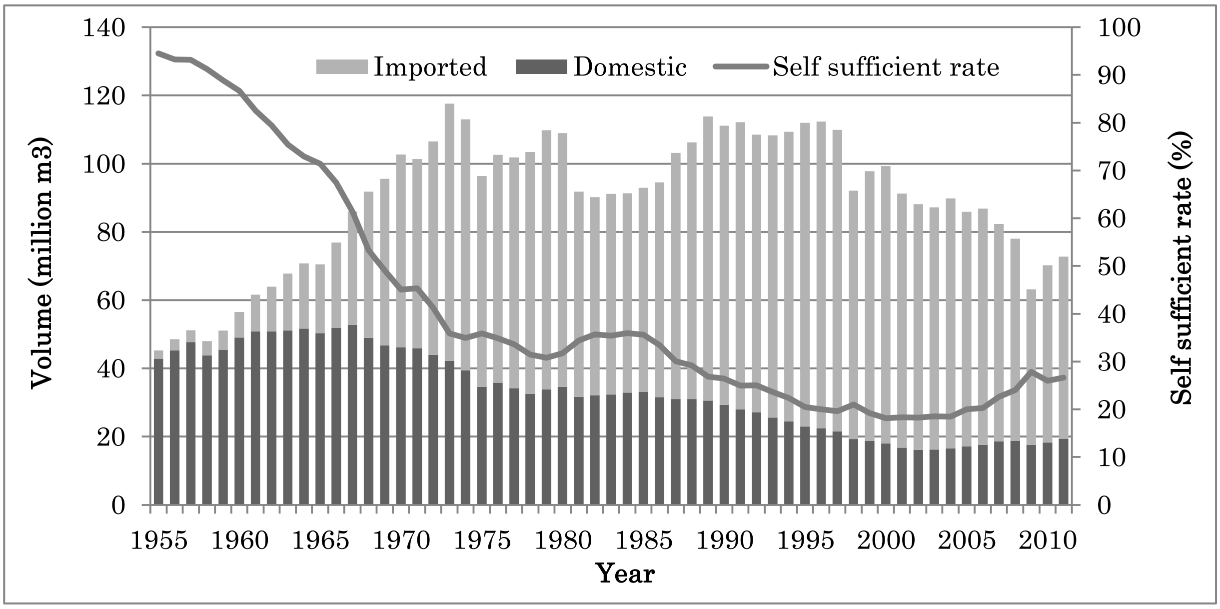

Figure 3: Trend of domestic production and import volume of timber in Japan (1955-2011)
Source: Forestry Agency (2012) Summary of Forest and Forestry Statistics

Figure 4 shows the source of wood fiber for Japanese market. In terms of construction timber, major exporters for Japanese market are USA, Canada, Russia, and European countries such as Sweden, Finland, and Austria. Plywood is from Indonesia, Malaysia, and China. In terms of wood chips and pulp, major exporters are Australia, New Zealand, and Chile.

4 Present forest policy and small-scale owners

4.1 Important legislations for forest and forestry

Related to forest and forestry in Japan, there are a few very important legislations. Forest Law of 1951 and Basic Forest and Forestry Law of 2001 are the two major ones, and Forestry Cooperative Law is another important legislation. Forest Law is the primary statute for forest management. The purpose of this law is to

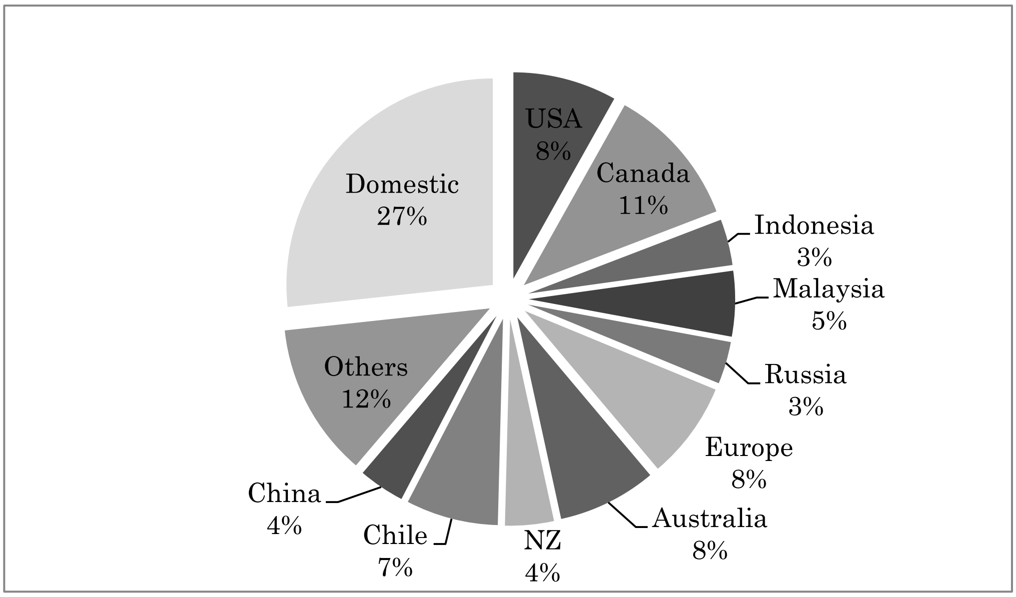

Figure 4: Supply sources of wood fiber for Japan (2011)
Source: Forestry Agency (2013) Forestry White Paper

sustain forest resources and to strengthen forest productivity in order to contribute to the protection of national land and enhancement of national economy. It designates nationwide forest planning system and protection forests.

Basic Forest and Forestry Law of 2001 is the amendment of Basic Forestry Law which was established in 1964. The most noteworthy change was the fundamental purpose of domestic forest management. The previous law placed timber production as the primary objective of forest management, but on the contrary, the new law is to place environmental functions as the primary objective and timber production as the second. It means forest policy direction in Japan has changed at the beginning of this century from production to protection.

There are two parallel purposes in the Forestry Cooperative Law. One is to improve economic and social status of forest owners, and the other is to improve the situation of forest resources. Establishment and attendance of a forest owners' cooperative is voluntary, but there are about 700 forest owners cooperatives over the country, and the number of the member of forest owners cooperatives are about 1.5 million. This means the cooperatives are very important organization in private forestry in Japan. It is interesting that the Forestry Cooperative Law focuses not only the benefits of forest owners but also the benefits of the general public.

4.2 Recent forest policy direction

A series of policy initiatives were launched in 2000s. The New Distribution and Processing System, carried out between 2004 and 2006, aimed to promote utilization of domestic timber for laminated lumber and plywood. What was new on this program was to acquire the market share of these products from imported timber by using less favorable domestic timber such as curved or inferior ones.

The New Production System, carried out between 2006 and 2010, aimed to expand utilization of domestic timber for housing construction by facilitating direct flow of timber from the forest to large sawmills. Eleven model areas were designated to demonstrate such a system and several large scale sawmills with annual consumption of 100,000 m^3 level were built.

Promotion of proposal-based forestry practices is another interesting new policy initiative. Formerly, it was difficult for forest owners to decide to whom and at what price to sell their standing timber. The proposal-based forestry practices are the idea to clarify description of cost and revenue of timber sales by trained practice planners. The government and forest owners' cooperatives have been providing the training programs for forestry practice planners since 2007.

Forestry new employment training project is the other successful initiative. It is one of the counter measures of the government against high rate of unemployment, and commonly known as "green employment". The government gives subsidies for forestry enterprises which employ new workers and provides technical training for such new employees. Thirteen thousand new employees have entered into forestry since 2003 by this project.

Following the above mentioned initiatives provided by the Liberal Democratic Party, the Democratic Party of Japan took over the governance of the country in August, 2009. The new government had developed the New Strategy for Growth in December, 2009. In accordance with the new strategy, forestry was focused as one of growing industries, and the Forest and Forestry Revitalization Plan had launched in December 2009. The plan intended to convert Japanese society from concrete based into wood based, in which we will utilize wood and other forest resources fully so as to contribute employment and environment. There are tree fundamental principles in the plan as follows: 1) To provide and sustain multifunctional roles of forest, 2) To revitalize forestry and wood products industry with fully utilizing regional natural resources, 3) To contribute to the realization of the low-carbon society through wood use for both material and energy.

Ministry of Agriculture, Fishery and Forestry set up five consultation committees for reviewing current status and prospecting possible forest policies under the Forest and Forestry Revitalization Plan in January, 2010. Titles of five consultation committees are as follows: 1) Basic policy for forest and forestry, 2) Road and operation system, 3) reforming of forest owners' cooperatives and raising forest enterprises, 4) human resource development, and 5) process, distribution and utilization of domestic wood. Variety of well-informed persons such as professors, writers, company executives, foresters, accountants, consultants, and politicians, took part in the committees.

Based on the one-year of thorough discussion in consultation committees, six objectives for reforming forest and forestry are designated. To gain competitiveness in forestry and wood products industry is commonly pursued in all these objectives. Summary of six objectives are as follows: 1) rebuilding nationwide forest plan system, 2) preparing proper rules and institutions for adequate forest management, 3) developing efficient forest road network, 4) facilitating forestry enterprises and forest owners' cooperatives, 5) Expanding utilization of domestic wood with coordinating process and distribute channels, and 6) educating foresters, technicians, operation planners and other professionals.

Woodland integration is one of the most important initiatives in this policy. By the current regulation amended in 2012, 100ha is a lower limit of making a forest management plan to which governmental subsidy is granted. Related to this matter, the idea of separation of forest management from ownership, of which revised Forest Law allowed, is a possible critical change for small-scale forest owners. With the help of this policy initiative, forest management organizations including forest owners' cooperatives can integrate small-scale forestland rather smoothly by contract base.

The Forest and Forestry Revitalization Plan looks very comprehensive and forward-looking. Forestry Agency is prospecting that timber production volume will be doubled and self-sufficient rate of wood will become over 50 % in ten years in case the plan works sufficiently well. Forest owners' cooperatives are expected to be a key organization in each locality, but the plan is requiring reorganization of the cooperatives so as to play a special role of integrating and controlling small private forestlands.

In December 2012, however, the Liberal Democratic Party recaptured the government. Forest policy direction of the former government is still alive but would be changed gradually. It is not clear what will be going on at the moment, but the direction to pursue competitive domestic forest sector against foreign companies could be kept because such idea was first realized under the policy of the Liberal Democratic Party in early 2000s.

5 Discussions

Although timber production is going up in recent years and number of new employees for forestry is increasing, general situation of Japanese forestry is still critical. There are several serious problems to be solved under the newly launched policy initiatives and the Forest and Forestry Revitalization Plan.

First of all, weakened interest for forest management in small-scale owners is one of the most critical problems today. Because of the situation of lowering timber price and increasing management cost, many forest owners have abandoned managing their forestland. In many places over the country, such abandoned forests cause danger in windfall, soil degradation and landslide. Increasing number of absentee forest owners is another reason of this phenomenon. Therefore, issues related to unmanaged private forestlands are social as well as economic and environmental problems to be solved by local and central governments. Unfortunately, we have no strong policy measures for tackling this particular problem up to now.

Another problem for small-scale owners is undergoing caused by woodland integration process. Woodland integration is a newly introduced policy measure for efficient forest practices related to proposal-based forestry practices and the Forest and Forestry Revitalization Plan. Its basic idea is to integrate neighboring small forestlands into a big area and to build effective forest management plan with constructing forest road network and facilitating mechanization. The idea looks economically efficient and rational, but it includes a serious problem for small-scale forest owners: Activities and opinions of individual self-employed forest owners would be neglected in this process.

There still are many self-employed forest owners in Kyushu, Shikoku and other areas. These people have been tending well of their small forestlands for many years by themselves. Most of them are aged but some have successors and they are eager to manage their forest in their own ways. However, woodland integration process tends to neglect such promising local forest owners and to bury them in a regulated forest management plan. High quality timber production by such self-employed owners are no more allowed and they must lost their motivation and job. That is not a small issue for depopulated rural mountainous society.

Similarly, small and middle sized sawmills are playing important role for the local economy. However, large scale sawmills established with the help of the New Production System give a great threat to them. Policy makers should be careful about the secondary effects on local society before introducing such a strong initiative. Unfortunately, it would be not the case in the New Production System.

A gap between domestic timber supply and demand of forest industry is another possible problem in the near future. The government hurried up to help constructing large sawmills by the New Production System and is promoting to build other facilities including biomass power generation plants. These factories need huge amount of wood fibers day by day, but it will be difficult to supply such amount of timber constantly from local supply sources. For example, in Kochi Prefecture in Shikoku, one large sawmill and three biomass energy plants are built or going to build within a couple of years. Each of them demands about 100,000 m^3 of wood fiber annually, but the timber production volume in Kochi Prefecture is about 500,000 m^3 in total, and most of them are consumed by local small sawmills. Kochi Prefectural government is expecting to increase timber production up to 810,000 m^3 in 2021, but it is doubtful to realize such a rapid increase in a short period. Considering the possible high pressure for demanding more and more timber to local forests, overcutting would be an another problem for the local society.

Standardization of unbalanced age distribution of plantation forests is also a difficult task. Clear cutting and replanting will be the key to do that, but the high cost of new plantation and animal damage are big disturbances. Short of researchers in the field of silviculture and forest utilization because of long lasting depressing situation in domestic forestry makes it difficult to solve the problem so far.

As mentioned above, forestry in Japan is facing with many problems. However, considering the situation of maturing forest resources, policy direction as represented by the Forest and Forestry Revitalization Plan is appropriate and timely. The projections for the rapid increase of timber production, i.e. from 18 million m^3 to 39million m^3, may not unrealistic, because annual growth of timber inventory is far big; it is nearly 100 million m^3. Possibility of Japanese forestry is considerable and expanding.

Conclusion

Forestry in Japan is in an attractive situation. It is now a growing industry, as defined by the government, after more than thirty years of misfortune. Current trend of increasing timber production was not expected at ten years ago. However, small-scale forest owners are in a delicate position against the woodland integration. Many of them are welcoming to be integrated with neighbors, but others are not. It is worth keeping an eye on such minority of small-scale forest owners in order to seek a future of diversified forestry existence in this country.

The author believes that the scale of economy is not an only way to revitalize domestic forestry. It is surely an effective way to do it but there also are some other ways we should take. Traditional high quality timber production is one of them. Combined production of agriculture and forestry including forest byproducts is another. Governmental forest policy should take into account of such kind of different objectives in private forestry as possible future directions.

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[Keynote lecture 1]

Key-note: Gender issues in European small-scale forestry

Gun Lidestav[1]

Dear Conference participants, distinguished guests, and conference organizers

I'm very pleased to be here, and honoured to be invited to give this key-note on some of my main research interest and two of the topics of which I have spent quite some time exploring since I graduated with a Master of Science in Forestry and later with a Doctorate in Forest Technology; small scale forestry and gender. During my first decade as a researcher , 1984 to 1994, I did not pay much attention to gender when trying to understand small-scale forest owner's motives and behaviour, nor did any other of my research colleagues at the Faculty of Forest Science at Swedish University of Agricultural Sciences. However, inspired by researchers in humanities and social sciences, I gradually became aware of "gender", not only as a category for distinguishing women from men, but of the concept as such and as an analytical tool with surprisingly good explanatory abilities. By that time, the early 1990tie, my sources of inspiration mainly came from Norway and UK, where rural studies and rural sociology were much more developed and established within academia than in Sweden; Ruth Gasson, Sarah Whatmore, Berit Brandth, Marit Haugen just to mention some of the frontrunners. The two latter, were and are still connected to Center for Rural Research in Norway, established in 1982 by Dr. Reidar Almås, who in 1983 published a paper on "Masculinity and femininity in contemporary countryside" (my translation). Here, he elucidated that gender is about the social and cultural aspects of being man or women, and that every society has it specific ideas of what it is to become and to be, or should be, 'him' and 'her'. This implies that femininity and masculinity, i.e. gender, are 'social constructions' shaped and transformed by men and women according to how they understand and represent themselves in relation to others. Thus, gender research in small-scale forestry, should empirically explore, analyse and develop theories on men and masculinity just as much as on women and femininity. However, most of the gender research carried out so far has focused on women and women's condition within small-scale farming and forestry while men are considered as the standard against which women are compared. Only in a few cases have men been subjected to any thorough analysis and the prevailing ideas of masculinity have been problematized (see Brandth 1995, Brandth and Haugen 2000; 2005a, 2005b). This is also the reason why my key-note on *Gender issues in European small-scale forestry* mostly will deal with women and femininity. An additional remark to be made is that the basis of knowledge is very much oriented towards Northern Europe and in particular to Sweden and Norway. Reviewing the Gender and Forestry Bibliography Database at the Forest Library at SLU (http://www-umea.slu.se/bibum/gender forestry/) I found that only a handful of the 188 European based titles reported aspects of small-scale, family

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or nonindustrial private ownership) outside the Nordic-Baltic region, and within this region the great majority refers to a Swedish or a Norwegian situation. Despite this geographical partiality, I'm prepared to claim that there are some general lessons that can be learned from the research that has been carried out, as well as from some strategies introduced and set in practice.

I will structure my key-note as follows:

- I will begin with presenting some basic figures and insights on women, men and small-scale family forestry in Europe and
- then I will introduce a conceptual model for how we better can understand the paradox of changeability and persistence of small-scale family forestry, and in particular how gender interacts with different formal institutions in the society.
- Thereafter I will talk about gender mainstreaming as an international commitment and strategy for achieving gender equality.
- In order to exemplify how gender mainstreaming can be implemented, I will use the Swedish national strategy for gender equality in the forestry sector. On this basis I will discuss means and ends in gender mainstreaming, and further how the framing and definition of "gender issues" may affect the outcome of the process.
- Finally, I will formulate some concluding remarks and recommendations for further actions and research

Women, men and small-scale (family) forestry in Europe

Within the European Union, approximately 60 per cent of the forests are considered small-scale forests, owned by about 16 million families. However, due to lack of overall ownership data gender structure cannot be determined or assessed in most countries. It is only the Nordic and Baltic countries that can present fairly reliable data. The Baltic States are represented by the highest share of female forest owners, as more than 50 per cent of them are women. In the Nordic countries, Sweden has the highest share of women forest holders, almost 40 per cent; Finland is also estimated to have the same share if forest holdings jointly owned by spouses, or other individuals, are taken into consideration (FAO 2006).

These figures illustrates that a fundamental transformation of power relations and ownership in accordance to democratic principles and private property, as in the Baltic States, also implies an equal proportion of male and female forest owners (Mizaraite and Furuberg, 2006). At least in an initial stage, will the gendered structures and practices that eludes to be transformed when they are considered to belong to the private sphere e.g. housework and childcare, be overruled by formal rules and legislation. In the long run it may be that the prevailing gender power relations will alter the balance, but that remains to be seen.

In contrast to the "Baltic case", the amendment of the Act of Succession to Farm Properties in Norway introduced in 1974, giving woman equal succession rights to family farm and forest properties, have had limited impact on the gender balance. Prior to this amendment, the Norwegian family farms were handed over to the first born son. Only if there were no sons, a daughter could be considered as heir. However, research shows that the socialisation of sons and daughters through transfer of knowledge and skills together with the traditionally coloured expectations of the older generation, have made many first born daughters give up their primogeniture (Brandth and Haugen 1998). Still only 23 per cent of the registered private forest owners are women, and the proportion of women decreases as the size of the forest property increase (Follo, 2008). Even though women might co-own property, the management is usually done by their husbands.

In Finland and Sweden, there are no such formal rules of primogeniture although the practice has been to prioritize sons, often the oldest. A forest farm can therefore be inherited by more than one, or by all the children. If the property is not big enough to be divided among them, they become joint owners. Thereby, women as wives and daughters are given “a gate of entrance” to forest ownership without outcompeting a man. Societal expectations on gender equality can thus to some extent be met within existing legislation. In addition, there is no need to bail out the other siblings, which may be a potential problem, in particular if the forest farm cannot provide sufficient income for supporting a modern family.

Research shows that women compared to men, women more often own forest properties together with others (Lidestav and Nordfjell 2005, Ripatti 1999, Kuuluvainen et al 2011) and in Sweden women are more likely to share the ownership with other relatives, i.e. an ownership across households (Lidestav 1998, Lidestav & Nordfjell 2005). Similar to Norway, women’s forest properties are generally smaller (Lidestav 2010). In general, the size of forest properties owned by women is on average three-quarter of those owned by men. Further, when divided on single and joint ownership 46 per cent of the forest properties owned by women appears to be jointly owned, and the mean size of those properties is 56.4 hectares. The corresponding figures for men are 41 per cent and 62.5 hectares. Although most men and women have become forest owners through a transfer of forestland from parents or other close relatives, sons are still more likely to take over (Lidestav 2010). Yet, from case studies it has been demonstrate that even with a rather high share of forest ownership (e.g.in Sweden), women generally have a rather low impact on forest management. This leads me to talk about women as “transitive element”.

The notion of women as ”transitive elements” in the transfer of land, was brought to my attention at a seminar on “Women and the Land – Work and ownership from the middle ages to the present days” organized by the Swedish Royal Society of Forestry and Agriculture in 2001. Based on her research on family farming in two grain growing areas of Sweden, the ethnologist Iréne Flygare claimed that women’s chances to inherit a farm depend on either being born in a family with no sons, marry a farmer, or becoming the widow of a farmer. Furthermore, the inheritance positions are established in everyday work, and the ownership is justified by the work invested in farming, particularly in the field work. As long as women’s contribution to the farm, viewed in broad terms of living and means of support of the family, consists mainly of other tasks than fieldwork, they can never compete with a man regarding property acquisition. The patrilineal succession is maintained by women that are ready to step in if a suitable man not is available but also fallow back when one appears, i.e. act as transitive elements in terms of everyday work and inheritance (Flygare 1999). Nevertheless, I found this statement quiet disturbing, both as a female forest owner and as a researcher. It made me analyse my own private situation, but also to put it in a general perspective as a researcher. At that time, I had already been able to show that 37 per cent of the forest owners in Sweden were women, and it seemed unlikely that all of these would be widowed, born in a family with only daughters or spouses of a forest owner. I did not recognize myself in any of those categories, but still I had to consider the fact that the forest property that I owned together with my sister and my aunts, was transferred to me as a gift from my mother. And how comes that the forest property and farm land that belonged to my father, and previous his father, was transferred to my brother as a purchase? By the use of official statistics, revising data from my own quantitative surveys and adding qualitative research methods like semi-structured interviews, focus groups and narratives, a comprehensible pattern emerged.

I was able to demonstrate not only that the mean size of women's forest property is smaller as well as the average number of owners per estate is higher, but also that women more often acquired the forest land as a gift or by inheritance, while the male owners more often have bought the property from their parents. Furthermore, by culture analysis I could show that those female forest owners seems to relate to the forest ownership, as well as the possibilities and restrictions shaped by traditional and gendered ideas of being a forest owner, in other ways than the concept of "transitive element" introduced by Flygare (1999). There were certainly women trying to alter the norm by challenging the idea of forest management as "men's only" work. These women make decisions about the management, either by themselves or in cooperation with partner owners, and are also performing different kinds of practical forest work. Some women express more of an individualistic view on the forest farm than an approach in line with the farm as "a project that spans generations" (cf. Törnqvist, 1995). In addition to women that can be characterized *as transitive elements* (6 out of 30 in qualitative materials) I "discovered" three more positions among female forest owners. All together they can be arranged in an interpretation model or typology, where the forest farm constitutes the fundamental condition, and the transitive element concept forms one extreme position (Figure 1). The opposite position I named *transformative agent* and in between there are *transitive agents* and *transformative elements*. The position transitive agent (TA) implies that a woman can replace a man in the "project that spans generations", if she acts as "a real man", i.e. is operationally active in forest management. Such a position was taken by seven women. The transformative element (TFE) is very much conditioned by "the project that spans generations" but still in a way that permits her to relate to and act on the property in her own way e.g. to use the property for recreation. Finally, the transformative agents position implies that

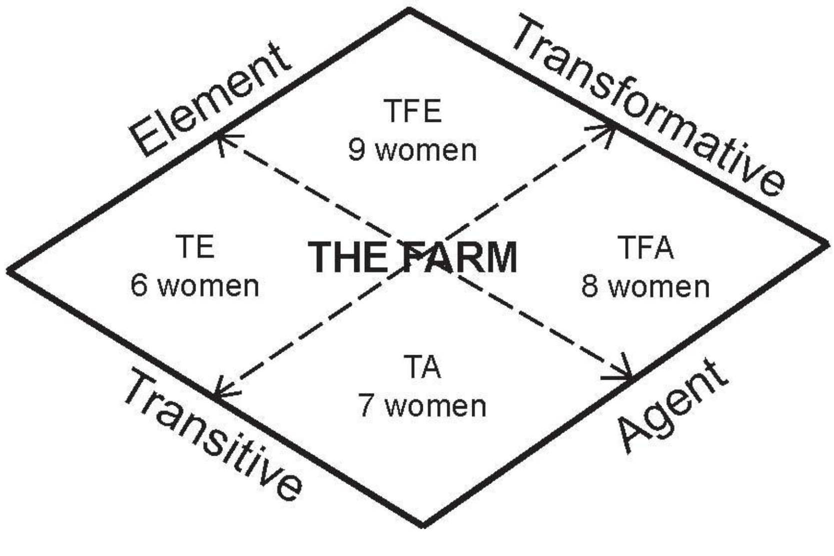

Figure 1: Suggested typology on female forest owners who have acquired a forest property from their parents/relatives in competition with a brother. (Lidestav 2010)

that the forest ownership is part of the own woman's individual life project, and it is only the individual possibilities and visions that set limits to what can or cannot be done. Women are able to change the role of a woman as well as the terms set for operation of the farm. Eight women expressed this position. However, it should be stressed that these positions must be regarded as ideal type positions. (Lidestav 2010).

In a study based on survey data regarding 1992 to 1994 gathered by the Swedish Forest Agency, Lidestav & Ekström (2000) reported less harvesting and silvicultural activity on forest properties owned by a woman compared to those owned by a man. The difference discovered could not fully be explained by the smaller size of women's properties. Applying the same method but on a data set from 2003 to 2006 included in the Data Base of Forest Owner Analysis (see Berg Lejon et al 2011) an increased harvesting and silvicultural activity on female as well as male owned properties was reported, but the "gap" between male and female owners has not diminished (Lidestav and Berg Lejon 2012). Women as single owners were less inclined to carry out final felling, thinning, other cuttings, planting, supplementary planting and cleaning than single male owners. However, women as single owners were more inclined to carry out thinning and other cuttings than men with joint ownership (Lidestav & Berg Lejon 2012). According to a questionnaire-based survey by Nordlund and Westin (2010), male forest owners consider increased timber production to be more important, and also assign greater importance to the economic aspects of forest management than female forest owners do. Further, from a case study based on income tax data in one municipality in northern Sweden, Holmgren (2006) reports that female forest owners have less sales revenue from their forest ownership in absolute terms but also per hectare of productive forestland compared to male owners. However it should be noted that the forestry activity on a holding not only depends on the owner's management attitude and capacity, but also on the natural conditions reflected by the site productivity class and the present state of the forest. Further, it should also be considered that forest property holds many values other than the production of round wood that can be used for commercial purposes. By analyzing questionnaire responses from the Swedish Farmers Association's member survey Umaerus et al (2013) found that women are more likely to be engaged as operative manager in service-oriented forest farm businesses such as tourism and green care rather than within commodity-oriented business such as traditional forestry.

A conceptual model for understanding family forestry, cob-web model

As demonstrated in a number of studies, contemporary family forestry in Europe is characterised by an increasing heterogeneity and complexity in terms of ownership structure, owners' objectives, and management practices (e.g. Hogl et al 2005). Together with on-going changes within the ownership, there exists a striking persistency regarding some aspects such as the desire to keep the forestland in the hands of the family and a social identity attached to the forest. In order to better understand the paradox of changeability and persistence, I developed a conceptual model that covers and connect institutions and concepts of significance. (Figure 2) In this model, land is considered as the basic resource around which work and family life is organised. With the land follows specific property rights, giving the children, as a result of marriage, the right to inheritance. To generate revenue from the capital invested, or to increase the value of the property, practical work and decision-making is needed. Taxes are charged on the revenue of the property. Gender has an impact on inheritance position, division of work, and pattern of marriage. By connecting these institutions or concepts to each other with threads of social practices, a 'cobweb model' is developed which allows the structure of the social reality in family forestry to be visualised. When using the model to examine social practices in contemporary Swedish family forestry, it was among other things concluded that masculinity in family forestry is to a large extent associated with being 'the one in charge' of decision-making and also the performance of many kinds of practical and administrative work by oneself. (Lidestav and Nordfjell 2005).

….Yet, it has to be stressed that a significant proportion of male owners do not perform practical work themselves, and also that a significant proportion of female owners do planting, planning of future activities, book-keeping and tax-declaration (Lidestav and Nordfjell 2005). Such management work however, does not seem to yield a status as a 'proper forest farmer'. Furthermore, the perception of being a forest farmer appears to be rather complex, and has not only to do with the performance of harvesting, silviculture, administrative work and decision-making, but also the size of the forest holding. Large owners more frequently consider themselves as forest farmers than small owners, although they are less frequently involved in decision-making and practical work including harvesting activities. (ibid)

The fact that Swedish male forest owners are more likely to have attained the forest property from their own parents - 67 per cent for male owners compared with 59 per cent for female owners - certainly indicates that gender has an impact on inheritance position. On the other hand, the female owners' inferior participation in management activities and less frequent perception of them as forest farmers, do not seem

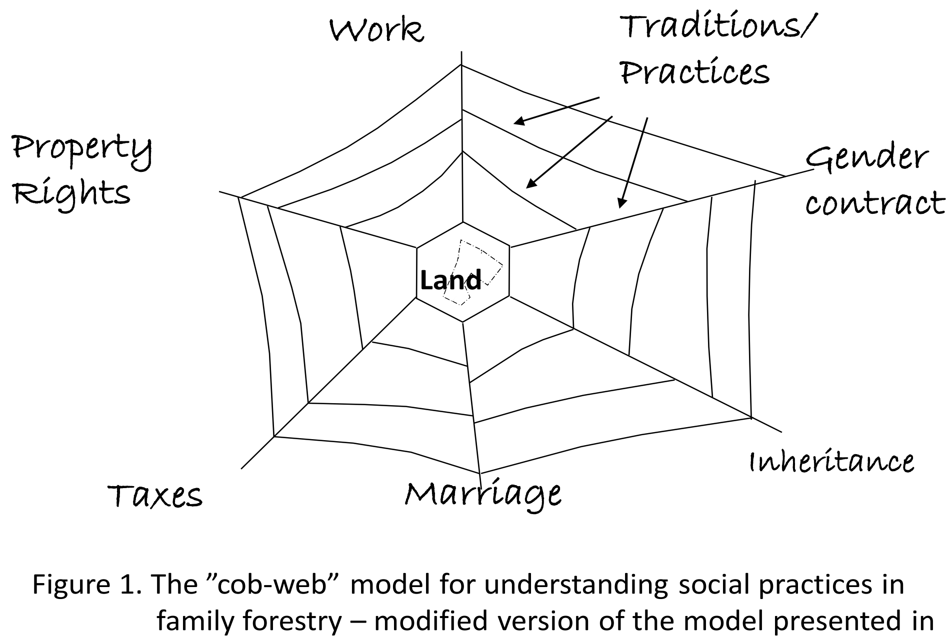

Figure 1. The "cob-web" model for understanding social practices in family forestry – modified version of the model presented in Lidestav & Nordfjell 2005

to disqualify women as heirs of forest properties. There are differences in ownership constellations between female owners and male owners, resident owners and non-resident owners, small, medium and large owners, setting up different management and inheritance conditions for the individual owner. It seems that those categories that share ownership with relatives are also more interested in letting more than one child take over the forest holding. Further, the entry to forest ownership by marriage does vary between male owners and female owners, indicating the impact of marriage as institution. (Lidestav and Nordfjell 2005) A study by Holmgren et al. (2005), using official income tax return data, demonstrates that compared to non-resident owners, resident owners invest a higher share of their sales revenue, most likely as a result of a higher input of self-employment. Finally, this cobweb model has demonstrated its general potential as a theoretical base from which to generate hypothesis and/or interpretations regarding family forestry in Sweden as well as other countries with comparable social conditions. (Lidestav and Nordfjell 2005).

Gender mainstreaming as an international commitment and strategy for achieving gender equality

At the UN Women's Conference in Beijing 1995, the participating countries agreed to adopt and implement gender mainstreaming as a general strategy for the integration of gender equality into all major policy- and decision-making processes. By such a strategy, all aspects and areas of governmental policy should be permeated by gender considerations (UN 1995). Thus, forestry and forest policy should also be subjected to gender mainstreaming wherever forestry is an independent business of some national significance. Certainly, this applies to many countries in Europe including Sweden. In order to promote the adoption and implementation process of gender mainstreaming in forestry, some steps has been taken on international as well some on national level. However, it has mainly been in terms of reviews and reports, like the "Time for Action" report developed by a Team of Specialist set up by FAO/ECE/ILO Committee on Forest Technology, Management and Training (FAO 2006), or as general statements and recommendations for the entire agricultural sector or for women in rural areas e.g. the official report on gender equality in Swedish agricultural and forestry sector (Ds 2004:39). Though, a frequently mentioned concern is the lack of relevant and reliable gender disaggregated data and monitoring systems as a major constrain for further progress. To develop such systems within each country is crucial, irrespective of the underlying reasons for the gender equality. Those reasons could be attributed as a matter of:

i) Equality and justice, which is to be considered as foremost concerns of individuals and the society.
ii) Image and legitimacy, which may be foremost considered a concerns for the entire forest industry and associated organisations (e.g. forest owners associations)
iii) Competition of skilled personnel, which in the first place goes with the individual enterprises and organisations, but in case of an overall deficit of professionals it may be a concern for the whole industry and possibly the society.
iv) A more efficient production, which is connected to iii) and thus associated with similar concerns and agents.
v) Business and market reasons, which is a matter and concern for all involved in the value chain, from forest owners to end consumers.

The Swedish national strategy for gender equality in the forestry sector

How then can gender mainstreaming be implemented in reality? And does it make any difference in terms of actions and outcomes how the issue is understood and framed, i.e. according to the attributes mentioned a bow? Let us approach the question by examining The Swedish national strategy for gender equality in the forestry sector launched in 2011 by the Swedish Ministry of Rural Affairs (2011).

As a sequel to the 1995 Bejing commitment, the Swedish Ministry of Agriculture initiated an investigatory work on gender equality in agriculture and forestry in 2002 resulting in an official report published in 2004. The title ”Det går långsamt fram …” [“Slowly advancing … “] well demonstrated the slow progress made. Thus, to speed up the process towards gender equality it was proposed that a specific plan should be prepared and implemented in cooperation with the stakeholders of the forestry sector. As the investigator notes, “government efforts to promote gender equality have so far made little impact on the sector”; therefore, specially targeted measures will be required. Further, it is proposed that “much of the problem can be successfully addressed through advice and information, ideally via existing companies in the sector” (Ds 2004:39 page 10). In addition gender disaggregated statistics should be improved and valid indicators developed through research, as well as reliable and efficient methods for monitoring and assessment of the progress. The criteria chosen to define gender equality in the sector were i) Women’s representation ii) Income distribution iii) Ownership and inheritance, and iv) Informal obstacles and structures (Ds 2004:39 page 11).

The basic approach presented in the official report, i.e. to involve the organisations active in the forestry sector to draft and implement a special plan, can clearly be identified in the National Strategy for Gender Equality in Forestry, launched seven years later (April 2011) by the Government through the Ministry of Rural Affairs. This is also well in line with the development of a governance-directed approach in public administration within environmental and forestry policies described by Appelstrand (2007). The role of the state (government) in this case is to be more of the “conductor” and setting the structure and frame for how to deal with the issue at hand, in cooperation with other stakeholders. In this case all major forest companies and the four regional forest owner associations and its umbrella organisation (LRF Skogsägarna), The forest Industry branch organization (Skogsindustrierna), The forest employers’ organization (SLA), Swedish Forest Agency, The Forest Society (Skogssällskapet), Forest contractors organisation (SMF), Female forest owners networks, Universities and colleges with forestry programs and Forest academics union were involved. Such cooperation in networks is typically based on the participant’s mutual resource dependency, where the network cooperation will work as a plus-sum-game. None of the single participants have the disposal of sufficient resources to solve the actual problem, but together they may do so. However, by creating a common understanding the state can influence the participants’ perceptions regarding what the problem is and how to solve it.

With references to Governmental Bill on a New Forest Policy (2007/08:108) and previous research, it is stated in the Strategy (2011) that the conditions for women and men to work and act in the forest sector are not equal in practice. This lack of gender equality is considered to constrain the development and the competitiveness of the sector, regarded as essential to the national economy, and thereby presented as the main argument (foundation) for the strategy. Based on the <u>vision</u> that women and men shall be given the same conditions, rights and possibilities to work in the forestry sector and to be active as forest owners, three focus areas are identified: Education, Working life, and Private forest ownership. For each focus area, a set of actions should be developed and implemented by identified actors within the sector. The outcome of those actions should be followed up by means of indicators every year, and with a concluding follow up in 2015. However, for the focus area *Private forest ownership*, which is the subject of this key-note, no criteria are explicitly set and indicators does only cover proportion of female and male forest owners in total and with < 20 hectare respectively > 50 hectare, but at least basic data for the assessment of these indicators can be accessed from Swedish Statistical Yearbook of Forestry. Also the target of the overall action is formulate in broad and unspecific terms; “Being an active forest owner should be just as natural for women as for men, and women and men should be treated on equal terms”. To achieve this, two assignment were framed and given to the stakeholders to be carried:

1) To investigate and compare the conditions for women and men to be active as forest owners and to propose actions for preventing inequalities. Swedish Forest Agency was given the main responsibility to carry out this assignment in cooperation with other stakeholders.
2) Increase forest competence in the entire forest owner family by better (adapted) information, pedagogics and activities. This assignment was given to LRF Skogsägarna respectively Swedish Forest Agency to enhance and improve training and outreach activities.

Regarding the first assignment, it should be commented that the understanding of what it is to be “active forest owner” is either taken for granted, or deliberately left vague, i.e. is open for various interpretations. However, from the overall statement of reasons for the Strategy stating that “Competiveness requires gender equality”, it can be assumed that the understanding of “active forest owner” is mainly about high and sustainable yield of timber, yet in view of environmental considerations (cf. Forestry Act § 1). Furthermore, it is apparent that the Strategy argues for gender equality based on business and market reasons. Thus, it could be claimed that gender equality has become means instead of ends.

Based on a set of investigations, six different actions has been proposed; i) increase the knowledge and competence on gender issues within the whole forestry sector ii) support interaction and exchange of experience between the different female forest owners networks iii) develop a pool of ideas and methods for enhanced training and outreach towards female forest owners iv) development of measurable and communicable targets for gender equality within private forest ownership v) development of new formulas for excursions and forest days vi) encourage forest media to evaluate how forest ownership in general and male and female forest owners in particular are portrayed. The proposed actions appear all to be justified and functional. However, the suggested budget for implementation is very modest, less than 200,000 EUR in total. Considering the well documented lack of gender equality, and importance of small scale forestry, both in relation to the Swedish forest industry and the Swedish society, it appears somehow strange to believe that gender equality could be achieved by pin money. With the rational that gender equality will increase the competiveness of Swedish forestry, one would rather expect some large scale investment from the industry paired with some kind of stat subventions.

Concluding remarks and recommendations

It appears as *gender mainstreaming* has the potential of a functional strategy for improving gender equality in small-scale forestry. However, is seems to take 15 year for an international commitment to ”trickle” through the decision-making system and become ”real action” even in countries with a comparatively advanced policy in this respect. The Swedish model for implementing “gender mainstreaming” in forestry, by involving stakeholders in the development of the strategy, seems so far to be successful. Assignments are shared and actions are taken based on the rational that gender equality will increase the competiveness of Swedish forestry. However, there is also an inherent risk in this approach, partly because so little money is invested and further, if it turns out that Swedish forestry is facing stagnation or loss of competitiveness, are women then to be blamed?

With respect to actions as well as research, less focus on women and more focus on gender and structures is recommended. In this way will also men and masculinity become problematized, which at present is very much overlooked. Finally, the need gender disaggregated statistics cannot be overemphasized.

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[Keynote lecture 2]

Sitting beneath the canopy
Messages on gender, participation and community forestry

Esther Mwangi[1]

1 Introduction

A major concern of community/small holder forestry is to identify and make explicit men and women's roles, in order to understand their dynamic interactions and its consequences on forest governance, people's livelihoods and overall sustainable use and conservation, and to seek to transform relationships towards greater gender equity in all these dimensions. Several key aspects are of interest from a gender perspective. These include: a) broad issues of access, such as access to markets, information, technology, extension services or credit, and to resources more generally; b) capacities to organize, negotiate and increase bargaining power in order to expand leadership opportunity, influence and authority; and c) benefits capture and distribution, how resources are spent at household and community levels, and the time-dependent implications of spending decisions. These three issue clusters, though not exhaustive, are illustrative of some of the key constraints and differentials faced by women and which influence the levels to which they can usefully contribute to and benefit from their involvement in community forestry.

In this keynote I will address CIFORs efforts at moving us towards a better understanding of gender relations and hopefully, contribute to a more gender-responsive community/small holder forestry. I will begin by sharing some of the interesting findings and insights from ours and our partners' research in several arenas: NTFP value chains, REDD+ projects, and forest use and management. I will talk about some general patterns that some of these large, cross-country comparative studies begin to highlight, some of the things they don't find and might wish to look for in further research. I will focus on participation, a controversial and important topic, one which is often justified along normative lines and one for which rhetoric mostly runs way ahead of the evidence.

My overarching messages are:

- Participation is a multi-dimensional concept, bringing together the attributes of men and women, their individual motivations, the structural features of their setting, and the scale and the domain/arena and activities in which they are engaged in;
- A thorough understanding of non-participation is as necessary as an understanding of participation;

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- An analytical framework and its testing in multiple sites over time is necessary

Participation has long been viewed as an essential pillar of development policy and practice. Participatory processes are those in which “stakeholders’ influence and share control over development initiatives and the decisions and resources [that] affect them”[1]. Participation is thought to be an important pathway through which individuals and groups, especially those marginalized, can have voice and influence over the decisions and institutions that impact their lives. The involvement of diverse stakeholders is also thought to improve the acceptability and sustainability of decisions, while contributions of local knowledge, time and resources is anticipated to lead to more effective implementation of decisions. In the forestry sector, participation has equally been viewed as a pathway towards improving governance, promoting sustainable use and management while enhancing livelihoods benefits and opportunities. It is a desired objective in natural resources management, for efficiency, equity and empowerment reasons. It is thus a useful entry point for analyzing the effects of interactions and relationships (the grist of public policy) in diverse arenas and for identifying concrete actions towards improving outcomes.

Gender issues are increasingly receiving attention from policy makers, development practitioners and researchers alike and all are rapidly reaching a consensus that women’s involvement in decision-making and benefits are critically important for sustainable use and conservation and as well for broader goals of poverty reduction and livelihoods sustainability. Women in particular are noted to be key users and managers of forest resources, often depending heavily on the same resources to meet theirs and their family’s needs, and holding specialized knowledge of forest species, their distribution and uses. Their exclusion from decision making arenas have been shown to result in difficulties in rule enforcement, pose challenges to conflict resolution, which are key dimensions of forest governance[2].

Women are a unique and critical stakeholder group in forestry, and over the past decade and more, the language of forest policies, laws, projects and programs have been peppered with provisions for gender inclusion and equity. Many of these provisions are aimed at strengthening and/or securing women’s rights and access to forest and tree resources, often suggest quotas for women’s involvement in forest committees and decision making organs, highlight benefit arrangements and overall seeks to ensure that women’s preferences, priorities and needs are integrated in decision making and benefits. They generally set the foundations for increasing women’s participation.

These well-intentioned efforts at increasing participation in natural resources management and development more generally have been met with strong criticism. Participatory approaches have been demonstrated to simplify highly complicated social relations, concealing existing inequalities, and not necessarily including previously marginalized groups in decision processes[3]. A large and growing literature in

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[1] World Bank. 1996. *The World Bank participation sourcebook*. Washington, D.C. : The World Bank

[2] Agarwal, B. 2009. Gender and forest conservation: the impact of women's participation in community forest governance. *Ecological Economics* 68 (11):2785-2799.

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Kothari, U. 2001. Power, knowledge and social control in participatory development. In: Cooke, B.;Kothari, U., community forestry is now suggesting that the enthusiasm for participation is way ahead of the evidence and there is cause for concern as elite capture, conflict, co-optation are increasingly cited as outcomes of people's interactions in participatory forestry interventions across multiple settings.

In the next section, I will talk about gendered constraints and opportunities in participation in value chains. The third section of my presentation shares early observations on gendered participation in REDD+ projects, while the fourth section covers determinants and outcomes of women's participation in forest use and management. The final section synthesizes lessons from these three cases of gendered participation in different and equally significant arenas of community forestry.

2 Benefits capture in gendered NTFP value chains in Africa[1]

The marketing of forest goods and services has gained currency as an essential component of programs intended to enhance livelihoods, reduce poverty and redirect benefits to poor, forest adjacent communities. Proponents of marketization often cite the potential offered by emerging and growing economies, but also niche markets in developed countries that favor the social equity dimensions of community-based enterprises in sustainably managed forest ecosystems. Thus markets for forest products are viewed increasingly as essential contributors to rural incomes and employment.

CIFORs work on market access has focused mostly on NTFP marketing and commercialization. The gender dimensions of this work are relatively recent, often as an add-on to existing work, and have focused on the use of value chain analysis as a tool for identifying obstacles to and opportunities for gender equitable participation and benefits in forest product markets. Comparative work in the dry and humid forests of Africa (Burkina Faso, Cameroon, Democratic Republic of Congo, Ethiopia, Gabon, Zambia) set out to explore women's roles, benefits and how these might be expanded across value chains of about 15 NTFPs prioritized for their socio-economic and environmental values.

Using a value chains approach, colleagues provide details on men and women's trade in each product at different nodes, from production/harvesting, processing and packaging, to storage, transporting, wholesaling and retailing. They have examined relative benefits to men and women's involvement as well as relative constraints and opportunities at different nodes of the value chain. They also assess whether and how interventions in the chains affects gender roles and benefits, and gendered opportunities and constraints.

Editors, *Participation: the new tyranny?* London: Zed Books. pp. 139-152.

Agarwal, B. 2001. Participatory exclusions, community forestry, and gender: an analysis for south Asia and conceptual framework. *World Development* 29(10):1623-1648.

[1] This section draws heavily from the following publications: Shackleton, S., Paumgarten, F., Kassa, H., Husselman, M. and Zida, M. 2011. Opportunities for enhancing poor women's socioeconomic empowerment in the value chains of three African non-timber forest products (NTFPs). *International Forestry Review* 13 (2): 136-151.

Ingram, V., Schure, J., Tieguhong, J., Ndoye, O., Awono, A., Iponga, D. M. (In review). Gender implications of forest product value chains in the Congo Basin. Forest, Trees and Livelihoods.

Results show of this studies show that there is a marked gender differentiation along the value chain. For all products (except for honey harvesting in Zambia and gum olibanum harvesting in Ethiopia) the lower parts of value chains (e.g. collecting and processing) are dominated by women. Activities here are labor intensive and poorly paid. For example collectors of gum Arabic in Burkina Faso, mostly women can earn from 59 to 79 USD per year; in Ethiopia 87% of women sorting gum olibanum in Ethiopia earn less than 50 USD/month). By contrast, in the Congo Basin men tend to dominate the harvesting of high value products, such as charcoal in DRC, bushmeat in Gabon and pygeum (*Prunus africana)* in Cameroon, often gathered from primary forests. Though women here harvest some high value products, products are mainly seasonal and include mushrooms, bush mango and safou. However, this gender differentiation in product type in the Congo Basin is in transition; men are now more likely to harvest bush mango, eru, fuelwood (traditionally women's products) due to increasing monetary values.

Property rights to resources from which men and women harvest products are also differentiated. In the Congo Basin, women tend to mostly collect products in fields and fallows which are closer to their villages. Men on the other hand harvest from primary forests and from family farms (cola nuts) or palm groves that they own (raffia palm wine). Similarly, products harvested in East and Southern Africa are mostly harvested from open access or common property forests, with the exception of gum olibanum which is harvested from forest concessions leased out to private companies.

Where men dominate in lower parts of the value chain, such as harvesting of honey and gum olibanum in Zambia and Ethiopia respectively, physical constraints (such as climbing trees), far distances, lack of tapping skills and sub-national governments rules that limit collection of gum olibanum to skilled collectors tend to lock out women.

Marketing and sales (including transportation) of most products across both East and Southern Africa and the Congo Basin are consistently male dominated. In Burkina Faso, for example, religious and cultural barriers limit women from traveling to non-local markets and from negotiating prices with mostly male buyers. In the Congo Basin, men tend to specialize or professionalize more in one or a few products and produce in larger scale –attributed largely to their increased success in obtaining credit and capital to build their businesses.

In the Congo Basin chains, benefits vary markedly for men and women involved in similar chain activities. In chains dominated by women, men generated higher profits by as much as 11%. Women harvested mostly for household consumption while men were primarily motivated by income generation. Greater access to credit advantages me, allowing them to specialize in fewer products, accumulate larger volumes and operate at larger scales than women. Contrary to general findings, income generated by both men and women were used in remarkably similar ways: to meet basic household needs for food healthcare, education, and both men and women also tended to re-invest NTFP revenues in agriculture, business and petty trade.

Though women perform a variety of functions in the value chains, their roles are not visible, either because they are operating informally, work part time, or carry out their activities at home between family responsibilities. Where women's roles are more prominent, this is primarily due to gender-orientated interventions by external agencies, for example the promotion of 'modern' bee hives in Zambia, which are placed closer to the ground rather than on trees. However, such external interventions are often at the production/collection stage (mostly linked to formal markets) and rarely in other nodes higher up the value chain. Other interventions have involved organizing women into groups—separate from men's groups. Though these have been successful in circumventing cultural barriers that prevent women from speaking out or from involvement in decision making, such divided groups may be inappropriate where women have minimal roles in the value chain.

Overall, these studies demonstrate that in both the dry forests of East and Southern Africa and in the tropical rain forests of the Congo Basin, both men and women are involved in the value chains of several important NTFPs. Activities within the value chains are gender differentiated as are benefits, with men accruing overall greater benefits due to better skills, literacy levels, credit and larger volumes. Rights and access to products is also differentiated—with women collecting mostly in fallow fields and open access areas, closer to homes and villages, while men can harvest is more distant areas but also from the land that they own. Regardless, both men and women appear to use their incomes to meet household needs but men have greater control over incomes than women.

3 Women's participation in emerging sub-national REDD+ project initiatives[1]

How does knowledge of REDD+ projects vary between women and men? Do women have a voice in decision-making in villages at REDD+ project sites? These are questions that CIFOR colleagues working on REDD+ are asking in villages that are a part of a broader global comparative study on REDD+ across 69 villages participating in 18 REDD+ initiatives in five countries: Brazil, Cameroon, Indonesia, Tanzania and Vietnam. Data were collected early in the planning stages of REDD+ projects and before activities were fully underway, allowing observations of conditions before REDD+ implementation.

Clearly communicating the potential benefits of REDD+ to women and men is critical to facilitate greater accountability and inclusive, gender-responsive implementation of REDD+ initiatives[2]. Findings of this study show that even though a modest proportion of women (58%) had heard about REDD+ project in their village, women were generally less informed than men. Larger proportions of men groups that had heard about REDD+ project (66%) relative to women's groups (40%) demonstrate a basic understanding of REDD+ and were involved in consultation processes intended to determine whether and how REDD+ projects would be implemented in their villages. This disparity between basic understandings of REDD+ among men and women in villages was least in Brazil relative to the other countries (i.e. Cameroon, Tanzania, Indonesia). In only about 9 villages (35%) overall were women involved in the actual design and implementation of REDD+, which comprised proponents introducing and explaining the project, soliciting input or training events. Men were involved to a greater extent than women and besides consultation and

[1] This section draws heavily from: Larson, A.M., Dokken, T., Atmadja, S., Resosudarmo, I.A., Cronkleton, P., Sunderlin, W., Brockhaus, M., Selaya, G., Awono, A. and Duchelle, A. (in review). Gender and REDD+: Analyzing women's roles in sub-national initiatives.

[2] UNREDD, 2011.The Business Case for Mainstreaming Gender in REDD+. http://www.unredd.net/index.php?option=com_docman&task=doc_download&gid=6436&Itemid=53

training, were involved in clarifying village forest tenure arrangements, in rule enforcement and in monitoring carbon.

The study also finds no relationship between women's use of forests and knowledge of REDD+. For example, in the villages where women groups lacked a basic understanding of REDD+, women went into the forest at least once per week, a frequency of forest use that is the same for men who were more knowledgeable of REDD+ projects. Women were just as likely as men to use forests, but were less likely to have an understanding of REDD+ projects.

At the time of data collection, none of the REDD+ proponents had listed women as a distinct stakeholder group. Four REDD+ proponents stated fair benefits to women as a broad equity goal. Overall, the data demonstrates that even though women use forests, their knowledge of REDD+ is lower than men's, and their participation in project implementation is restricted to consultation meetings and training. Men on the other hand appear to participate in decisions and activities that are central to REDD+ implementation and forest governance more broadly such as tenure clarification, rule enforcement and carbon monitoring. In the broader scheme of REDD+ these are activities and decisions that have a direct bearing on how benefits of REDD+ will be distributed in relevant villages and who will receive those benefits.

The authors hypothesize that women's lack of knowledge and participation may be driven either by their lack of capability or their lack of interest due to time constraints given multiple responsibilities in the domestic sphere.

4 Gendered participation in forest governance: Insights from the IFRI global dataset[1]

In this study, colleagues at CIFOR and IFPRI use The IFRI data set (see www.sitemaker.umich.edu/ifri/home) to answer the following research questions:

a) Whether and how varying proportions of women (low, balanced, high) in forest user groups influenced their likelihood of adopting resource enhancing management practices and technologies;
b) Whether the proportion of women in forest user groups is related to the property rights that groups hold, the type and amount of products harvested, and forest governance, especially rule making and internal enforcement; and

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[1] This section draws heavily from: Mwangi, E., Meinzen-Dick, R. and Sun, Y. 2011 Gender and sustainable forest management in East Africa and Latin America. *Ecology and Society* 16(1): 17–25. http://www.ecologyandsociety.org/vol16/iss1/art17/

Sun Y, Mwangi E, Meinzen-Dick R, Bose P, Shanley P, da Silva FC, MacDonald T. February 2012. Forests, gender, property rights, and access. Info Brief No. 47. CIFOR, Bogor, Indonesia http://www.cifor.org/publications/pdf_files/Infobrief/3750-infobrief.pdf

Coleman, E. and Mwangi, E. 2013. Women's participation in forest management: A cross-country analysis. *Global Environmental Change* 23 (1): 193): L. http://www.sciencedirect.com/science/article/pii/S0959378012001185

c) What determines the women's participation in forestry institutions and the effects of women's participation on institutional outcomes such as levels of conflict and rule fairness

In order to answer the first question i.e. whether and how varying proportions of women in forest user groups influenced their likelihood of adopting resource enhancing management practices and technologies, data collected from 151 user groups from 67 forests in Kenya, Uganda, Bolivia and Mexico were analyzed. Findings show that women dominated user groups (i.e. with number of female members more than two-thirds) are less likely to adopt forest improving technologies relative to the male dominated ones (female proportion less than or equal to one third). Also, gender does not seem to affect the regularity with which user groups undertook regeneration activities in the forest, even though mixed and male dominated groups had higher reporting of regular regeneration activities. Gender balanced groups (i.e. with women proportion between one-third and two-thirds) tend to do more monitoring than men-dominated ones, and women-dominated groups are unlikely to conduct any monitoring at all. Finally, gender does not significantly affect the incidence of conflicts in user groups, however descriptive analysis suggests that a higher proportion of women in user groups lowers the incidence of conflict in user groups.

The authors suggest that complementarities between men and women in forest management activities, for example men being able to monitor and sanction and women's roles in conflict resolution, may advantage gender-balanced groups. The further suggest that the weakness of women-dominated groups may stem from difficulties in sanctioning and a bias in the delivery of extension services.

In order to answer the second question i.e. the effects of gender composition of forest user groups on property rights and forest governance, 290 forest user groups from 91 forests in Kenya, Uganda, Bolivia, and Mexico are analyzed. Results show that female-dominated groups tend to have more property rights to trees and bushes, and collect more fuel wood and less timber than do male dominated or gender-balanced groups, consistent with gender roles. Gender-balanced groups participate more in forestry decision-making and are more likely to exclude other groups from harvesting from the forest. Female-dominated groups participate less, sanction less and exclude less. This is consistent with the previous finding.

In order to answer the third question i.e. the determinants of women's participation in decision making committees and effects of women's participation on institutional outcomes, IFRI data from two different sources were analyzed. First, a more aggregated community level data from 96 formal, forest user group associations in 10 countries with each association having a governing committee/council. Second, household surveys administered in 23 sites in Kenya, Uganda, Bolivia and Mexico.

Results from this study are as follows:

- Restrictions on membership such as membership fees and timing of meetings disproportionately lowers women's attendance of forest user group meetings
- Women's attendance of FUG meetings are higher in more educated households
- Women's presence in FUG committees is influenced by women's presence in previous FUG committees, however, women's presence as committee members in the past does not significantly influence the likelihoods of a woman ascending to position of chairperson of the committee

- Forest associations with high wealth inequality have fewer women in committees than forests with lower wealth inequality. They are also less likely to have a women ascend to the position of committee chairperson.
- When there is competition for council seats (e.g. elections) women are likely to hold fewer seats in the council than when there is not competition.
- Forest associations which had women committee members in the past are less likely to have disruptive conflict, while FUGs with high wealth inequality are expected to have a higher probability of disruptive conflict.
- The more equal the wages between men and women the less likely there is to be disruptive conflict, while the higher the percentage of household heads that are women, the more likely there is to be disruptive conflict.

The results suggest that institutional requirements for competitive elections may depress women's presence in leadership positions but that their presence in such committees serve as useful purpose of tempering the effects of conflict. The results also suggest that wealth inequality and lower education levels can depresses women's participation.

5 Lessons from beneath the canopy: A synthesis

What do we learn from these studies on women's participation?

These studies considered gendered participation from different lenses including: a) the determinants of women's participation in forestry use and management decisions; b) governance sub-outcomes of women's vs men's groups' participation in forestry decisions; c) women vs men's participation in value chains and benefits distribution of such activities; and d) women vs men's participation in REDD+ projects. A broad range of indicators were used to illustrate participation. These included levels of knowledge and information (REDD+), specific nodes/activities along the value chains of NTFPs, revenues/benefits generated from value chains and their spending, meeting attendance and timing, and membership/presence in forest user group committees. The variation in indicators and arenas of application speak to the multiple domains under which participation takes place and the multiple ways in which participation can be characterized.

The findings also indicate that structural considerations (such as norms and values, institutional rules, credit, education, skills, project design) can facilitate or impede women's participation and thus need to be addressed and accounted for by anyone interested in fostering gender equitable outcomes. The studies further suggest that these structural factors are animated at different levels in different ways—within communities, among individuals, and in the operation of external agents. Coordination and cooperation among actors are consequently central to efforts at strengthening women's participation in community forestry.

While these studies shine a light on factors influencing women's participation, they are relatively silent on factors motivating or obstructing participation *from the voices of women themselves*. While structural attributes of situations in which actors are embedded might facilitate or limit participation, there is great need to also come to terms with women's own evaluation of their participation and own stated reasons for participating. Moreover, a thorough study of those that *fail to participate* is necessary and would provide a basis for the development of programs targeted at encouraging their participation, as needed. Overall, a more exhaustive analysis of non-participants and participants and of similarities and differences between them can generate useful insights for designing good practice. It can also provide the foundations for applications to other demographic groups and interests.

The studies are also silent on the characteristics of actual decision processes in which men and women participate. None of the studies examines the dynamics of interactions and negotiations between men and women or among women, and the elements of process that may shape participation remain under or unspecified. This also ties with the question of heterogeneity. Men and women are often differentiated along other lines such as wealth and class, status, education, religion, ethnicity and how these factors may shape their powers and capabilities to act. A thorough investigation of how gender interacts with these factors is necessary for a more comprehensive gender analysis of participation.

These missing elements do not in any way weaken these efforts aimed at understanding participation by these cross-country comparative studies. They instead point to potential areas for deepening our analysis of factors that can create or perpetuate gender differentials in participation in critical domains of community forestry. These gaps also point to the need for a more coherent analytical framework that can be used for analysis and synthesis across multiple domains and settings. Such an analytical framework will need to take into account the multi-dimensionality of the concept of participation. As the studies have shown, participation can be characterized or described from different angles: the arenas and activities in which men and women are engaged; the specific activities they are engaged in; the indicators used to proxy participation; the structural conditions that may hinder or enhance participation; the individual reasons and motivations for participating; and the scale at which participation can occur, from individual to groups. The Sentinel Landscapes program of the Consortium Research Program on Forests, Trees and Agroforestry (CRP-FTA)—a long-term monitoring initiative-- provides an important basis for comparative work across different settings in Africa, Asia and Latin America.

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[Keynote lecture 3]

Women Owning Woodlands in the United States:

Status and trends in Extension outreach and education

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Introduction

Forest issues and concerns vary from region to region around the world, as diverse as the forests themselves. But we do have one distressing trend in common: a lack of effective involvement and empowerment of women when it comes to forest decision-making, conservation, management, and economics. For many of us who have worked in forest conservation and community development in developing nations, facilitating women's education and the formation of women's groups has been a known and effective educational tool for some time. As FAO summarizes, "…increasing female access to knowledge and assistance increases firewood sustainability, food security, family health, and economic security" (FAO, 2013).

Ironically, in the United States (U.S.), and probably many other "developed nations," forestry and farming have been primarily male-dominated fields. One could that in the U.S. we have done a better job incorporating women as scientists and professional foresters than we have as acknowledging women as forestland managers and decision makers. In addition, until very recently, our society has embraced a very individual and independent spirit, making the most effective assistance and outreach methods those that focus on individuals rather than aggregates of individuals. Gender aside, woodland owner cooperatives of any sort are still few and far between in the United States, and many struggle to thrive due to cultural barriers such as a perceived loss of personal rights (Hull and Ashton, 2008).

Women Woodland Owners in the United States

Throughout the U.S., women are increasingly becoming responsible for the care and stewardship of private forestlands, farms and range; they outlive spouses, inherit forestland from parents (with the societal

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evolution of primogeniture), or just seek their own land. Yet these women often feel that they lack the confidence, knowledge, and access to resources that allow them to be successful.

A 2005 survey of Oregon family forest landowners estimated that women were primary managers of 40% of Oregon's family forest ownerships, but only comprised 20-25% of education participants and 10% of forest landowner association memberships (Cloughesy 2005). According to the 2007 USDA Agriculture Census, the number of women farmers and forest owners increased 19% from 2002 to 2007. These women landowners tend to have smaller parcels, lower total sales receipts, and are less likely to attend educational events or be aware of assistance opportunities (Dougherty and Hilt 2009) than their male counterparts. This puts women at high personal economic risk, which results not only in poor management of resources, but high likelihood of working forest and farm sale and conversion to a non-working land use, such as development.

The future generations of landowners will include more women, and they appear to have different objectives and educational needs than males. A study of forestland owner offspring conducted for the National Association of State Foresters showed that 83% of women sampled were interested in managing their family forestland when transfer occurred, but only 34% felt they had enough knowledge to make forest management decisions (Mater 2005). This study pointed out that women offspring and beginning women managers often had different land management objectives than their male counterparts including higher interest in managing for non-timber forest values and products, and enhancing wildlife habitat, not to mention the desire to maintain the legacy of their family's land.

Current U.S. forestry assistance programs are not meeting women's needs

Redmore and Tynon (2010) showed, in a study of participants of the Oregon Women Owning Woodlands Network (WOWnet), two major barriers to women's involvement with forestry organizations outside of WOWnet were a feeling of not being welcome, and a lack of basic vocabulary knowledge that made attending meetings and Extension programs intimidating. Some still felt the need to prove their abilities working in forestry, and others expressed that femininity could be a barrier for women in forestry. Despite all this, many women emphasized that they had positive experiences in forestry. Participants expressed that they faced unique challenges to forest management, especially as the irregular lifestyle associated with forestry could be difficult for women who also run a household. Women communicated and networked in forest management through involvement with a variety of natural resource based communities, in general, and WOWnet, in particular. WOWnet, however, was found to be unique from other communities because it was more collaborative, practical, and peer-based in its approach. The female perspective, both in terms of the kind of information and the delivery of information, also drew many women to WOWnet. Redmore and Tynon recommended that Extension shift away from a traditional top-down model of knowledge diffusion to a more participatory approach where university, Extension, and landowners engage in discussions of land management.

This study and others, as well as many anecdotal stories, and requests for information on how to start their own WOWnet from Extension and other outreach entities around the country, are showing us that many women woodland owners are disproportionately missing out on the education, technical and financial assistance, or mentoring available through traditional landowner organizations and service, educational, and assistance programs.

One reason women may not be attending programs, aside from feeling intimidated and unaware of opportunities, is that traditional landowner education programs work on an individual level and position learners as passive subordinates, absorbing information disseminated by experts. In addition these programs are usually offered on timber-oriented topics, which we have learned are not always a top priority for women landowners. Many conventional programs fail to reflect adult learning research which shows that adults identify with facilitators rather than authoritative instructors, prefer hands-on experiences, identifying problems, brainstorming, imagining, leading, and getting work done with peers (Drago-Severson, E., S. Cuban, K Daloz, 2009). Adults may not be moved to act on, or even bother to attend, programs they do not feel reflect their needs or interests.

Women need not only learn silvicultural science and chainsaw safety to be informed stewards; they also need to identify themselves as capable forest stewards, as part of a broader community. As many of our traditional forestry programs focus heavily on transmitting content, they are missing other critical pieces of adult education, including community development and emotional empowerment, especially as it pertains to adult women entering a predominately male community.

Programs currently targeting women woodland owners in the United States

Case Study 1: The Oregon Women Owning Woodlands Network

In 2005 Oregon State University (OSU) Forestry and Natural Resources Extension worked with a female steering committee to develop the Oregon Women Owning Woodlands Network (WOWnet), an Extension program designed to:

a. Recognize the growing number of women taking a wide array of active woodland management roles
b. Raise basic forestry and decision-making skill levels among women woodland managers through hands-on educational opportunities
c. Support and increase women's access to all forestry-related resources, and
d. Encourage communication among Oregon's women woodland managers through the development of statewide and local networks.

Since its inception, this program has grown to include 380 members in nine counties. This program initially facilitated 24 – 36 local programs per year. As the program has evolved, and institutional capacity has decreased, we now hold an annual 3 day retreat, 6-9 local programs, and provide additional support through email listserv, website, and Facebook interaction. WOWnet serves as a model that empowers women and can empower other groups through its collaborative learning approach. This program has inspired a national initiative and programs in other states, which are described further in this paper.

Case Study 2: Pennsylvania Women and their Woods

A desire to be more connected and learn with and from other women in similar land management roles has led a group of women forest landowners in northeast Pennsylvania to form *Women and Their Woods* (WATW). In 2008, with the support of the Delaware Highlands Conservancy and the USDA Forest Service at Grey Towers, a group of women landowners met to learn more about the forests they own and how to connect with other women forest landowners. During each meeting, women would share information, ask questions, meet professionals, and enjoy a potluck dinner. In 2011, the partnership expanded to include Penn State Cooperative Extension and offered a long-weekend educational retreat for twenty-three women who own or manage forestland. Interested women were sought to join a network and serve as mentors to other women forest landowners across the state.

Through ongoing trainings and meetings, women forest landowners continue to receive the support of Extension and the Conservancy. Post retreat, attendees have been encouraged to reach out to other women landowners and share their knowledge about the *Women and Their Woods* program in their own community through whatever skills and interests they feel they have at hand, with the goal of forming regional networking groups for women forest landowners across the state. A sampling of some of these participants' goals include:

- "Contact local 'Mountain Home Magazine' to possibly write an article on the WATW program."
- "Design/host an early spring program on chainsaw safety; design/host a program on wildlife habitat."
- "Learn more about my forest and share with others in the WATW program."
- "Give a short talk on acorn medicine."
- "Educate youth and adults regarding forest management, habitat, and resources."
- Native storytelling re: Mother Earth flora and fauna
- Plan a chainsaw safety demonstration and training.

Support for women forest landowners has been expanded through quarterly *Women and Their Woods* newsletters (now going to over 300 recipients) and a *Women and Their Woods* website, hosted by the Delaware Highlands Conservancy (http://www.delawarehighlands.org/watw).

Case Study 3: MN Women's Woodland Network

In 2008 the University of Minnesota created a steering committee to address the disproportionate representation of men in traditional woodland owner education programs. The committee conducted a literature review, including the work of the Oregon WOWnet group, to see how to better reach women woodland owners. As a result of that committee the first MN Women's Woodland Network groups took shape in Fall 2009. This program is dedicated to building a community of women woodland owners, their families and land managers to nurture a land ethic. The MN Women's Woodland Network (MN WWN) creates supportive, informal, small group learning opportunities on topics that include trees, nature, and caring for the land. In two years this program as increased to six groups across the state reaching 300 individuals including husbands, sisters, and children.

Case Study 4: Arkansas Women Woodland Owners

The University of Arkansas (UA), Division of Agriculture, recognizing the increasingly larger roles that women fulfill in managing and owning agricultural, livestock, and forestry lands and enterprises, began a women in agriculture focused program in 2005 with the first Arkansas Women in Agriculture (ARWIA) Conference. A steering committee of 20 women representing diverse stakeholder groups from around the state was created to plan future conferences and meetings. The organization has hosted annual conferences since 2005. Forest resource management, timber sale methods, timber taxation, and forest estate planning sessions were included in several of the conferences.

In 2008, the UA Cooperative Extension Service, working with partners including the Arkansas Forestry Commission developed a program series specifically targeting women forest landowners. These workshops were focused primarily on forest management including information regarding cost share programs, management plan development, and the general cost of forest management. When the program leaders asked different groups of women for feedback, the topics of interest were surprising. Instead of technical assistance and expert advice, the women wanted to learn in a more hands-on manner and appreciated the presentations that were more reality-based or more personal. Extension foresters were forced to consider that perhaps they needed to learn more about what this new audience wanted or needed.

The U.S. Women Owning Woodlands Project

The Women Owning Woodlands Network Project is a collaborative project involving Extension agents from around the country with experience developing women forestland networks, as well as peer learning and participatory instructional design expertise. The goals of this project are to increase engagement and empowerment of women woodland owners by providing practical tools that allow anyone, from an inspired landowner to natural resources professionals to develop and facilitate a peer-learning network.

The target audiences of this project include, but are not limited to:

- Educators and association leaders involved with forest and rangeland communities in the United States.
- Women who own forest or rangeland and are not currently engaged in their respective forestry or range communities.

- Women who own forest or rangeland and stand to serve as mentors or facilitators of these peer networks.
- Women who may not currently be managing, but who stand to inherit or otherwise acquire forestland.

Outputs from this project include a national Women Owning Woodlands website

http://www.womenowningwoodlands.net and Facebook page: https://facebook.com/orwownet. These two tools serve to raise awareness and provide relatable content in different formats. We utilize 15 regional authors to contribute content that includes stories, technical information, event announcements, and creative contributions including photos, poetry and videos. The project team has also developed a "Growing your Women Owning Woodlands Toolkit," a multi-chapter toolkit that provides interested stakeholders with hands-on advice, worksheets, and background information to develop, plan, maintain, and evaluate any peer-learning network. In FY2013-2014 these tools will be marketed and training will be provided for using them. Evaluation will occur in 2014.

Summary

Women are an increasingly important land management demographic in the United States. In response to data and studies showing us that women are not being reached and engaged at the level they are entering the forestry community, more relevant tools and outreach methods are being developed. An additional benefit to these events is that Extension and outreach personnel throughout the country are learning new participatory instructional design methods that will appeal to our changing culture and society.

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[Keynote lecture 4]

Gender relations and the role of women's groups in Japan's forest and forestry sector

Sato, Noriko[1]

1 Background and objectives

As pointed out by Lindestav and Reed (2010), of the 1,300 gender-related articles from academic journals or conference proceedings registered in the SLU Forest Library Database, 291 were about Asian cases, comprising the largest proportion, followed by those about European cases. However, most of the articles on Asia were focused on community-based forestry in South and South-East Asian countries such as Nepal, India, Thailand, and Indonesia. Very few gender studies on East Asia, including Japan, have been implemented.

Regarding sustainable forest management in both developed and developing countries, it was estimated that effective requirements are needed to establish women's groups at the regional level and to support those groups as well as institutional reforms, such as educational systems and land tenure for women (Arora-Jonsson, 2010).

This study aims to examine the following three points. The first is to overview female positions in primary industry and the policy of gender equality. The second is to identify trends in Japanese women's status in forestry sectors under small-scale ownership, based on previous studies and statistics. The third is to examine the formation of women's forestry groups and their activities from the 1980s onward. Case studies were implemented to observe the following four groups, which have different processes: (1) the MORIMORI (Forest & Forest) network, (2) women's forestry study groups, (3) Ladies' Network 21 for the Creation of Wealthy Forests, and (4) the "Forestry Girls @" groups.

Lastly, I would like to suggest challenges for the Japanese forest and forestry sector toward the future of small-scale and community-based forestry from a gender perspective.

2 Trends of research and policy on rural gender: The backwardness of the forestry sector

In 1999, the "Basic Law for a Gender-Equal Society" was legislated in Japan, and many programs in every sector have since been introduced to bring it about. However, the social status of Japanese women remains low. The situation has also been pointed out internationally and it should be improved. For example, according to the Gender Gap Index, in 2012, Japan's score was 0.6530, taking 101st place out of 135 countries. (The score is an average of four categories: "economic participation and opportunity," "educational attainment," "health and survival," and "political empowerment.") It was pointed out that the

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political empowerment and economic opportunity of Japanese women are particularly low (Hausmann, 2012).

In the field of agricultural economics and rural sociology, gender-related research in rural communities became active in the 1990s. Ouchi and Hara-Fukuyo (2012) clarified that solid gender relations have been preserved more in rural societies than in civil societies, though wide-ranging measures for rural women have been developed since the 1990s. The “Food, Agriculture, and Rural Areas Basic Act,” legalized in 1999, and the “Fisheries Basic Act,” legalized in 2001, began a discussion concerning the promotion of women’s participation. Therefore, the progress of these situations has been reported in annual white papers.

Agricultural extension has provided services to promote family management agreements among family members and to support female entrepreneurs. However, in the 2000s, these rural gender policies were retracted by administrative and financial reform, and there was also a backlash against gender-free thought by politicians who advocated the division of labor by gender roles. Since 2008, Japan has been in a state of population decline, and future workforce shortage is a concern. In such circumstances, the need for measures to help women balance their home and work responsibilities has recently been emphasized. In June 2012, the Japanese government formulated an action plan called “economic revitalization through the promotion of women’s activities.” In rural areas, women’s activities have been expected in the “sextiary sector” (primary industry combined with secondary and tertiary industries), which is regarded as the final trump card for rural development.

However, looking at the forestry sector, the basic “Forests and Forestry” law, revised in 2001, does not have any gender-related chapters. In annual reports on forests and forestry from 2004 to 2011, the promotion of women’s participation was given only a one-line mention as a measure of the cultivation of human resources. These circumstances show that the priority of gender equity in the forestry sector is lower than in other primary industries.

The 2012 annual report described the activities of the women’s groups “Ladies Network 21” and “Forestry Girls @” over a period of nine years. The 2013 annual report covered this topic more broadly, with two pages on cases of women’s social advancement in varied forestry-related fields (MAFF, 2013). Yet, these were only illustrative introductions, not analytical appraisals. The socio-economic aspects of forests and forestry from a gender perspective are less well understood in Japan.

3 Gender relations in Japan’s forestry sector

3.1 Characteristics of Japanese forestry and women’s status

In Japan, 58% of forests are privately owned. According to the 2010 Census of Agriculture and Forestry, 5,213 thousands ha—around one-third of private forests—were held by 907 thousands forestry households (1ha and more). The average size was 5.7 ha. Seventy-five percent of these households owned 1 to 5 ha, comprising 27% of the total forest area. Only 0.4% (3,358 households) of the total number owned 100ha or more, accounting for 16% of the total forest area. Although Japanese forest ownership is generally small-scale and fragmented, uneven distribution does exist both regionally and hierarchically.

Koroki (1994) pointed out that 50 ha was the line at which forestry households can be separated by analyzing the Census of Agriculture and Forestry. Almost all households with less than 50 ha had implemented planting and tending operations using their own family workforce (family-run forestry), while households with 50 ha and more normally ran operations with employees or contracted forestry companies/associations (landlord-run forestry). Therefore, issues regarding forestry households should not be discussed as one group. Categorized observations should be completed due to differences in socio-economic status.

In addition, I would like to briefly explain the features of Japanese forestry. Japan devoted many resources to converting devastated clear-felled areas and natural forests to plantation forests for about 20 years, beginning in the late 1950s. This enormous task established 10 million ha of plantation forests. In addition, the plantation areas required a workforce during the early stages of plantation tending, due to Japan's location in the Asian monsoon area. In particular, glass cutting is very cruel work in the hot and humid summer season. Family members in small-scale firm-run forestry households took a central role in the hard work. Many women in these households were involved in the hard work as the wives, daughters, and daughters-in-law of the householders (Table 1).

In the 1970s, women's status drastically shifted from family workers to employees, decreasing the total number of persons engaged in forestry. The number of women engaged in forestry has since declined, but the number of men has recovered since 2000. If the number of workers in 1955 is seen as 100%, the corresponding proportion of men in 2010 was 15%, while that of women was 7%. However, when we look at trends by age, the percentage of women in their 20s and 30s has increased. In the 2000s, it was pointed out that women's status had shifted the composition of employees (57% to 72%) and family workers (36% to

Table 1: Transition of the number of persons engaged in forestry by sex and employment status

			Year	1955	1960	1970	1980	1990	2000	2010
Male		No. of persons engaged in Forestry		393,604	328,012	167,486	139,518	89,832	55,613	59,478
			(AD1955=100)	(100)	(83)	(43)	(35)	(23)	(14)	(15)
	Employment Status (%)	Self-employed, employing others		2%	2%	4%	5%	6%	7%	4%
		Self-employed, not employing others		30%	25%	14%	15%	17%	18%	10%
		Family workers		12%	9%	2%	3%	3%	3%	2%
		Employees		55%	64%	79%	76%	72%	68%	79%
		Directors		—	0%	1%	1%	2%	4%	5%
Female		No. of persons engaged in Forestry		125,121	111,393	38,547	30,082	17,668	11,540	9,075
			(AD1955=100)	(100)	(89)	(31)	(24)	(14)	(9)	(7)
	Employment Status (%)	Self-employed, employing others		0%	0%	0%	1%	0%	1%	0%
		Self-employed, not employing others		2%	3%	3%	2%	2%	2%	1%
		Family workers		76%	65%	26%	29%	37%	36%	20%
		Employees		22%	32%	71%	68%	58%	57%	72%
		Directors		—	0%	0%	1%	2%	5%	6%

Source: National population census

Note: The Japanese Census is taken every five years; data on citizens' residence and employment status is current as of October 1 of each survey year. Respondents are supposed to fill in the category of employment in which they worked the most hours during the week before the survey date. Therefore, part-time work is not reflected.

20%). This change means that the younger generation began to engage in forestry as employees. It seems that there are three background reasons for the recent change. Firstly, many plantation forests are reaching harvesting age, which has actually increased the harvest volume and self-sufficiency rate. Secondly, the demand for forest workers in the process of thinning and final cutting has been increasing. Thirdly, support measures for the employment promotion of the younger generation, such as "green employment programs," have been developed (MAFF, 2013).

On the other hand, women's position has consistently remained that of employees or family workers, who comprised 92% of the total women engaged in forestry in 2000. There are fewer women of "Self-employed" status as managers of family-run than men.

3.2 Inheritance of forest property and women owners

In Japan, the post-war Civil Code (enacted in 1947) legally increased the asset distribution ratio to spouses and approved equal rights for children regardless of their sex in the inheritance of assets. However, in the case of agricultural or forest land, the succession of a family business is so focused that the land is still inherited by one of the children (usually the first son) according to the traditions and customs of the region—although it has been pointed out that there was customarily a division of succession in some regions, and there are more examples of forest land than agricultural land being divided among daughters as asset compared with agriculture land (Ushiomi et al., 1961). According to a survey of feelings about forest management conducted in 2011 (MAFF, 2011), 85% of forest owners who have expected to transfer their businesses to the next generation chose the option, "I want to transfer my forests to one successor by inheritance." Forest owners who earn their income by selling wood every year have a high tendency to pass on their inheritance to one successor. That is the reason why forest owners need to deter land division in order to maintain family-run forestry management.

In Japan, statistical data on forest owners' gender has not been examined. The closest data was probably the data on "family-run forestry management bodies,"[2] which was examined in the 2005 Census of Agriculture and Forestry. According to this census, women accounted for only 6.5% (11,604 persons) of total heads (178,229) of family-run bodies, and 57% of the women were 70 years old and older. The average age of the women heads (69.6) was higher than that of the men (63.5). This shows that very few women have led forest management as owners or heads up to the present day, and a large number of aging women are expected to become owners or heads of forest management after the death of their husbands due to the lack of next-generation successions.

Moreover, according to a survey conducted by the Ministry of Agriculture, Forestry, and Fisheries

[2] A "family-run forestry management body" has been a household defined by the following conditions since the 2005 census:

1) Holding 3ha or more of forests and having conducted forestry operations for at least 1 year in these 5 years.

Or 2) Holding 3ha or more forests and establishing a forest management plan.

Or 3) Operating afforestation/tending commissioned by others.

Or 4) Operating harvesting of logs of 200 m^3 and more commissioned by others.

(MAFF, 2011), 60% of sampled owners chose the following options: "I have not decided on my succession" and "I can't hand over my land to the next generation under the severe conditions of forestry these days." Therefore, the reality is that Japan could be in a very vulnerable defensive situation in that the forests will likely be abandoned without a legal process of change of ownership after the death of the present owners, or they will fall to a lower level of management by new owners who live in cities.

I would like to mention the rights of Japanese *iriai*, or "commons," forests, which are of particular interest. Although the *iriai* system depends on the community's customs, generally members of *iriai* have belonged to certain households that have had particular responsibilities in the community. Almost all of the heads of member households are men. The central government has recommended that *iriai* members modify the system, transfer the common rights to individual rights, and/or establish a jointly run regional association. However, the present heads of households have remained members of the new associations and the male-dominant society.

3.3 Women's position in forest owners' associations

According to the statistics of forest owners' associations in 2010, the percentages of women executives, staff (regular employees), and forest workers in 426 associations nationwide were as follows. Of the 486 full-time executives, only two were women (0.4%), and of the 7,653 part-time executives, only 30 were women (0.4%). This percentage of female executives in forest owner associations is remarkably low compared to that of agricultural cooperatives (2005: 1.9%, 2010: 3.9%) (Gender Equality Bureau, 2012).

On the other hand, out of 7,190 staff members, 1,658 were women (23.1%). In fact, female staff members were not employed as professionals, and the wage levels of female staff members were lower than that of males. As for forest workers, out of a total 26,055 workers, 1,862 were women (7.1%). In terms of work type, women account for 2% of workers engaged in felling/logging, 4.8% in planting and tending/weeding, and 17.7% in other areas, such as work in saw mills, that are directly managed by the associations.

Percentages of females employed in the labor force by the associations are divided into two major work types: harvesting and planting/weeding (tending). The ratio of women engaged in planting/tending is higher than that of harvesting, and the ratio of women age 40 and over is higher than women under 40. In comparing the figures from 2010 with those from 2000, we find that the percentages of women in all age groups decreased over those 10 years, especially regarding female workers aged 50 and over who are engaged in replanting and tending, whose number decreased from over 15% in 2000 to less than half that in 2010.

3.4 Increase of female students in university forest science departments

The low percentage of female owners and executives in forest owners' associations is solid proof of Japan's male-dominant society. However, the disproportionate number of female students who have made special study of forest and wood sciences has increased since the 1980s.

I would like to introduce the case of Kyushu University, which celebrated its 100th anniversary last year.

Three years after the establishment of the Faculty of Agriculture in 1919, the Department of Forestry was established in 1922. The department produced its first female graduate in 1971. This means that no women at all had attended for the first 50 years. When we note the chronological changes in the number of female graduates from the undergraduate course, we see that two women graduated in the 1970s; four women graduated between 1980 and 1984 (5%); six between 1985 and 1989 (8%); 20 between 1990 and 1994 (24%); and 20 between 1995 and 1999 (24%). Yet, between 2000 and 2004, 72 women (46%) graduated from forestry and global forest science courses, followed by 82 women (41%) between 2005 to 2009 and 37 (31%) between 2010 and 2013. These courses were established through the consideration of the Departments of Forestry and Wood Technology Sciences in 2000. An increase in the number of women attending university and a growing interest in global environmental issues has raised the ratio of female students in university education since the late 1980s, producing more female graduates. The most common forms of employment for these female graduates, at around 30%, were that of forestry technical personnel in central and prefectural governments or researchers in universities and public/private research institutes. Other female graduates have sought jobs in private companies that were not always related to forestry or wood. In addition, not a small number of female graduates have changed their minds and have left the profession to marry and have children. Moreover, some female graduates have sought any job or activity they could in order to support rural areas and forestry in various ways.

4 Features of women's groups and their activities in the forestry sector

4.1 Group activities of female forest owners: MORIMORI (Forest Forest) Network

In the current situation, in which there are very few female forest owners, the establishment of regional women's groups related to forests and forestry is not popular in Japan, unlike in Europe and the U.S. There is only one example at the national level: the MORIMORI (Forest Forest) Network. The non-profit organization (NPO) "MORIMORI Network" was founded in 1996 by female large-scale forest owners and urban women. Their catch phrase was "From Forest to City and from City to Forest." The group's objectives are to foster a wealthy forest society and wood culture by networking and mutually exchanging their experiences, and to demonstrate their importance to men, the business community, and administrative agencies from the viewpoint of women who have had actual societal experience. MORIMORI's activities include tree-planting ceremonies, lecture meetings, forest education for kids, the publication of serial picture story books on Japanese forestry, and so on. MORIMORI permits the inclusion of male members, and many supporters of civil residences have been welcomed.

4.2 Organization of women's forestry study groups and their activities

A forestry study group (FSG) is an organization that carries out activities to improve the technology and management of afforestation on a voluntary basis. Its members are forest owners, forest workers, and those interested in forestry. As of 2011, there were 1,335 such groups with a total of 23,972 members; 130 of these groups are composed of only women, and 330 are mixed-gender groups. The total number of female members is 3,513, which comprises 15% of the total (National Forestry Studies Group Liaison Council Conference on Women, 2011). Unlike a forest owners' association, forest ownership is not a requisite for FSG membership, so a woman engaged in forestry (including non-timber forest products) as a family worker can be a member. Many women's FSGs were formed through prefectural forestry extension services and have been established in various regions since the 1970s. In 1997, the Liaison Council Conference on Women was established within the National Forestry Studies Group, and it conducts nationwide exchange meetings on a regular basis.

Kimura (2005) investigated the activities of women's FSGs in Yamaguchi Prefecture, where many women's FSGs were established. The study showed that the contents and purposes of their activities differed depending on their time of establishment. The groups founded in the 1970s mainly aimed to hold study meetings for the improvement of forestry technology among their members. Since the 1980s, however, their purposes have been the utilization of unused forest resources, such as plant dye, vine craft, and bamboo charcoal, with a focus on interaction among peers in and beyond the area. The study suggested that women's FSGs had the potential to provide business opportunities in rural mountainous areas as places where peers with similar interests could get together regardless of their territorial settlement. It was also suggested that the center of their activities were members aged 50 or over, and that there were gaps in the awareness of forestry and aging society among the generations. The difficulty of generation change was also pointed out.

We have conducted a case study of Saga Women FSG, which is trying to overcome these challenges in the Fuji-machi district of Saga City in Saga prefecture, an area of small-scale forest owners whose average forest area is less than 5 ha. In 1996, Saga Women FSG was established by 72 women who had married forest owners and practiced planting and weeding in their family forests as wives. Their catch phrase has been, "Let's be mothers who can talk about the importance of forests and be cheerleaders for our husbands, who take care of the forest." So far, they have promoted the following activities in cooperation with forest owners' associations: 1) study meetings on forest and log sales, 2) study meetings on mushroom cultivation methods, 3) forest education for children in the region, and 4) forest projects for carbon fixation. Moreover, in order to encourage thinning, they visited 204 households (2008-2010). As a result of a municipal annexation, Fuji Town became a part of Saga City, extending along the Ariake Sea. After this annexation, urban women living near the downstream areas were encouraged to become members, leading to an increase in the number of members, from 72 in 1988 to 86 in 2010. Saga Women FSG has conducted a survey to raise awareness of the forest among urban residents of Saga City, and is planning activities that involve the cooperation of people in both the upstream and downstream areas.

Some members of Saga Women FSG who live in same community began to run a restaurant, using local ingredients, as a branch activity of the FSG in 2009. They serve vegetable dishes such as fritters (*tempura*) prepared from wild edible plants, and the restaurant has been gaining popularity among urban customers. This restaurant means a lot to women in this rural mountain area as a source of income. It is expected that a basis for income, if any, can be handed down to women who have finished raising children, or to women who have retired. This kind of activity offers the opportunity to reveal that timber is not the only benefit of forest resources, but there are many other blessings provided by the forest. The group representative, Ms. N, said that she was proud that they could provide healthy vegetable cuisine using local ingredients in order to convey the importance of forest and rural mountain communities to other people, especially to urban youth. According to her, the men in their community were skeptical about the restaurant at first, saying, "What a shame to make money with dishes prepared from wild edible plants." However, they began to support the women's activities and have come to understand them better.

In the 1980s, women in rural mountain communities (mainly the wives of small forest owners—the mothers of their communities) established women's FSGs at a community or a municipal level so that they could improve forestry techniques and develop and sell their processed products.

4.3 Networking and activities of female forestry technical personnel in prefectural governments

The Ladies' Network 21 for the Creation of Wealthy Forests was established in 1993 by female forestry technical personnel in prefectural government offices at the national level. At that time, there was an increasing trend in the number of female graduates majored in forestry-related sciences in universities, as already stated. The establishment of this group seemed to be motivated by a desire to exchange experiences regarding the roles that female personnel could fulfill in their prefectures. Their catch phrase was, "Let's provide a breath of fresh air into the forests, forestry, and mountain villages." Their activities have implemented suggestions of stylish work clothes for women as well as information exchange regarding the workplace environment and annual workshops called "Women's Forest Forums."

However, with the generalization of the existence of female forestry technical personnel, the significance of activities run only by women might be decreasing. The number of members has declined from 436 in 46 prefectures in 2001 to 376 in 38 prefectures in 2013. Under the circumstances, Ladies' Network 21 is currently seeking new roles and activities, such as expanding networks with other women's groups, including Forestry Girls @, and so on (Kimura, 2012).

4.4 Expansion of "Forestry Girls @" groups and features of their activities

In contrast with the networks established before the 2000s, which were organized by members in similar situations or in the same work position, the recently emerged women's network called "Forestry Girls @" (FG@) is a loose network of young women in their 20s and 30s with various occupations, using social network system, whose characteristics are to be introduced here.

In July 2010, Forestry Girls @ Kyoto was born. In only three years, the regional organization has spread widely at the prefectural level, to Shizuoka, Gifu, Tokyo, Tochigi, Ehime, and Nagasaki.

The core members of FG @ Kyoto were female students at Kyoto University and Kyoto Prefectural University who were majoring in forest-related sciences. They also involved other women, such as workers in a forest owners' cooperative association, architects, technical staff in a prefectural government office, women forest owners, women who love mountain climbing and wood, and so on.

They wanted to use the Forestry Girls @ name as a trigger "to expand the horizons of forestry and to lower the threshold of forestry" (Iwai, 2012). Therefore, they accepted a wide range of young "girls" as members, from professional forest workers to urban females with an interest in wood. The features of FG@ were expressed in the motto of FG @ Shizuoka: "We will extend attractive forestry, beautiful Japanese forests and their challenges through the eyes of 'girls' toward urban 'girls.'" The activity was a focus on moving "from 'girls' to 'urban girls.'" Specific activities include the publishing of a free paper in a shocking pink color that is aimed to appeal to "girls"; holding discussion events on urban coffee made from domestic timber; bringing tour events to forestry areas; and transmitting event information through blogs and Facebook. These activities are all run by women in their 20s and 30s who represent themselves as "girls" (*joshi*).

It was thought to be a strategic vision. The Japanese word *joshi* of Japanese contains a nuance different from the English words "woman," "female," or "girl," as *joshi* is usually used to refer to women when it is necessary to distinguish them from their schoolmates in education. *Joshi* is a word used to describe wisdom and purity. Thus, the activities of FG@ can easily achieve acceptance in Japanese society.

We have not yet been able to estimate how FG@ activities could influence Japan's male-dominated society. However, the author expects that they are storing their energy and abilities for the future in order to change old social structures in the rural areas where they are based, as well as to change females' interests in urban areas. In addition, the creation of a large variety of new rural businesses through their cross-industrial exchanges is expected as well. Have I become overly committed to Forestry Girls @?

5 Conclusion and Discussions

In sum, as symbolized by the small proportion of female directors in forest owners' associations, which are cooperative unions of female and male forest owners, the status of women is very low in Japan's forest and forestry sector, where the traditional structure of the male-dominated society still persists. In this society, Japanese women have played a role in the procedure of tending plantation forests as family workers (wives and daughters-in-law). They have also conducted activities through forestry research groups and economic development projects in the area as "mothers of the community," and have supported their rural mountain communities. On the other hand, there is actually a possibility that women's participation will progress in the future, as seen in the increasing number of female students studying forest science, the growing number of female forestry technology staff, and newly developed activities by Forestry Girls @. There exists a large gap between the two, in which today's Japan lies.

When we look at the activities of women's groups in Japan, many groups have expanded in recent years using keywords such as "networking" and "connecting." Women's groups are expected to play a role in the promotion of the use of timber and non-timber products grown in the forest by means of networking across various industries and conveying the importance of forestry to urban women. In a situation where wood demand is sluggish, new business opportunities are expected, as seen in the expression, "promote wood use by utilizing women" (Forestry and Forest Products Research Institute, 2013).

When we look at the world, we can see that a significant change is occurring: the proportion of women has increased among the constituents of private forest owners in Europe and the United States. In addition, in developing countries, one of the major issues in community-based forestry is the granting of land tenure to women. In the case of the Norwegian Women's Forestry Council, a movement was started to acquire rights, claiming, "Women need forests and forestry needs women," and it increased the proportion of female forest owners and improved their management skills (Sato, 2012). Is not such a movement necessary in Japan? Or does it not suit Japanese society?

Indeed, such claims have rarely been made by women in rural communities. However, Japan's low birthrate and aging society are accelerating to an extent that could destroy the sustainability of family-run forestry management in the community, or even the sustainability of the community itself. On the other hand, more women want to be involved in forests and forestry, while some mountain villages also have more i-turn people, where urban residents move into rural communities. If we consider revitalizing communities through the acceptance of such people, the process of reviewing the issues of forestry and rural communities from a gender perspective will be indispensable from now on.

However, forest and forestry policy in Japan has heretofore pursued only the growth of timber production and its efficiency, while small-scale owners have been positioned only as a target to be "consolidated" (Sato, 2013). Overseas attention has focused on forestry work systems and mechanization, as well as the training of foresters. However, to cope with social and cultural changes to seek the expansion of women's participation in every field of the industry, many countries are trying to promote forest policy that increases women's participation in forestry management. Using the keyword "diversity," proposals have been made to expand women's rights of forest use and ownership, to seek suitable education and dissemination activities for those in need, and to consider relations with local communities.

By reviewing the issues of forests and forestry from women's viewpoint, the social structure of rural mountain communities will attract attention, which will require forest policy to develop as local policy so that diverse groups of people can be involved in the forest. As Hara and Ouchi (2012) state, "Recombination into better rural communities for women will lead to the realization of a society that is easy to live in for men, too." This is an essential challenge for the future of forests and forestry in Japan.

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[PL1-1]

Community-Based Forest Management from the perspective of organizational capability in rural Philippine society

HAYAMA Atsuko[1]

1 Introduction

The apparent failure to attain sustainable forest management in the vast state forestlands, both directly by the government and through logging companies as a concessionaire, in many developing countries has led to a forest policy reform that put state forestland management into the hands of local people.

In the Philippines, the policy of Community-Based Forest Management (CBFM) was proclaimed in 1995 as the national program for sustainable state forestland management as well as for rural development. Although nearly 20 years have passed since the implementation of the CBFM policy, its goals have yet to be realized. Many studies have discussed the causes of CBFM's poor performance, but none of them have focused on the "community" itself or specifically on the mechanism that organizes people living in a rural society. This study hypothesizes that CBFM's malfunction is attributable to the discrepancy between the organizational capability of rural Philippine society and what is expected of a development organization, i.e., communities formed by outside agencies for CBFM purposes.

2 Overview of CBFM in the Philippines: What is lacking in previous studies

2.1 Institutional setting for CBFM

In the forest policy of CBFM, local communities are expected to rehabilitate degraded forestlands and conserve remaining forests (Lasco and Pulhin 2006). This forest policy reform has widely been espoused as realizing participatory forest management (Utting 2000), democratizing local people's access to forest resources, and thus contributing to poverty alleviation (Guiang *et al*. 2001), as well as crafting space for local forest management (Contreras 2003). At the same time, entrusting state forestland management to local communities intended to eliminate *de facto* open access lands in the state forestlands and, thus, to lessen government administrative costs (Dalmacio *et al*. 2000).

The Revised Master Plan for Forestry Development of the Department of Environment and Natural Resources (the government office with jurisdiction over the state forestlands, hereafter DENR) wrote that out of 15.9 million hectares of total state forestlands (53% of the total land area), 5.7 million hectares were under CBFM in 2000 and envisioned that in total, 9 million hectares would be under CBFM by 2010

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(FAO/DENR 2003, p.158).

It is estimated that some 25 million people (more than 30% of the total population) resided in state forestlands in 2000, out of which some 6.3 million were indigenous people while 18.7 million were migrants (Guiang 2001, p.106). Indigenous people here means those who have long resided in the forestlands, even before they were nationalized, or in their so-called ancestral domains, while migrants are those who have settled in the logged-over forestlands after World War II.

In Section 4 of the Department Administrative Order (DAO) No. 96-29 defines 'community' as 'A group of people who may or may not share common interests, needs, visions, goals and beliefs, occupying a particular territory which extends from the ecosystem geographical, political/administrative and cultural boundaries and any resources that go with it'. In CBFM, local people are required to form an organization, that is, Peoples Organization (PO), which is defined in the DAO as 'A group of people, which may be an association, cooperative, federation, or other legal entity, established by the community to undertake collective action to address community concerns and need and mutually share the benefits from the endeavor.' One CBFM area covers one *barangay*, the smallest administrative village in the Philippines, or several barangays. When the natural forest extends to, for example, three barangays, these three barangays may form one community for CBFM. Several neighboring barangays where a donor-assisted reforestation project was established may also form one community. One community has one PO, which is a receiving organization of the CBFM Agreement (a sort of contract for legal resources use in the state forestlands) with the DENR and external resources.

As stipulated in the DAO, for a group of people to be legally recognized as a PO, they have to register as a legal entity with the government agency in charge. This is because, according to the DENR, it is the only way to guarantee the credibility of a group of people, to which the government can contact and grant the long-term land tenure. The majority of them are registered as a cooperative at the Cooperative Development Authority. Registration as a cooperative requires several qualifications specified by the Republic Act No. 6938, 'An Act to Ordain A Cooperative Code of the Philippines', such as organizing with at least 15 members, preparing bylaws and collecting capital share from members (minimum 1,000 pesos). Once it is registered as a cooperative, the PO (now cooperative) has to apply for a CBFM Agreement with the DENR by submitting several documents. These application documents are reviewed and checked at each level of the administrative organization of the DENR from local to central. Documents with deficiencies are returned to the PO. A CBFM Agreement is awarded to a PO only when the DENR Secretary approves it. This procedure alone takes a long time.

The latest Philippine Forestry Statistics shows that 1,790 POs covering aggregately 1.634 million hectares have been awarded with CBFM Agreements. The tenured area under the CBFM Agreement in 2011 is much smaller than the above-mentioned 5.7 million hectares under CBFM in 2004. Most CBFM areas have not yet been awarded such a privilege primarily due to a lack of financial and technical assistance needed to forge the agreement with the DENR. Without a CBFM Agreement, POs are not legally permitted to use forest resources, particularly timber production. Upon receiving a CBFM Agreement, POs have to prepare plans for the use of state forestland resources ('Community Resource Management Framework,' which is 'a strategic plan of the community on how to manage and benefit from the forest resources on a sustainable basis' and 5-Year Working Plan) with the assistance of the DENR Community Office, municipality office, and NGOs, and submit them to the DENR Community Office. Without the DENR's consent, POs cannot embark on their resources use activities. In 1,790 CBFM Agreement-awarded POs, one PO consists of 180 households, covering 913 hectares on average.

2.2 Previous studies on the ineffectiveness of CBFM

It is rarely stated that CBFM has been effectively enforced as envisioned by the government. It is frequently observed that POs' activities malfunction after external assistance ends at the sites. Many studies point out the various reasons for the ineffectiveness of CBFM. Pulhin *et al*. (2007, pp. 874, 876, 878) enumerate them as follows: (1) financial limitations for supporting CBFM due to a decrease in donors assistance since the early 2000s; (2) lack of adequate institutional support to provide benefits to local communities; (3) limited local governments' capability to provide support in extension, capacity building, and infrastructure to local communities; (4) insecurity in the right to resource use caused by frequent policy changes in timber production; (5) complex and tedious requirements and proceedings for local communities regarding timber production; (6) lack of income-generating activities and viable enterprises owing to the technically, managerially, and organizationally poor livelihood projects of POs; (7) local people's mentality regarding the CBFM Program as a project that terminates after the withdrawal of external assistance; (8) weak managerial capabilities with regard to, for example, accounting and bookkeeping, of PO members. Many studies have also criticized the government for retaining control over state forestlands by limiting the devolution of the right to use resources to local communities, which hampers the effective achievement of CBFM (Dalmacio *et al*. 2000; Gauld 2000; Pulhin *et al*. 2007, p.876; Guiang 2008; Chokkalingam *et al*. 2006; Suh 2012).

It can be seen in many studies that, in spite of these problems, CBFM could be properly implemented if CBFM policy design is adequately reformed and local communities are given sufficient time, support, and incentives. Many studies, thus, conceive that the performance of CBFM (dependent variable) is the function of variables such as policy, project design, support, and incentives (independent variables). The assumption here is that CBFM functions well when these variables are fully satisfied. Little attention has, however, been paid to community itself.

No attempt has been made to explore the characteristics of organizational capability in rural society. As Shigetomi (2011, p.24) articulates, local societies have their own systems for helping to organize people, on which their organizational capabilities depend. Organizational capability is defined as 'the capability for local societies for creating and managing development organizations' and, more specifically, 'the ability to shoulder the problem-solving process, which consists of understanding a problem process, planning process and implementation process, for creating organizations' (ibid pp.24, 25). This study hypothesizes that the fundamental cause of CBFM malfunction is not that policy, project design, support, and incentives are insufficient, as many studies suggest, but that there is a discrepancy between the organizational capability in rural Philippine society and what is expected of a development organization for CBFM purposes.

3 Characteristics of organizational capability in rural Philippine society

3.1 Migrant community in the state forestlands

This section examines how local social systems contribute to the formation of rural organizations in the Philippines. The focus here is, thus, to understand the self-organizational process of rural people. The study site for this purpose is Barangay El Salvador in the Municipality of New Corella, Province of Davao del Norte, Mindanao, in the southern part of the Philippines. Barangay El Salvador is a typical migrant community in the state forestlands, which was formed after World War II with those who spontaneously migrated into the logged-over area of commercial logging operations.

The entire barangay area (some 1,500 hectares) of El Salvador is within the state forestlands. Topographically, these forestlands are steep, rolling hills. Since settlements in the forestlands are formed in flat and gentle slope areas, they are some distance from each other. The size of the settlements in these forestlands is generally small. One barangay in the forestlands consists of several settlements. Barangay El Salvador comprises six *purok*s (subdivisions). Migrants spontaneously formed settlements one by one to a total of six before the area became a barangay.

The total number of households in Barangay El Salvador as of March 2007 was 240, out of which 233 were interviewed. The total population of 233 households was 1,052 (male 582, female 470). The biggest and smallest puroks are Purok 1 with 62 households and Purok 2 with 16 households respectively.

The characteristics of migrant settlements in the logged-over forestlands are based on blood relations. This is because the first migrants, most of whom were male, called their parents, siblings, and relatives to migrate. Many Barangay El Salvador residents are migrants from Bohol in Visayas region (central part of the archipelago) and Davao del Sur in Mindanao. Most newlywed couples reside in the husband and/or wife’s parents’ settlement. The majority of settlement residents are, thus, blood related or marriage related to each other, belonging to one kinship group. There are 40 kinship groups in Barangay El Salvador. The biggest kinship group amounts to 168 households (72.1%) out of 233 households and the second biggest amounts to only 11 households. The majority of barangay residents know each other. It should be noted, however, that local people do not identify a kinship group as an organization. As we will see below, a kinship group for an individual includes only several blood- and marriage-related relatives.

3.2 Endogenous functional organizations

Shigetomi (2011 p.26) classifies rural organization into four types based on two axes of function (‘achieving a specified target’ and ‘coordination and control of members’) and origin (‘endogenous’ and ‘exogenous’). We focus here on endogenous organizations with the purpose of achieving a specified target to examine the social system. Three endogenous functional organizations can be identified in Barangay El Salvador, that is, a mutual fund organization for funeral services, a mutual fund organization for wedding receptions and a fund-raising organization for food expenses in special occasions.

Mutual fund organization for funeral services (*dayong*)

The mutual fund organization for funeral services is locally known as *dayong*. *Dayong* is the oldest endogenous functional organization, operating in Barangay El Salvador since the early 1960s, when pioneer migrants from Bohol introduced it as their practice there. In urban areas and rural areas in the lowlands, it is common for local people to depend on a funeral business (undertakers) that has an office there. In the forestlands, on the contrary, local people can hardly depend on such a business.

A household as a unit joins *dayong*. When joining *dayong*, a member has to pay 100 pesos (daily wage for agricultural labor in the barangay is 150 pesos). The treasurer stores all the money collected from the members. When a family member of a member household died, the treasurer collects 100 pesos in kind (rice, canned goods, firewood, snacks etc.) from all the member households. All the money stored and these goods are then provided to the bereaved household. Moreover, all the member households are assigned roles such as to inform barangay members about the death, the purchase of food, cooking, cutting firewood, making a coffin and digging a grave. Absence is fined. Immediately after the funeral, all the member households are called to the assembly to pay 100 pesos, which are again stored by the treasurer until the next funeral. Two consecutive absences in the assembly are fined or result in a removal of *dayong* membership. Joining, withdrawal and rejoining are unrestricted. Joining is, however, allowed at the time of assembly held right after the funeral. A household who has a member at death's door is not allowed to join *dayong*. If a family member died when the household had not yet paid 100 pesos or withdrew from *dayong*, no service is provided to the household.

As of March 2008, there are four *dayong*s in Barangay El Salvador. The biggest *dayong* consists of Purok 1, 2 and 6 residents, amounting to 54 households. Other *dayong*s are 23 households in Purok 3, 25 households in Purok 4, and 17 households in Purok 5 respectively.

Mutual fund organization for wedding receptions (*gala*)

The mutual fund organization for wedding receptions, *gala*, was established when one resident who had single sons introduced it to Barangay El Salvador about 10 years ago. In the Philippines, it is custom that a bridegroom shoulders all the expenses for a wedding reception. *Gala*, thus, comprises only those households with single sons. While in *dayong*, withdrawal and rejoining can happen at any time, in *gala* the members are fixed when it is formed. Once a household has joined *gala*, withdrawal is not allowed.

As of March 2008, there are two *gala*s in Barangay El Salvador. One consists of 20 households including the resident who introduced it to the barangay, who are residents in all the puroks except Purok 3. The other *gala* consists of 15 households in Purok 3. Every time the marriage of a member's son is decided, 1,000 pesos are collected from all the member households. The 20,000 pesos and 16,000 pesos (one member pays for two sons) collected from the respective *gala* are given to the member whose son marries. *Gala* lasts until all the sons marry. If a son dies unmarried, the member households can get all the money from other members or use the money for another son. Even if a son and/or a member household leave Barangay El Salvador, they are still *gala* members.

Like *dayong*, all member households are assigned roles in a wedding reception, such as purchasing of food, cutting firewood, and cooking. Absence is also fined.

Fund-raising organization for food expenses in special occasions (*socio*)

Socio is a fund-raising organization for food expenses in special occasions. The practice of *socio* was introduced in the mid-1990s by a resident who had encountered it in other places in Mindanao. The purpose of fund-raising is to get sufficient money to buy foods for special occasions such as the fiesta (celebration of the patron saint of the barangay), Christmas and New Year's Day. It is their practice on such occasions to prepare a banquet and entertain relatives and visitors. Butchering a *carabao* (water buffalo) or a pig is considered the best banquet.

A *socio* is formed for an occasion in the following year and its duration is one year. For example, *socio* Christmas is formed in December for the next year's Christmas. *Socio* is formed to buy specific foods, for example, *socio bigas* (rice), *socio carabao* and *socio baboy* (pig). A proposer recruits members and forms a *socio*. Every member contributes the same amount of money, for example, 500 pesos. All the money collected is loaned to *socio* members with a monthly interest of 10% (simple interest) and to non-*socio* members with a monthly interest of 15% (ditto). All the money collected from the *socio* members is loaned out and no money remains with them. When loaning to a non-*socio* member, a *socio* member should be a comaker. 1,000 pesos loaned to a non-*socio* member turns into 2,800 pesos after one year. With the augmented money, they buy a planned item. The purchased item, such as *carabao*, pig, or rice, is equally divided among the *socio* members. Since local people need loans, according to *socio* members, *socio* has no difficulty finding borrowers. Once delinquency happens, however, *socio* fails.

As of March 2008, there are 12 *socio*s in Barangay El Salvador, participated in by 67 households (an aggregate of 150 persons). The biggest *socio* consists of 42 persons, while the smallest one consists of 3 persons. The average is 11.7 persons. The big *socio* mainly comprises close blood related members (parent-child and/or siblings) and/or married couples. Many of the same *socio* reside in the same purok. Among the 23 households of the biggest *socio*, 20 of them reside in Purok 4. Among the 12 households of the second biggest *socio*, all reside in Purok 6.

3.3 Characteristics of endogenous functional organizations

As we observed, no endogenous functional organization exists to mobilize all the barangay members, in spite of the fact that the majority of barangay residents belong to one kinship group and they all know each other. No endogenous functional organization exists to mobilize all the purok members either.

Two common characteristics can be found in the three endogenous functional organizations.

One is that all are small organizations bound with close dyadic relationships. Three endogenous functional organizations are formed among purok-based or settlement-based people, that is, a small social group of blood-related people and people with common ties to a place.

Close dyadic relationships guarantee one's credibility. In *gala* and *socio*, a proposer permits persons whom he/she trusts to join the organization. In this regard, these organizations are membership organizations founded on the close dyadic relationships of a proposer. In *socio*, when a member's treacherous behavior, such as his/her delinquency or failure to observe his/her responsibility as a comaker when a non-*socio* member fails to pay back the loan, appears, the proposer never invites him/her to his/her socio again. Once he/she loses his/her credibility, no *socio* proposers would invite him/her into their *socio*, which is a heavy sanction to local people.

Since each purok is located at some distances from the other, close contact with other purok members is not frequent. In this circumstance, a functional group founded on close dyadic relationships is in due course small.

The other characteristic of three endogenous functional organizations is that they are all short-term resource pool organizations. In *dayong*, all the money collected by the members is pooled by the treasurer until the next funeral of a member household. At the time of a funeral, all the pooled money is given to the bereaved household and, then, becomes zero. After the funeral, money is again collected from all the members and pooled by the treasurer. The period of the money pool is, thus, only until the next funeral. In *gala*, money is collected from the members right before the marriage of a son of a member household is decided. Since all the money collected is immediately given to the bridegroom household, the period of money pool is almost none. In *socio*, the period of the organization is exactly one year. Since all the money invested by the members is loaned, the money pooled by *socio* groups is always none.

The longer an organization pools money, the bigger the management cost becomes and the bigger the possibility of deviation or embezzlement by members becomes. By making the period of pooling money short, they can curb the management costs as well as the possibility of deviation by members. By shortening the money pool period, rural local society enables endogenous functional organizations to continuously function.

To increase the profit from organizing collective action, rural local society tries to reduce the organizational costs such as the cost of credibility inquiry for would-be members, the cost of consensus making among members and the cost of management of pooled resources. Close dyadic relationships centering on one individual reduce the credibility inquiry cost for would-be members and the consensus making cost among members recruited by him/her. Moreover, making the period that resources are pooled short can lessen the management cost of pooling them as well as curb deviation by members. In other words, it is also deduced that rural local society cannot control local people's behaviors over a longer period, which is the organizational capability of rural Philippine society.

4 Malfunction of the CBFM development organization: Discrepancy with the organizational capabilities of rural society

We extracted the characteristics of endogenous functional organizations in rural Philippine society, that is, utilizing the social system of close dyadic relationships and forming short-term resources-pool organizations. We see here that these characteristics do not correspond to what is expected of a development organization or the PO for CBFM.

The PO for CBFM in Barangay El Salvador was organized to sustainably manage the total land area of the barangay. A few years after the PO started timber production, the operation of the PO malfunctioned.

The planned sustainable timber production under the PO had not been achieved.

In 1988, the ADB/JBIC (then OECF)-funded contract reforestation project started in the country. Barangay El Salvador was one of the project sites. Most of the barangay residents took an active interest in the project, since the project had explained to pay contractors if they planted and maintained trees during the three-year contract period and they would be able to harvest these trees to sell when trees are matured. The whole barangay area, in spite of being state forestland, is practically owned by individuals. As the reforestation project contractors, they planted trees (all fast-growing species) in their claimed lands. Nearly half of the barangay area was planted with fast-growing trees.

After the concept of CBFM was introduced by the DENR Community Office to Barangay El Salvador, a PO was formed by a DENR-appointed NGO. In 1998, the PO was registered with the assistance of the NGO as the El Salvador Farmers and Tree Planters Industrial Cooperative (ELFATPICO) at the Cooperative Development Authority. Again, with the assistance of the NGO and the DENR Community Office, ELFATPICO was awarded the CBFM Agreement by the DENR to legally use forest resources. Despite the fact that the majority of households in the barangay had been engaged in contract reforestation and planted trees in their lands, only 35 households, about 17% of the then total households, jointed ELFATPICO. They were those who could afford to pay the capital share of 1,200 pesos. Moreover, most of the barangay residents did not feel the necessity to join FLFATPICO since anyone, even non-ELFATPICO members, could harvest their planted trees to sell.

With the help of the DENR Community Office and the NGO, ELFATPICO prepared the state forestlands resources use plans. Timber production started in 2003 when the Resource Use Permit, which is the timber production right issued by the DENR to CBFM Agreement-awarded POs, was issued to ELFATPICO. If timber production had operated in accordance with the plans, many of the reforested trees would still exist in the barangay. Instead, most of the reforested trees were harvested in a short period.

The direct cause of the malfunction of ELFATPICO is that it could not control residents' behaviors, especially in timber harvesting. In CBFM, it is ELFATPICO that has the exclusive right to harvest trees in the barangay area and sell timber. In reality, however, many middlemen came to buy directly from the owners of trees. The majority of the owners of trees cannot afford to shoulder harvesting costs such as hiring laborers for logging and hauling. The owners of trees asked either ELFATPICO or middlemen to harvest for them. It did not matter to them who harvested and bought the trees as long as they could sell them high. ELFATPICO could not control the influx of middlemen. The resources use plans soon became void, only for most of the reforested trees to be harvested in a short period.

Later it was revealed that a large sum of money had been embezzled by the ELFATPICO chairman (who was elected by all the members at the assembly meeting). The treasurer and the bookkeeper (who were appointed by the chairman) were aware of it but kept silent from fear of being discharged by the chairman.

The malfunction of ELFATPICO is not an exceptional case in CBFM. Rather it is one of the typical PO malfunctions in CBFM. The fundamental cause of the malfunction of the PO is not a policy design problem, insufficient support, or frequent changes in forest policies, as many studies suggest, but the discrepancy between the organizational capabilities of rural local society and the expectations for a PO. It is expected that the PO mobilizes all the barangay residents for sustainable forest resource management, sustainable timber production in particular, and make use of the capital it produces and pools it for rural development.

It is expected, thus, that the PO in the form of a cooperative will continue to manage and control local people and capital for a long period of time. The characteristics of endogenous functional organizations in rural society we have described in the previous section do not correspond with the nature of the PO (i.e., a small group based on close dyadic relationships vs. a big group covering the entire barangay, or sometimes extending to several barangays, and short-term resources-pool organization vs. long-term resources-pool organization).

5 Conclusion: Organizational Capability in Rural Philippine Society

The study was prompted by the research question why the CBFM malfunctions despite outside agencies' efforts to enhance it. Understanding the organizational capability of rural Philippine society is necessary to determine the fundamental cause for CBFM's malfunctioning.

As we observed, rural Philippine society has the capability to form organizations that are based on the social system of close dyadic relationships and that pool resources for a short period of time. This type of organization can reduce organizational costs by decreasing would-be members' credibility inquiry costs and consensus-making costs, to which the social system of close dyadic relations contribute, and resource management costs by pooling resources for only a short period of time, resulting in making the organization profitable. The social system of close dyadic relations naturally renders the size of such organizations small. We have not encountered any endogenous functional organizations that cover all purok residents or all barangay residents, even in the barangay where the majority of people belong to the same kin group and know each other. Development organizations formed by outside agencies can function only when they correspond to the above-mentioned organizational capability in rural society.

We focus on two characteristics of organizations in rural Philippine society, that is, member relationships and pooling resources periods. The former axis has informal relationship and formal relationship. Informal relationships use the social system of close dyadic relations, in which individual and personal relationships are crucial to make organizations function. Conversely, formal relationships do not use the social system. Instead, group relationships based on formal rules are crucial to making the organization function properly. This is because rural Philippine society has no social system, other than dyadic relationships, to mobilize people and control their behaviors. The latter axis has short-term resources and long-term resources pools. There are three types of organizations observed in rural Philippine society, that is, 'informal relationship and short-term resources pool' type (Type A organizations), 'informal relationship and long-term resources pool' type (Type B organizations) and 'formal relationship and long-term resources pool' type (Type C organizations). As we have discussed, Type A organizations are predominant in rural Philippine society.

POs or development organizations formed by outside agencies for CBFM to cover a barangay or bigger area require significant mobilization. The sustainable management of state forestlands, including profiting from timber production for rural development, requires long-lasting organizations that pool resources over a significant period of time. POs, thus, should be Type B or Type C organizations. Rural Philippine society hardly has the organizational capability to form Type B and Type C organizations. The majority of organizations in rural society remain Type A of a small size, using the social system of close dyadic relationships, as well as short-term resources pool organizations. It is apparent that development organizations that do not match the organizational capability of rural Philippine society will not last.

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[PL1-2]

How tenure insecurity formulates land market institutions in the limited production forest area in Tanjung Jabung Barat district, Jambi province, Indonesia

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Abstract

This research focuses on the impact of property rights' insecurity that drives tenure insecurity as well deforestation and forest degradation in the limited production forest (*hutan produksi terbatas*/HPT) in Tanjung Jabung Barat district, Jambi Province, Indonesia. Deforestation is considered as a risk management strategy; tenure insecurity reduces the present value of forest and fosters forest conversion into agricultural lands—in this case convertion into oil palm and rubber monoculture and rubber agroforest plantation. Moreover, deforestation is the consequence of strategic interactions between the local community (which has a claim over land and forest) with the migrant community (which is hungry for land to gain capital increment). This strategic interaction has driven the formulation of an informal land market institution and effected the local tenure arrangement that has significantly contributed to deforestation over the study site area. The current situation of forest land encroachment is the result of the lack of forest governance at the site level in which the state forest zone is considered more as an open access area or no-man's land. The research tried to get a better understanding on how the informal land market institution had been formulated at the study site area.

Keywords: tenure insecurity, local community, migrant, land market, deforestation.

1 Introduction

There are 9,103 villages in and around forest areas based on the identification of villages by the Ministry of Forestry in 2009, (Ministry of Forestry, 2009). From the data, the level of dependence of communities on environmental products and services from forest can be estimated. Community needs for land also eventually make people inevitably move into the State forest area to meet the needs of everyday life. Communities with a variety of levels of status and social institutions will claim forest land, which leads to the conversion of the area to be used as farm/plantation.

The rampant conversion of forest to other uses adds to Indonesia being in the world spotlight associated with a weak forest governance-level footprint that ultimately results in the forests in many countries being considered as "no-man's land" or an "open access area". There is a high level of interest by

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many people, including local communities who view the oil palm plantations as a threat to the forest cover and land in areas that are considered as open access areas. In addition, the perceptions of people living in and around forests to those forests also encourage people to flock to claim the forest land in order to obtain the same opportunities for personal utilization of the forest area.

The oil palm cultivation boom started in the early 1990s. At first, oil palm plantations were built only by large enterprises and were generally integrated with the transmigration program to get the workforce. Transmigration program participants are generally dominated by Javanese ethnics who come to a transmigration area with tenure arrangements that are relatively different to the pattern adopted by the local community. In line with the expansion of oil palm plantations, the lifestyle of the transmigration participants is changing to be more sustainable compared to the local community. With a relatively more sustainable life, there arises a desire to increase capital ownership (land capital). However, to get new land is not easy for them because they are immigrants who do not have other land claims except the land which was specifically allocated to transmigration participants amounting to less than 2 hectares per family .

To meet the demand for new arable land, the migrants eventually buy forest land claimed to be owned by local communities and these recurring events have significantly contributed to the deforestation rate in the study sites. Informal land markets not only occur among migrants with local communities, but also between local communities and spontaneous migrant communities who have migrated independently and are not part of the transmigration program.

Therefore this research sought to determine how the form of migrant communities' tenure arrangement (spontaneous migrants and transmigration participants) interacts with the local community tenure arrangement that formulates the informal land market institution. In addition, this research also tried to determine what has caused the slow process of HTR development in Tanjung Jabung Barat district, Jambi province.

2 Method and theoretical framework

The research was conducted in an area of limited production forest (*Hutan Produksi Terbatas* - HPT) of approximately 41,000 hectares in Tanjung Jabung Barat district, Jambi Province. To obtain qualitative data, this study was also conducted in four villages that served as sample villages, namely, Lubuk Kambing and Lampisi villages that are part of the Renah Mendaluh sub-district as well as the villages of Lubuk Bernai and Suban that are part of the Batang Asam sub-district.

The data and information collected in this study include primary data/information obtained directly from the field and secondary data. Primary data were obtained through focus group discussions (FGD) and interviews with key informants—the traditional leaders, village officials, farmers, youth leaders, officials of the District Forestry Office and District Development Planning Agency—as well as by observation in the field related to the topic of the research. Secondary data were obtained through library searches or literature, documents and data/spatial information.

Arnot et al. (2011) stated that the security of property rights, or tenure, is central to the economics of development and is recognized as important for the adoption and implementation of sustainable forest management. Further, Arnot et al. (2011) in his research tried to develop the definition of tenure security based on previous studies as presented in the following table:

Table 1. Definitions of Tenure Security Used in Previous Literature

Authors	Definition of tenure security
Feder and Onchan (1987)	Legal title to land
Feder, Onchan and Chalamwong (1992)	Uncertainty over changes in government policy
Holden and Yohannes (2002)	Perceived probability of losing ownership of a part or the whole of one's land
Otsuka et.al. (2001)	Probability of retaining rights
Owubah (2001)	Confidence in rights
Place and Otsuka (2000, 2001, 2002)	Probability of losing land rights
Robinson (2005)	Uncertainty of land rights
Sjaastad and Bromley (1997)	Perception of likelihood of losing a specific right
Sjaastad and Bromley (2000)	Risk of losing rights and perception of that risk
Smith (2004)	Assurance of rights

Source: Arnot *et al.,* 2011 (modified)

From the various definitions above, many instruments have been used to measure the level of security or insecurity of a right. Among them are: (1) whether there is certainty over rights (land) in the form of a certificate (legal title to land), (2) whether there is likely to be an expulsion/eviction from the land and (3) forms of tenure applied by the community and so forth.

Arnot et al. (2011) stated that security of tenure is certain to be different in every place and under different conditions. For example, tenure is likely to be the most secure when a person holds a certificate of ownership of the land (legal title to land). But other places may not necessarily have legal recognition of ownership of the land through a certificate or other definite measures to ensure the security of tenure. Deacon (1994; 1997) in Arnot et al. (2011) states that the certainty of legal rights is not always positively correlated with security of tenure. Even though there is certainty of legal rights, through formal means recognized by the State, if there is instability within a State, it is not impossible that in the end the right of ownership may be unsafe.

There are many who argue that the activities of transmigration are a government program and spontaneous migration contributes to deforestation of a forest area. The first question that must be answered in this case is how the migrants can actually get access to forest land through land purchase (Koczberski et. al., 2009).

Several studies in Indonesia have also documented that the process of buying and selling land/forest to the migrant farmers is for the benefit of establishing plantation commodities such as cocoa in Sulawesi and oil palm plantations in Sumatra (Ruff and Yoddang, 1999; Elmhirst, 2001; Li, 2002 ; Potter and Badcock, 2004 in Koczbersky et. al. 2009). Furthermore, Li (2001) in Koczbersky et. al. (2009) explains that the process of buying and selling communal land is an indirect result of the uncertain legal status of customary land which has enabled village headmen with authority in land matters to effectively dispossess customary landowners.

3 Results

3.1 Deforestation and land-use change dynamic in limited production forest

Based on data released by the District Forestry office of Tanjung Jabung Barat, the total forest area in the district amounted to 246,601.70 ha, or 49.2% of the total area of the administrative district (500,982 ha). From the above table, it can be seen that the area of limited production forest that serves as the focus of this research is an area of 41,995 ha which is the forest area in Tanjung Jabung Barat established by the Ministry of Forestry and Plantations decree No. 421/Kpts-II/1999 regarding the determination of the forest and water area in Jambi province. This area historically was the forest concession area of PT. Hatma Hutani.

The current conditions in the limited production forest area are very worrying. More than a third of its area has been converted into smallholder cropping. Limited production forest based on the "no man's land" perspective has resulted in most of the territory being converted into rubber and oil palm plantations. Most of the conversion that has occurred in the northern and southern area of the limited production forest zone is mostly in the administrative area of the villages of Lubuk Kambing and Suban.

Based on spatial analysis (Agung, 2012), the total forest area in 1990, 2000 and 2009, respectively, was 37,576 ha, 35,382 ha and 30,994 ha. The loss of forest cover in the period 1990–2000 amounted to 2,194 ha, while in the period 2000–2009 it amounted to 4,388 ha indicating that the deforestation that occurred in the period 2000–2009 (487.6 ha per year) was greater than that which had occurred during 1990–2000 (219.4 ha per year).

Deforestation increased in the period 2000–2009 due to the increase in conversion to plantations such as oil palm and rubber. Deforestation that occurred in the period 1990–2000 increased due to the high levels of migration to villages nearby the limited production forest zone. With the high rate of migration, the need for land is definitely going to increase as well.

The land-use change dynamics involve predominantly a change from forest to rubber monoculture, rubber agroforestry and oil palm plantations. Accordance to Agung (2012) stated in the period 1990–2000, there was a change from forest to oil palm plantations covering an area of 986 ha, from forest into monoculture rubber plantations of 203 ha and from forest to rubber agroforestry of about 894 ha. The total conversion into plantation during this period amounted to 2,083 ha or 95% of the total deforestation that occurred in the same period.

In the period 2000–2009, the forest conversion into oil palm plantations amounted to 1,408 ha; from forest to rubber monoculture amounted to 2,019 ha and from forest to rubber agroforestry amounted to 1,262 ha. The total conversion into plantations during this period amounted to 4,689 ha or 84% of the total deforestation that occurred in the same period.

Conversions from forest into small scale plantation areas in the period 2000–2009 nearly doubled when compared with the change from forest to small scale plantation in the period 1990–2000, namely, up from 2,083 ha to 4,689 ha. It was caused by the high rate of deforestation that occurred in the period 1990–

2000, where many primary forests that were already degraded were converted by the local community to oil palm and rubber plantations.

3.2 Land tenure arrangement

Local community

At first, the villagers of Lubuk Kambing, Lubuk Bernai and Suban acquired land by way of a claim to the land and forest. The interviews showed that land/forest claims were undertaken because at that time there was ample land available around the village. Claims were very closely related to the area of the village and the population density at that time. Accordance to Demsetz (1967) and Feeny (1993) in Ostrom (2000), where the population density is extremely low, land is abundant, and land generates a rich diversity of plant and animal products without much husbandry.

The different ways used to obtain the land for the local community people of the three villages were usually initiated by shifting cultivation activities. Shifting cultivation at that time was the ultimate way to make a claim and get the recognition of land/forest. Claimed land/forest was distributed and recognized by *"Pesirah or Rio"* as head of the village. Angelsen (1999) reporting on the results of research done in the district of Siberida Riau found that the activities of traditional shifting cultivation allow farmers to obtain land from the forest for the use of the individual, and tenure was then earned in accordance with customary law.

At that time there were rules governing land/forest claim areas that were used for shifting cultivation. People who managed shifting cultivation always managed their land. The regulation stipulated that a person will lose the right to manage and have control over the land if it has not been cultivated/managed for a period of more than three years. This rule can be found in the villages of Lubuk Kambing and Lubuk Bernai, but this rule is not longer applicable because there is no shifting cultivation undertaken by the villagers now and also all the land is now fully owned either individually or communally. This rule is often referred in the local community in terms of *"hutan gilir"*.

To state a claim against an expanse of land that is already owned and managed, local communities especially in Lubuk Kambing and Lubuk Bernai do so by planting cash crops such as rubber. With rubber planting, a land claim will be strong and will be recognized by other people. With this pattern over time, the local people began to abandon shifting cultivation.

Another way to make a claim over land is to open up plantations around the concession area. The concession area which is equipped with facilities and access roads was used by local communities to obtain a new claim to the land/forest. Logging activities and deforestation are closely linked to road access. Logging can facilitate deforestation with the influx of people to the area due to the logging road also used to open up general access to the forests (Kaimowitz et al., 1998, in Kanninen et al., 2007).

Initially before opening the plantations, the local communities cut down the existing commercial trees within their claimed land and sold them to the wood skipper—an activity known by the villagers of Lubuk Kambing, Lubuk Bernai and Suban as *"bekayu"* or *"bebalok"*. Once the timber had been sold, they cleared the land and started planting.

According to the people of Lubuk Kambing, Lubuk Bernai and Suban, in the past everyone was free to make a claim over land/forest and to then convert the land into crops/plantations. All that was required was to seek approval from *"Pesirah"/"Rio"* as the customary or village leader at that time. In the early 1990s, the people in these three villages started to plant rubber on their claimed land. In some places in Indonesia, rubber is a champion plant chosen by farmers if they want to change their cultivation pattern. Angelsen (1995) conducted research in Riau and found that the traditional community way of farming at that time was by shifting cultivation and gathering forest products, but in the last century this has been replaced by planting rubber and combining it with their shifting cultivation practice.

According to the villagers of Lubuk Kambing, the widespread rubber planting in ancient times can be proved by an old rubber plantation that is still easily found surrounding the village area. This land is now granted to the children and grandchildren of Lubuk Kambing, Lubuk Bernai and Suban villagers. Some of these lands have legal title but some areas cannot be legalized due to its land status being within the state-owned forest area.

Spontaneous migrants

Rubber and oil palm plantations in the villages of Lubuk Kambing, Lubuk Bernai and Suban are not only cultivated by local communities. Spontaneous migrants who come to these villages have a primary goal to purchase land/forest from the local communities and to plant it with rubber or oil palm. For example, in the village of Lubuk Kambing, migrant communities have come from several ethnics groups such as the Javanese, Batak, Palembang and Aceh, and these migrants plant rubber more extensively than oil palm. Contrary to Lubuk Kambing, the spontaneous migrants in Lubuk Bernai and Suban villages plant more oil palm than rubber. In Lubuk Bernai village, most of the spontaneous migrants are of Javanese ethnicity whereas Batak ethnics constitute the majority of migrants in Suban village.

To obtain land, these spontaneous migrants must buy from the local people who want to sell their land or plantation. Some of the land purchased from the local community already has a legal title and some if it is a part of state-owned forest does not and this is sold by the local community as well. The price of land/plantation that has a legal title is far more expensive than the price of forest land.

Transmigration

From interviews with the Lampisi villagers, it is known that the distribution from the resettlement program provided them with land equal to 2 ha for oil palm plantations and 0.25 ha for a house and its yards. The land distributed to these transmigration participants is covered by a legal process with a legal land title provided for each household. Along with the development of oil palm plantations with the nucleus estate scheme with the large scale companies, the migrants' living standards continue to rise. With the rising standard of living, the migrants desire to raise capital in the form of land for increased oil palm plantations. Lampisi villagers, as well as immigrants from other villages, buy land from the local communities as described above.

There is a facility used by the Lampisi villagers to increase the area of cultivated land compared to other migrant groups. The Lampisi villagers could hypothecate their land titles (which are obtained from the transmigration program) to the bank to obtain fresh funds in order to buy new arable land.

Based on the results of the FGD, the Lampisi villagers determine which land/forest they would buy from the local community based on the proximity of the land/forest offered to their village. The form of the land was also a consideration of migrant peoples when buying —whether the land was in the form of plantation, shrubs or was still forest. However, based on interviews with key informants, the form of the land was not a great consideration, because it is only related to the price of land/forest. Forested land would be cheaper compared to land covered only in shrubs and bushes and would definitely be cheaper compared to land that had been cultivated (plantation).

Another way to get land/forest from the local community was through land sharing—in the local language it is called *"mawah"*—which was introduced by the Javanese ethnics. Local communities give some parcels of land to spontaneous migrants to manage, plant the land with oil palm, fertilize the land and undertake all other plantation management and all of the associated cost should be covered by the migrants (either spontaneous migrants or transmigrants). After five years, the land is then divided into two parcels, with one parcel belonging to the local people that hired the migrants to manage their land and the other parcel going to the migrants.

3.3 Tenure insecurity occurs in the area of limited production forest

In the process of selling land-forest occurs the risk sharing between the seller, buyer and witness on the activities that are considered illegal by the State. It can be seen from the land-forest market process that relies solely on a piece of receipts as the only trade document of a parcel of land-forest. Frequent land market process in fact detrimental to the buyer in this case is the migrant communities. Based on interviews with key informants, in order to obtain land-forest, migrant communities have to pay as much as three times to different local claimant as they have the same claim over the same parcel of land-forest. Basley et al. (1995) in Arnot (2011) stated that the uncertainty of tenure is a condition where there is the possibility (probability) the deprivation of land rights. This can be seen clearly in the study sites.

Migrant community perception of tenure insecurity over land-forest especially for Lampisi villagers when they buy land-forest that is counted as state owned forest there will be problem and risk of expulsion that could culminate to make them lose the rights to their land. Facing fears will lapse at a later time Lampisi villagers said that even if land-forest they purchase must be returned to the state, at least the land is already able to produce a minimum of one cycle of oil palm plantations. For local community who sell the state owned land-forest it is also found unsafe for them to manage the land by them self so that it will be better to them to sell it. This happens because the area is state owned forest which someday can cause legal problem related to the acquisition and utilization.

In addition, from interviews with key informants can also be concluded that with the process of land market provide economic benefits to local communities which made selling and purchasing of land-forest as a livelihood option for some people (village elite). This has led to land market increasingly prevalent and easy to do; besides there was indeed the demand for land in the presence of migrant communities.

3.4 Migration and formalization of informal land market institution

Tanjung Jabung Barat is one of the districts in Jambi province that is the target location for transmigration. Transmigration programs are generally integrated with the nucleus estate program (PIR) of a large scale oil palm plantation. Migration waves began to come to Tanjung Jabung Barat district in 1990 and successive waves continued in the following years.

In addition to the transmigration patterns, there were also spontaneous migration patterns by ethnic Javanese, Batak, Palembang, Aceh, Bugis and Banjar. Most of the people who migrated spontaneously were motivated by the desire to seek a better life than they had in their original home town by opening up a new plantation. Koczbersky et al. (2009), reported there was a lot of documentation by researchers of the phenomenon of buying and selling land/forests to communities of migrants for conversion into plantation.

The general desire to improve living standards and raise capital in the form of arable land (land capital) indirectly affected the pressure on the land/forest. Migrant communities were forced to buy land/forest due to their migrant status which made it impossible to make a traditional claim for forest/land. Trading land/forest is a right claimed by individuals/groups of local communities. Research conducted by Li (2002), explained that the privatization of land/forests by local communities became the foundation on which land/forest was developed into a commodity that could then be traded with the immigrant community.

The formation of informal market institutions of land/forest is a series of processes of interaction between local communities who have land/forest claims with immigrant communities. Transmigration communities that started to come in the early 1990s in fact were far more financially secure when compared with the local community, for if the immigrant's economy was more secure, then this created a motive to acquire new arable land.

The high demand for land did not necessarily just happen. The increasing need for land was affected by various factors such as the presence of the transmigration program which introduced the impact of certain agricultural commodities and technology. The transmigration program introduced new farming/agricultural systems and created new land market processes (Koczberski et al., 2009), where the migrants bought land from local communities. It is found in the village of Suban that the dominant commodity had shifted from rubber to oil palm plantations. The FGD results showed that a lot of rubber plantations had already been converted into oil palm plantations.

The land market institution is a series of processes of interaction between the land tenure arrangements of local communities with the land tenure arrangement brought in by immigrants. For example, in the villages of Lubuk Kambing and Lubuk Bernai, the *mawah* system is prevalent. The *mawah* system itself is a pattern of land tenure introduced by the Javanese and Bugis ethnics. To obtain new arable land in the villages of Lubuk Kambing and Lubuk Bernai, migrant communities (the majority ethnic Javanese) joined in the land sharing scheme when oil palm production began.

Furthermore, the *"hutan gilir"* pattern applied in the villages of Lubuk Kambing and Lubuk Bernai also has implications for the rampant land market. *Hutan gilir* basically determines the rules that govern the land use where the person will lose the right to manage and control a parcel of land/forest if it not managed for more three years. The right to manage and control will be passed to those who manage and control the remaining land. Furthermore, it also becomes the right of the next claimant to sell land that is generally covered by shrubs or planted with horticultural crops. After the land has been sold to migrants, the money then belongs to the new claimant and is sometimes shared with those who previously managed and controlled the land.

The sale and purchase of land/forest through a series of processes involves several parties that have their own respective roles. Parties associated with the process of buying and selling land/forest that can be encountered in the field include the buyer, seller, broker, trading witnesses (people who have a plantation that is directly adjacent to the garden which was sold, hamlet head and the village officer) as well as the village head.

3.5 Informal land market institution and its contribution to deforestation in the area of limited production forest

As already mentioned above the proliferation land market processes has resulted in a decrease of forest cover due to conversion of forest to oil palm and rubber plantations and contribute significantly to the high rate of deforestation. Rampant conversion of land-forest to oil palm, rubber monoculture and rubber agroforestry cannot be separated from the high economic value of the commodity. Widayati et al. (2011) stated that the high profitability of land use changes from forest to oil palm, rubber monoculture and rubber agroforestry is an important factor triggering the loss of forest cover.

Sofiyuddin et. al. (2011) in Widayati et. al. (2011) stated that of the three dominant land-use changes occurs in limited production forest, changes from forest in to oil palm plantations has highest value for the level of profitability of small farmers amounted $ 7.012 per ha. While the profitability rubber monoculture plantations amounted $ 2,417 per ha and rubber agroforest amounted $ 1.580 / Ha.

4 Conclusion

Informal land market formed by the high demand of land-forest by the migrant communities to increase their land capital meet with the supply from the local communities claim over land-forest that makes land-forest commoditization, where both migrant and local communities fully understand that their claim over traded land-forest is definitely insecure in term of tenure. Beside, with the passage of time, the land-forest trade through formalization of informal land market has become a livelihood option for local communities, especially village elite who exploit the lack of forest governance which makes state owned forest as if a no-man's land. The high profit of oil palm cultivation that felt by small farmers is also a trigger of formularization informal land market where this process significantly impact on the rate of deforestation.

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[PL1-3]

The role of civil society organisations in the development of community forestry in Asia-Pacific

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Abstract

The paper presents some of the key findings of a publication on community forestry (CF) in Asia-Pacific to be published by The Center for People and Forests – RECOFTC in November 2013. Research commissioned for the publication includes assessments of CF in 14 countries in Asia-Pacific. It generated a unique set of primary data on changes in the distribution of forest tenure and current advocates of CF. In addition, the research reviewed the existing literature on the governance and outcomes of CF on the ground and its national trajectories across the region. The paper presented here particularly examines drivers of CF on the basis of a stakeholder analyses conducted in the 14 countries. The analyses allows the examination of the institutional drivers of development of CF, and where these institutions, and their interaction, will likely steer CF in the future. This includes the key roles that central governments and civil society play. For example, the novel overlaps of interest and political coalitions between local communities and forest peoples' associations, on the one hand, and broader civil society concerns and movements at national and transnational levels, on the other. The future role of CSOs in the development of CF will be based not only on the pursuit of sustainable management of forests on national and sub-national levels, but will also draw on broader demands for the economic, political and human rights of people living in rural areas.

1 Introduction

Community forestry (CF) is often viewed as being the answer to the many challenges to sustainable forest management in Asia-Pacific. This is set against a backdrop of rampant illegal logging, and legally sanctioned clearing of natural forests for agriculture, industrial agricultural crops and infrastructure affecting many parts of the region. The basic premise of the key role that CF can play is built on the belief that those living in and around the forest are best placed to manage them in a sustainable manner. This is increasingly recognized by governments in the region as demonstrated by the fact that, as of 2012, communities possessed 34 percent of forests (31% in 2002), and that they hold strong tenure rights to 83 percent of this land (Sikor et al. 2013). There are, however, notable variations between countries with Papua New Guinea, the Philippines, and China being at one end of the spectrum and Bhutan, Cambodia, Indonesia, Malaysia, Myanmar, and Thailand being at the other.

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In addition to variability in the development of CF in the region there are also differences regarding its aims. Various stakeholders view CF as a vehicle moving towards different, sometimes mutually exclusive destinations including forest restoration, forest conservation and poverty reduction. The views of these stakeholders are especially important considering the role they have in driving the vehicle. To continue with this analogy one can say that some individuals, offices and ministries within national and sub-national governments are applying the brake and accelerator at the same time, the same could be applied to strategies and activities of other stakeholders such as civil society organizations (CSOs) and donor organizations.

The differing understanding of the aims of CF, are reflected in the (regulatory) environment in which CF operates (Gilmour et al. 2005). When communities get their certificate they face challenges to ensuring that the forest can make important contributions to their livelihoods. First, communities often find that governments have handed over tenure to highly degraded forests or barren land, thereby severely limiting the potential of CF to contribute to poverty reduction (Sunderlin 2006, Warner 2007). Secondly, communities find that they have limited active control in the management over their forest (Dahal et al. 2011). Only where communities have a degree of freedom in management will they then derive strong livelihood benefits from local forests. Where communities are more passive participants, participation in the protection of degraded forests typically generates negative impacts on their subsistence and/or cash income, with implications for illegal logging. This is particularly true where CF comes along with strict limitations on prior forest uses (e.g. customary uses and management structures), without corresponding compensation in terms of benefits from enriched forest resources or financial compensation.

A fundamental starting point when examining community forestry is understanding that the operating environment for CF in each of the countries in the region is determined by the positions of key stakeholders, hence the importance of examining their roles. One potential key stakeholder is civil society organizations (CSOs), as demonstrated, for example, by their influence on the activities of the pulp and paper industry with regards to interaction with forest communities and forest conservation in Indonesia (Gritten and Kant 2007, Raitzer 2008, Gritten and Mola-Yudego 2010), and their impact on strengthening human rights in the region (Cheema and Popovski 2010).

This paper will present a brief analysis of these key stakeholders, and will subsequently focus on the increasing role that CSOs play in the development of CF in the region. The aim of the analysis is firstly to improve the understanding of the different and fundamental roles that the key stakeholders play, and secondly to increase the awareness of the activities of CSOs in improving the rights of those living in and around forests, conserving forests, and protecting biodiversity. This will be achieved through analysis of 14 countries in Asia-Pacific (Bangladesh, Bhutan, Cambodia, PR China, India, Indonesia, Lao PDR, Malaysia, Myanmar, Nepal, Papua New Guinea, the Philippines, Thailand, and Vietnam). The information gathered was based on a literature review. In addition individual studies prepared by national CF experts in each of the 14 countries were specially commissioned for the work, these studies included interviews with key stakeholders in each of the countries.

2 Overview of stakeholder analysis

Through the co-option of Freeman’s (1984: 46) definition of stakeholder as “any group or individual who can affect or is affected by the achievement of the organisation's objectives”, one can identify 10 stakeholders that arguably play an important role in the development of CF in Asia-Pacific (Figure 1). These stakeholders have differing levels of support (or opposition) and influence with regards to the development of CF; this is determined by the environment in which they operate (e.g. level of freedom) and the interests and values of the stakeholder themselves.

The relationship between the different stakeholders must be taken into account when considering the roles, attitudes and level of influence in the development of CF. For example, CSOs rely a great deal not only on the central government regarding their legal position and the freedoms within which they operate, but also on other stakeholders such as media for raising awareness, research institutions for conducting work examining the fundamentals of CF, and donors for funding (e.g. over 80% of Asia Development Bank’s (ADB) approved grants in 2010, and related technical assistance included some form of CSO participation (ADB 2012)). Therefore, forward progress for CF is greatly dependent on a supportive environment among the key stakeholders.

Further analysis in the 14 countries finds that five of the stakeholders are critical for the development of CF in the region:

1. Local communities
2. Ministries responsible for forestry
3. Central government
4. International donors
5. Civil society organizations (CSOs)

Central governments and the ministries in charge of forestry possess a great deal of influence over the development of CF. Central governments invariably have powerful means to determine the environment in which CF operates, for example through transferring tenure rights to local communities as well as creating an enabling environment for them to exercise and benefit from these rights. Across the region, the position of central governments varies from direct opposition in some countries to full-hearted support in others. In Vietnam and China, for example, central governments have historically been key champions of community forestry, where national reforms have seen large-scale transfers of forestland to local communities. On the other end of the scale some central governments in some countries have effectively been significant barriers to the development of CF, for example, Indonesia, where the Suharto regime not only preserved state ownership of forests but also oppressed civil society activism on behalf of forest peoples. Some governments have perceived community forestry as being in direct opposition to national development strategies centered on agro-industries such as large-scale forest concessions and agricultural plantations.

Local communities and CSOs have generally strong interest in promoting CF. With a few exceptions, CSOs are broadly supportive based on the understanding that CF is a vehicle for community development, human rights, indigenous peoples, women’s rights, and good governance, which are the aims of many CSOs.

However, communities and CSOs have little influence on policies relating to forestry, including those that determine the operating environment for CF. Figure 1 presents an overview of the support and influence of the 10 stakeholders in the 14 countries.

3 Roles for civil society in enhancing community forestry

CSOs can play significant, though varied roles on national levels (i.e. more advanced in Nepal, the Philippines and Thailand, compared to China, Myanmar, Lao PDR and Vietnam), as well as at the sub-national level (Table 1). They include a wide variety of organizations ranging from grassroots-based membership associations (e.g. FECOFUN in Nepal) to consultancy-type organizations run by retired government officials, which seem particularly common in Myanmar , and internationally-networked advocacy groups (e.g. Forest Peoples Programme). The influence CSOs have is related to differences in national political systems, of which some enable civil society activity while others greatly restrict their ability to operate effectively (Lee 2004). Additionally one must also take into consideration the different levels of influence of national and international CSOs; for example, in Thailand national CSOs have played a more prominent role than international ones, while in Lao PDR the opposite is the case.

On the whole CSOs are generally very supportive of CF. However, some CSOs have offered vocal opposition to CF out of concerns over forest and biodiversity conservation. Examples of opposition include some groups from the Philippines and Thailand focused on biodiversity and forest conservation which have actively campaigned against the strengthening of CF in the belief that the best way to protect biodiversity was to remove people from forests with high levels of biodiversity (Novellino and Dressler 2009, Thawaron et al. 2010).

CF overlaps with the agendas of many CSOs, including those focusing on human rights, gender equality, indigenous peoples' rights, or good governance, the result of which is that there is a broad spectrum of organizations directly or indirectly advocating the development of CF. These groups also use different strategies to achieve their aims; ranging from capacity development (of various stakeholders to facilitate development of CF) and soft advocacy work (i.e. working with sub-national and national government partners, as well as regional governmental (e.g. ASEAN Social Forestry Network (ASFN)) and international organizations (e.g. the Food and Agriculture Organization of the United Nations [FAO])) to groups organizing demonstrations advocating for the protection of rights of forest peoples. While there is a great deal of coordination among many of these organizations (whether formally [e.g. through partnerships and networks such as the Rights and Resources Initiative (RRI)] or informally), there are also missed opportunities for maximizing the impacts. This is based on the understanding that in order for CSOs to maximize their impacts, coordination (regarding, e.g., activities, strategies) is crucial (akin to the blanket strategy presented by Gritten and Mola-Yudego 2010). However, one must also consider that these groups are also competing for funds. Nevertheless, the linkages between CF and CSOs working on related concerns can be strengthened further. This is partly based on the understanding that CSOs active in many fields can gain a great deal of understanding by exploring the multidimensional nature of CF better and making it an integral part of their agendas.

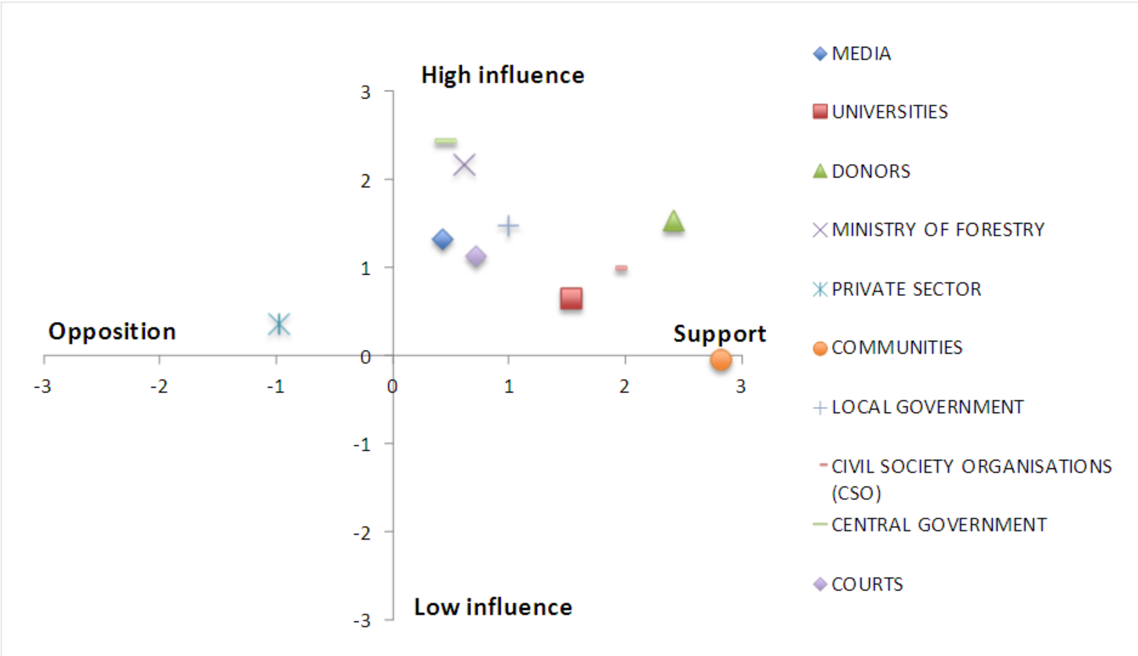

Figure 1: Proponents and opponents of CF in Asia-Pacific (Sikor et al. 2013).

Note: Both criteria are defined at a scale from -3 (no influence, strong opposition) to +3 (high influence, strong support).

Logging bans in many countries in Asia-Pacific often have detrimental impacts in the neighboring countries, invariably on forest communities. For example, the impacts of Thailand's logging ban introduced in 1989, was strongly felt in Cambodia, Lao PDR and Myanmar, with particular impacts on the Karen hill tribes (Contreras 2004). In China the 1998 logging ban saw significant increase in legal imports of logs (+210%), sawn wood (+62%) and paper pulp (+41%) in 1999 (National Bureau of Statistics, 1998-2000), again with large implications for the region and beyond, especially as a great deal of the timber was illegally sourced (Lang and Chan 2006). This highlights the importance of CSOs collaborating across borders, especially as the region increasingly becomes part of the globalization process. For example, Myanmar increasingly opening itself to foreign investment and Lao PDR's 2013 membership of the World Trade Organization (WTO) will likely create further opportunities for illegal logging. In order to combat this CSOs, working with government institutions, will likely need to collaborate on a regional level.

To return to the key point that CSOs can support CF in manifold ways: CSOs have traditionally not been considered a primary source of support for local communities managing forests due to their limited capacity and influence. The focus has been on the agencies in charge of forestry for their presumably strong capacity and high influence. However, CSOs already support CF and have a significant role to play in the further development of CF in the region (Table 1).

4 Conclusions

The concluding statement from this brief paper is that CSOs can gain a lot by supporting CF, just as CF can benefit greatly from the support of CSOs.

The principles behind CF often overlap with the interests of CSOs working in many fields. CF can serve the aims of CSOs working on such varied issues as economic development and adaptation to climate change, promotion of human rights, supporting indigenous peoples' rights, enhancing gender equity, aiming to conserve nature, and strengthening governance. CSOs in all these fields can gain a great deal by supporting CF and using CF as a platform for promoting multiple agendas.

CSOs can support CF in many ways. Even though their financial and human resources may be limited, they can assume important functions not carried out by others. CSOs can help increase the awareness of local communities of external opportunities and threats. This includes developing the capacities of various stakeholders in areas such as forest management and conflict transformation, and generating appropriate knowledge, giving voice to local communities, monitoring the practices of government officials and other powerful actors, and facilitating transnational networks.

There are apparent differences in political systems and donor support between countries which shape civil society activity. On the one side are countries such as the Philippines which CSOs have grown rapidly in number and influence over the past decades due to an accommodating political system and significant assistance received from international donors. On the other side are countries such as China, Lao PDR, Myanmar, and Vietnam where the activities of CSOs are small in scope, oriented more toward practical action, engaged less in political advocacy, and typically less visible to international observers. However, even in these countries there is a discernible trend of democratization.

CF is sufficiently adaptive to serve as a suitable vehicle for progressive change in all the countries regardless of their political systems. In countries with a strong civil society, it may primarily serve as a symbol for political advocacy and grassroots organizing. For example, CF has provided a rallying ground for CSOs in Thailand to advocate for the rights of ethnic minorities and other disadvantaged rural people. In countries with a civil society limited in scale and scope, CF provides a template for practical interventions on the ground and proposals for forest policy reforms.

Table 1. The different roles of CSOs in the development of CF

Role	Description and example organizations and activities
Advocacy	CSOs have a great potential to influence policy design and implementation at local, national and regional levels, though this greatly depends on their working environment. The Rights and Resources Initiative (RRI) in its work to support local communities' and Indigenous Peoples' in their fight against poverty and marginalization promotes greater global commitment and action towards policy, market and legal reforms that secure their rights to own, control and benefit from natural resources, especially land and forests. Their work is based on conducting research on national levels, as well as and facilitating discussions to generate new policies, as well as improve the implementation of existing policies. Additionally they engage government policymakers and CSOs and communities to share research and lessons learned. In Asia RRI works in China, India, Indonesia, Lao PDR, Nepal, Philippines, Thailand. An example of RRI's work is demonstrated by its support of national policy dialogues and exchange visits of high level government officials to China, Mexico and the USA to see impacts of enabling regulatory frameworks for local people. This has been undertaken since 2011 in the context of influencing the revision of the national land and forest policies ongoing since 2012 (RRI 2013).
Awareness raisers	Generally speaking all CSO activities include increasing the awareness of, for instance, communities, government officials, for example, regarding climate change mitigation (e.g. REDD+) and adaptation. FECOFUN (Nepal) played a central role in informing CFUGs of the signing and its implications of the Peace Agreement (2006) between the government and Maoists. Its network was in many ways the most effective communication platform for disseminating the message, and what this meant for CFUGs (Barnhart 2011).
Barriers	Many CSOs oppose the handing of forest management rights to communities based on, for example, the belief that communities are the cause of deforestation and link them to devastating floods (e.g. Thailand and the Philippines) and loss of biodiversity (e.g. the Philippines). The Haribon Foundation (Birdlife International) in the Philippines pushed for the cancellation of Community Based Forest Management (CBFM) agreements based on the belief that CF runs counter to biodiversity conservation where forests should be preserved and protected away from human activities. This resulted in the imposition of significant restrictions on timber harvesting in CBFMs, particularly via the enactment the integrated protected area system Act (IPAS) of 1992. Haribon has since changed its strategy to become more participatory, acknowledging the important positive role that forest communities can play in forest protection (Dressler et al. 2006). In Thailand the dark green conservation group the Dhammanat Foundation has strongly opposed the Community Forestry bill, especially regarding the proposed establishment of community forests within protected areas. Their opposition is, similar to Haribon, based on the belief that forest communities' activities, including shifting cultivation, are inherently destructive. They see

	the path of forest protection being based on establishing wilderness areas where human activity is minimized requiring the resettlement of forest communities (WRM 2002).
Capacity development	In principle CF is the shift in power from government to the local level. One of the fundamental challenges in this is that communities often lack the capacity to fulfill the responsibilities and maximize the benefits from this. The situation is further complicated by the often onerous restrictions placed in their way (e.g. regarding regulations for forest management). Additionally one must consider the heterogeneous nature of the community regarding their interests and values and requirements to effectively capture and translate these into a coherent management plan. Finally the devolution of power places additional burdens on government officials, particularly at the local level, which they are often unable to meet. RECOFTC – The Center for People and Forests has trained over 25,000 people from more than 30 countries since 1987 on topics related to CF, including managing natural resource conflict and Free, Prior and Informed Consent (FPIC) for REDD+, the impetus behind RECOFTC's capacity development efforts is to improve the ability of people and organizations to conduct CF effectively and sustainably (www.recoftc.org).
Conflict management	CSOs often play a vital role in conflict management, attempting to ensure the positives of the conflict come to the fore (e.g. as a catalyst for social change). The Seub Nakhasathien Foundation (SNF), a Thai NGO, helped to mediate a conflict in Kanchanaburi between communities and government over the establishment of national parks in the communities' boundaries. The mediation resulted in the opening of a path for reconciliation and co-management of the National Parks. SNF used tools beyond traditional mediation such as providing 1-day trainings on GPS and mapping, the aim of which was to empower villagers to 'talk the same language' as the government officers, especially regarding demarcation of boundaries. Training also enabled the parties to meet, talk and discuss the conflict issue together (e.g. by giving communities members increased knowledge they would be more confident to sit at the mediation table). It should be noted that SNF is a conservation NGO, not a mediation organization, which partly explains the unconventional mediation methods employed (Dhiaulhaq et al. 2013).
Facilitators	CSOs invest a great deal in creating an enabling environment for the development of CF activities (ranging from marketing of CF products to empowerment). CIFOR, together with local NGOs in Jambi, Indonesia (Gita Buana and PSHK-ODA), worked with community members and government officials to more effectively involve all stakeholders, particularly local women, in forest-related policymaking. This included ensuring that community members had access to relevant information and knowledge; the assumption being that if communities have access to all the relevant information they will be able to give an informed decision on, for example, whether they agree to a project going ahead on their land (Colfer et al. 2008).
Investors	CSOs often attempt to improve the socio-economic conditions of communities through improving, for example, market access. This includes providing or being guarantors of micro-loans in order that the community, for example, can purchase equipment to

	improve the efficiency of their operations. Often the trees owned by the communities will act as collateral thereby encouraging the communities to not fell the trees before they reach their full potential in financial terms. The National Women's Association of Bhutan (NWAB) works to promote the socio-economic condition of women, empowers disadvantaged communities, and contributes towards their well-being and development. Its activities include providing credit and savings schemes for rural women. One such scheme supporting herbal medicine cultivation seeks to facilitate access to credit of small-scale economic development initiatives for the disadvantaged women. In addition to the direct benefits for the women concerned it also encourages improved land management (NWAB 2012). An additional example from Thailand demonstrates the potential role of CSOs in providing micro-loans. The Tree Bank encourages villagers to plant trees that can be used as collateral for securing loans from a bank. The idea is based on the fact that the value of the tree increases as it grows to maturity, and by the tree being collateral on the loan the villager is encouraged not to cut it down early. The Tree Bank scheme also collates data on various ecological, social and economic issues of the villagers involved in the scheme. The scheme was launched in 2006 and aims to cover 2.5 million villagers by 2024.
Researchers, archivists and documenters	CSOs play an important role in increasing the knowledge of various facets of CF, including its impacts, without which it would be difficult for CSOs to effectively carry out their other roles. Universities and research institutes play a fundamental role in this. Examples include research by western and domestic universities on highlighting complexities and falsehoods on causes of deforestation. Universities in the region are, on the whole, supportive of CF, though with varying influence (Figure 1). Forest Action in Nepal publishes a dedicated journal examining key aspects of CF. The Journal of Forest and Livelihood aims to encourage and collate research that informs the land use policy process by facilitating dialogue among professionals, activists, researchers and policy makers. In Malaysia in 2011 the Human Rights Commission of Malaysia (SUHAKAM) embarked on its first National Inquiry - the National Inquiry into the Land Rights of Indigenous Peoples. The Inquiry commissioned independent researchers and domestic universities to research various issues regarding the current status of land rights for indigenous communities. The main roles of SUHAKAM are to increase awareness of issues relating to human rights, as well as advising the government on policy formulation (www.suhakam.org.my/).
Voice	CSOs are an important platform for providing a voice to marginalized groups and acting as voice surrogates. This is in the context of significant resources that can be leveraged by government and industry in dealing with communities, and how this is somewhat counterbalanced by the reach of CSOs in connecting forest communities to the general public. An example from the Philippines highlights the importance of this: As CSOs increase the awareness among indigenous communities of their rights, their voices are increasingly becoming prominent against mining and other resource extraction

	activities targeting their ancestral lands. Lumads (indigenous ethno-linguistic groups who were neither Christianized nor Islamized) in South Cotabato (Mindanao), for instance, are opposing the operation of Sagittarius Mines that encroaches on their ancestral domain. This has proven to be problematic since a number of them died pursuing their rights (Sunstar Davao 2012).
Watchdog	One of the key roles of CSOs is acting as a watchdog highlighting failures of officials (e.g. regarding corruption) and companies. For example, in Nepal Forest Action is making significant efforts to combat corruption among CF institutions, recognizing this as a significant threat to the viability of CF in the country. Efforts include promoting and institutionalizing anti-corruption mechanisms through civic awareness, networking and campaigns at the local level (Forest Action 2013). In Thailand, academics have played a key role in the issue of establishment of national parks. The parks' establishment has often resulted in conflict as communities find their land being appropriated. Academics have played a key role in raising awareness and driving discussions regarding the rights of the communities affected, as well as in the drafting and continued lobbying for the implementation of the Community Forestry Bill (Zurcher 2005).

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[PL2-1]

Characteristics and problems of Japanese Forest owners' Associations

Comparative consideration with German forest owners' associations

Yasuto HORI[1]

Abstract

One of the key characteristics of Japanese Forest owners' Associations (FOAs) is that most employ forestry workers, which is quite different to German FOAs. The historical backgrounds to FOAs in organized Japanese forestry labor group are as follows. The Japanese economy grew remarkably in the 1960s. In the process, the economic disparity between agriculture and industry and urban and rural areas widened. Consequently, many young people moved from rural to urban areas for work, and the rural area suffered from a lack of workforce. Although a similar phenomenon was seen in many other industrial countries, it was particularly acute and rapid in Japan. The Government of Japan supported FOAs in organizing forestry worker groups, as measures to mitigate the decrease in forestry workers. The government measure was important in retaining employment in rural areas. Conversely however, this also became an indirect cause blocking new entry into the forestry business. Without competition between forestry businesses, there is no service improvement for forest owners. In addition, FOA directors focus on maintaining the employment of forestry worker groups and may neglect to improve service for FOA member forest owners. From a long-term perspective, it is desirable for the FOAs in Japan to form independent forestry worker groups.

1 Introduction

The Ministry of Agriculture, Forestry and Fisheries (MAFF) announced the Forest and Forestry Revitalization Plan (Revitalization Plan) in December 2009 under the new Democratic Party government which came to power in autumn 2009. The plan targeted forestry rejuvenation and generating further revenue in rural areas. The government cited a wood self-sufficiency ratio ranging from 20% at present to 50% in 2020 as a numerical target in the Revitalization Plan. To achieve the infrastructure (forest roads, skid roads) improvement, personnel training, FOA reform and demand reclamation would all be necessary (MAFF, 2009.) FOA reform was a key component of the Revitalization Plan.

The following points were shown in the content of the FOA reform in the plan (MAFF, 2010):

- FOAs should take responsibility for consolidating forest practice sites,
- Consolidating forest practice sites, establishing a consensus among forest owners and utilizing the Forest Management Plan (FMP) are preferential duties of FOAs.
- Securing fairness with FOAs and private forestry businesses upon preparation and/or practice of FMP.

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・Establishing and making work rules for non-membership to avoid disturbing the regular work of FOAs.
・Clarification of FOA accounting to facilitate checking by members.

Accordingly, with the above proposals, the government expects FOAs to devote themselves to consolidating forest practice sites to overcome the disadvantage of the Japanese forest possession structure (small and fragmented.)

Actually, the fact that the total jobs requested by members is small and varied and the forestry practice sites are small and fragmented make consolidating forest practice sites very difficult. Conversely, the jobs requested from non-membership, i.e. national and prefectural forests, are on a relatively large scale, and their site is integrated. Therefore, some FOAs tended to prioritize works requested from non-membership rather than those from members.

This is because many FOAs have numerous staff and forestry workers. It is important for FOA directors to retain staff and forestry workers in employment. Some FOAs prioritize the stability of their organization and are not necessarily helpful for members. This feature characterizes Japanese FOAs and causes significant problems.

The purpose of this paper is to determine why Japanese FOAs have such characteristics in comparison with Germany, and to consider their directionality.

2 Methods

FOAs of Japan and Germany are similar in many ways. I select a method to clarify the characteristics of Japan's FOAs by comparing them in both countries from perspectives of history, the institutions, and the current status.

First, I describe the history of the FOA institutions of both countries. The FOA institutions were subject to major changes three times since being introduced to Japan. I explain the change to the Japanese FOA system based on individual changes to the Forest Law. Conversely, for Germany, I review the history via the book "Forestry and Environment" written by Karl Hasel (Hasel, 1971.)

In addition, in the case of Japan, the FOA institution changed fundamentally each time. However, it has retained the name FOA in Japanese, even if its contents have been completely changed. I call it "FOA" in this paper.

Second, I discuss the institution of FOA in terms of the newest legislation, namely the Forest owners' Associations Act of Japan and the Federal Forest Law of Germany. Here, I stress the similarities and differences between the institutions in both countries.

Third, I clarify the present conditions of the FOAs of the two countries. Therefore, in the case of Japan, the Forestry Agency "Forest owners' Association Statistics" and literature are used, while for Germany, mainly literature and field survey results are used.

Fourth, I extract the problems of the Japanese FOA based on its characteristics in comparison to Germany. I focus on the employment labor of FOA as exposing a difference in the FOA of both countries, particularly the way it significantly influences relations between association and members, and FOA management.

To conclude, I discuss the future development of the FOA.

3 Results and Discussion

3.1 History of FOA in both countries

FOAs have a long history in both countries. Originally, the FOA was a labor organization which managed common forest together. The FOA existed as an organization to collectively manage small-scale private forest, even after common forest was privatized.

I start by surveying the history of the FOA of Japan. The history of the Japanese FOA institution can be classified into three terms: (1) FOA, based on the 1907 Forest Law, (2) FOA, based on the 1939 Forest Law and (3) FOA, based on the 1951 Forest Law. Incidentally, Chapter 6 of the Forest Law became independent as the Forest owners' Association Act in 1984, although the FOA institution remained fundamentally the same as under the 1951 Forest Law.

The 1907 Forest Law positioned a scope of collective organization of the forest, which already existed in some regions, in FOA institutions under national law. Under this law, the association was optionally established, although local forest owners were forced to become members, when it was established. There were 4 types of FOA; Engineering Works Associations, Forest Practice Associations, Afforestation Associations, and Protection Associations respectively.

In the background, The Land Reform of the Meiji period was completed, and wood demand increased due to the Japanese-Sino War (1894-95) and Japan and Russia war (1904-05). To preserve and utilize the forest at the same time, private forest owners had to be organized as the source of support measures from government.

The 1939 Forest Law positioned FOA as the organizing in control of forestry under the wartime economy. FOAs were established in cities, towns and villages nationwide by the order of the prefectural governor forcing their establishment, meaning local forest owners were made to join FOAs forcibly. At this time, the organization of the forestry association was strengthened, the National Federation of the Forest owners' Cooperative Association was established on a national level, the Prefectural Federation of the Forest owners' Cooperative Association established on a prefectural level, and the unit forestry association was generalized on the level of cities, towns and villages.

The 1939 Forest Law specified two type of FOA; A Forest Practice Direct Management Association which drew up and implemented the Forest Practice Plan itself, and a Forest Practice Adjustment Association, which drew up the Forest Practice Plan for members and adjusted each member's practice to fit the same. Ultimately, the FOA institution of the 1939 Forest Law tried to answer the question of how forest resources could be enhanced and timber production performed systematically, by creating the Joint Forest Practice Plan and ensuring its implementation by FOA (Suzuki, 1987.)

The Forest Law was revised after World War II in 1951, whereupon the FOA institution changed dramatically. The FOA became an organization based on a cooperative principle with free subscription and withdrawal, and with a one-member one-vote system, equivalent to the current system.

The 1951 Forest Law prescribed two types of FOA; Facilities Association and Production Associations. In

Facilities Associations, members had proprietary rights and the right to manage the forest. Conversely, in Production Associations, the association had proprietary rights and the right to manage the forest.

There were various FOAs historically and regionally in Germany. They could roughly be divided into two types, i.e. Property Associations and Management Associations. In Property Associations, the proprietary rights of the individual owner are transferred to the Association by establishing the association . Conversely, in Management Associations, the proprietary rights of individual owners and rights of disposal are left to each member of the association. The former Property Association was an older type of FOA. In those days, the FOA was considered as a means of organizing many small forests and running based on a unified long-term Forest Practice Plan by forestry expert; regardless of personality and the interests of forest owners (Hasel, 1971.) Such Property Association was not supported by farmers, because the forest was not freely available to farmers.

The recent FOA is the latter Management Association. Here, the owner runs his/her forest independently, and the association only acts for the subject shown in the articles of association. The reasons why right of forest management remain with the individual owner are the improved advice system by the state government and/or the chamber of agriculture. Therefore the FOA operates in various ways based on the degree of development of the public advice system by region**.**

Federal Law concerning the Forest owners' Association was promulgated in 1969. The federal government does not deny the diversity of FOA and tried to make this law a premise for financial support for FOA. The FOA institution based on the 1969 Federal Law was succeeded by the Federal Forest Law in 1975, and remains in force today.

3.2 Outlook of FOA institutions

The FOA system of Japan is defined by the Forest owners' Association Act, which has prescribed two kinds of associations, i.e. a Forest Owners' Association and a Producing Forest Association. In the former, individual members have proprietary and management rights to their own forest. In the latter Producing Forest Association, the association has proprietary rights to the forest. The members of the association collaborate in groups for forest management in principle. The former association is cited when discussing forest owners' associations in Japan today and is the former Forest Owners' Association covered in this paper.

The Forest owners' association in Germany is prescribed under Federal Forest Law in Chapter 3. Three types of associations are prescribed by this law, namely the Forestry Management Community (FBG), Forestry Management Association (FBV), and the Union of Forest Association (FWV.) The FBG is an organization of forest owners under private law, while the FBV is an organization under public law; compulsorily established by the state if needed. FWV is an alliance under private law consisting of authorized FBG, FBV, and similar organizations established based on state laws. While the FBG resembles the Japanese FOA, the FBG is considered equivalent to the FOA in Germany in this paper. The FBG may also assume the form not only of a non-profit institution but a profit corporation, unlike the forestry association in Japan, which is a non-profit institution.

One purpose of the FOA of both countries is to overcome the economic disadvantages facing forest owners as small producers through cooperation. The eligibility requirement to become members of the association is to be a forest owner. However, in the case of Japan, even non-forest owners can become semi-partners (without voting rights.)

The main services which FOAs of both countries provide for members include consultancy, sale of round wood, afforestation, felling and logging, establishment and maintenance of forest roads, etc. Japanese FOAs can provide more wide-ranging services than German FOAs, and funding and woodland dealing as well as the above.

3.3 Actual Condition of the FOA, and Feature of the Japanese FOA

There are 676 FOAs in Japan, and this total is declining, due to mergers between associations. There were 1.57 million members in 2010, and the total area of forest owned by members was 10.95 million ha in 2010. Both membership and forest owned are on the decline. However the number of members and the forest areas per association have both tended to increase, due to the effects of mergers. As of 2010, the number of members per association was 2,318, and the forest cover per association was 16,201 ha (Table 1.) In addition, the association participation rate among forest owners is 47%, and the area participation rate is 63%. The FOA can be considered a familiar concept for Japanese forest owners.

Table 1: Transition in the number of forestry associations, membership, and areas in Japan

	1995		2000		2005		2010	
Number of FOAs	1,430		1,153		842		676	
Total membership (persons)	1,717,742	(1,201)	1,669,263	(1,448)	1,618,386	(1,922)	1,566,729	(2,318)
Association area (ha)	11,408,081	(7,978)	11,295,684	(9,797)	11,148,271	(13,240)	10,952,197	(16,201)
Area per member (ha)	6.6		6.8		6.9		7.0	

Source: Forestry Agency " Forest owners' association statistics" (Annual)

Note: Numbers in parentheses indicate the membership or members' area per association.

In Germany, the federal government does not determine the number of forest owners' associations nationwide on a regular basis, meaning I was obliged to use slightly old data. Table 2 shows the transition in the number of FOAs and membership, member totals and areas following reviews in 1995, 2001 and 2003, and investigations by different organizations respectively. The number of FOAs has tended to increase with 1,223 associations in 1995, 1,677 in 2001, and 1,723 in 2003 respectively. The number of members per association is just under 200, and the forest cover per association member is around 2,000ha. The area scale of the forestry association in Germany varies. The area of small associations is approximately 100ha, and that of major ones exceeds 50,000ha (Borgstädt, 2004.)

Forest cover owned by FOA members is 3,150 thousand ha, and FOAs covers 45% of private and community forest areas because their forest area as a proportion of the entire German land area is approximately 6.98 million ha.

Table 2: Transition in the number of forestry associations, membership, and areas in Germany

	1995*		2001**		2003***	
Number of FOAs	1,223		1,677		1,723	
Membership totals (persons)	235,900	(193)	295,930	(176)	311,348	(181)
Association area (ha)	2,515,000	(2,056)	3,121,390	(1,861)	3,149,709	(1,828)
Area per member (ha)	10.7		10.5		10.1	

Source: Borgstädt, 2004

Note 1: Original data are *Bericht des Arbeitsausschusses Forstbetriebsgemeinschaftsstrukturen des Waldbauemverbandes Nordrhein-Westfalen,1995. **BMVEL,2002. ***AGDW,2004

Note 2: Numbers in parentheses are the membership or members' area per association.

An mentioned above, this shows that the scale of each FOA of Japan exceeds that of Germany. At the same time, Japanese FOA have many directors and staff, and are undertaking various activities.

The average number of full-time directors and regular staff in Japanese FOAs is 11.3 (as of 2010) per association, while the implementation rate for each FOA activity in Japan is as follows: afforestation and tending young forest (97.2%), wood production and sale (74.7%), purchasing activity (97.6%) and sawing processing (29.9%.) Afforestation and tending young forest used to be key for FOA in terms of income. To undertake these activities, afforestation, tending young forests, and wood production in particular, 95% of associations have forestry workers' groups. The number of employed forestry workers per association is 38.5.

Conversely, the key activity of German FOAs is the sale of round wood. Based on an oligopoly in the wood industry, round wood sale by the FOA has become increasingly important today. Most FOAs outsource wood production, and afforestation and tending of young trees to local businesses, meaning few have full-time personnel. It is also very rare for FOAs in Germany to have forestry workers' group or employ forestry workers (Shiga, 1995; Hori, Ishizaki, Kuboyama and Hirano, 2013.)

In comparison with Germany, one characteristic of the Japanese Forest owners' association is to internalize the forestry workforce at the organization. This is also a problem of Japanese FOAs.

3.4 The problems of Japanese FOAs

The FOA is a cooperative of forest owners, which is run by a cooperative principle, and the service to members must be prioritized above all. However, the FOA must also maintain an organization undertaking various activities and keep personnel and forestry workers in employment.

It is often seen that some FOAs in Japan prioritize more profitable business, e.g. for national and/or prefectural forest. In particular, the maintenance of business and employment is thought to have expanded in line with the business scale following a merger. Moreover, the FOA management responsibility is linked legally to directors' unlimited liability, reflecting an intensifying pursuit of profit.

Accordingly, the FOA has forestry workers' groups within its organization and undertakes various activities based on historical circumstances. While developing the Japanese economy after the 1960s, the income differential between agricultural and forestry sections, and commerce and industry sections was expanded, and the population moved to urban areas from rural ones. The government implemented a policy which improved the production structure of agriculture and forestry to improve productivity and income from these areas. The Forestry Structural Improvement Project (FSIP) was part of this and represented a turning point for FOAs. The main contents of the FSIP included the construction of forestry roads, and organization of forestry workers' groups to promote the mechanization of forestry and retain forestry labor (Handa, 1990.)

Japanese forestry was also long dependent on a labor force which was stagnating in rural areas, given the relative surplus of population for a long time. However, given the high economic growth since the 1960s, the outflow of the labor force from rural to urban areas progressed, particularly among the younger generation, causing a sudden mismatch in the labor force. The total of full-time Japanese farmers supplying the forest workforce plummeted compared to Germany (Kobayashi, 1990.) Due to relocation elsewhere and/or household members becoming salaried workers , it became difficult for the forest owner to obtain the required labor force in a neighborhood, whereupon the formation of forestry workers' group in the FOA can be said to correspond to the reduction in work force in rural areas (Handa, 1965; Suzuki, 1987.) In the late 1980s, the Japanese economy suffered a labor shortage due to the bubble economy again. This prompted the FOA to take measures to secure the workforce, achieve stable employment and maintain the labor environment, and meet social security needs in the forestry section. In the above section, slimming the forestry workers' group of FOAs was difficult, because the FOAs had been used as a means of ensuring forestry labor by the government, which meant that they blocked the entry of private forestry businesses into local forestry.

Another significant problem is that the consolidation of forest practice sites was focused on and became the key activity of FOAs in the Revitalization Plan. After the Revitalization Plan, the Forest Management Plan (FMP) was newly introduced instead of the Forest Practice Plan. The processes of establishing the FMP were as follows. Initially, the plan creator decide on a target forest which comprises several compartments. Secondly, the plan creator appeals to owners of the target forest to consolidate forest practice and receives more than 5-year management trust for the target forest from forest owners. Thirdly, the plan creator makes a 5-year Forest Management Plan, i.e. coordinates and distributes forest practice for 5 years. Finally, the forest practice is implemented alongside the plan. However coordination and consolidation of forest practices is difficult, given the immense time and effort required to obtain a consensus. When a plan is formed and implemented, government subsidies are available.

Anyone with the required ability and motivation can make the FMP. Most FMP is actually made by

FOAs, which get commission in the form of a subsidy. In addition, by FMP, the FOAs can implement forest works in a structured way. This is a benefit of FOAs in terms of stabilizing the employment of the FOA workers' group . Paradoxically, the FMP system was introduced to maintain FOAs which already contained many personnel and forest workers. A key point is whether the forest owners benefit from the consolidation of forest practices. In other words, the reduced cost of forest practice work by consolidation must exceed the cost incurred for obtaining the consensus for consolidation.

4 Conclusion

The FOA has played a significant role in forest practices in place of weakened forest owners and has helped secure the forestry work force and improve the treatment of forestry workers. The FOA has been vital to Japanese forestry. However, this has meant considerable national support being channeled into the FOAs. While the Revitalization Plan stated FOA reform as a particular emphasis, It did not eliminate the dependence of the FOA on subsidies, for what are thought to be political reasons.

The following points can be considered the future direction of FOA: First, the organization must be slimmed down. The first step is to form independent forestry labor group organizations, which most FOAs currently have. Accordingly, the management burden of the FOA is eased, it is easier for local businesses to enter and improved service to forest owners by competition between local forestry businesses is expected. The forest owners can request forest practices; not only from the FOA but also private business, and the choice is extended.

Second, the overemphasis to consolidation on the part of the FOA should be reviewed. Consolidation is time-consuming and labor-intensive and there are doubts over its effectiveness in terms of balancing labor and time. The FOA should utilize resources appropriately to maintain basic information such as determining the members of an association, updating forest registers and clarifying forest possession boundaries. While the computerization of basic information has advanced in the FOA, updating data becomes important.

Third, the FOA and its federation organizations should emphasize round wood sale. Since the Japanese forest resources need to be used, an increase in round wood production is expected, and the oligopoly of the wood industry advances. Accordingly, the FOA should strengthen the price formation of round wood by cooperation (Hori, 2011.) It is thought that the benefit from cooperation in terms of sales will exceed the consolidation of forest practices.

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[PL2-2]

Outsourcing forest management and harvesting operations

Leasing system for Finnish private forest holdings

Mikko Kurttila[1] and Jouni Pykäläinen[2]

1 Introduction

Many forest owners would value services that make their forest ownership easy. 38% of Finnish family owners have already reached the age of 65 years and 35% of owners do not live in the municipality where their holding is located (Hänninen et al. 2011). This can greatly complicate practicalities related to forest management. For example, for the mentioned 35%, the average distance of 193 km from their forest holding makes it difficult to independently carry out and even manage forest operations. In addition, living elsewhere makes it more difficult to find forestry professionals to carry out management activities and to supervise the quality of their work. However, forest management associations have for several decades offered local services for Finnish forest owners. More recently the forest industry has developed and started to actively market different forest property management services – evidently also aiming to improve customer loyalty. However, the services currently available do not provide totally carefree ownership as they demand some level of activity for each separate management operation. In addition, the forest related incomes and investment costs vary. Particularly in small holdings it is practically impossible to have balanced income flow due to the fact that cuttings can be carried out only occasionally e.g. in five to ten year intervals.

Long term forestland leasing could provide an alternative for making forest ownership easier and forest management more professional for those forest owners who do not have the required time, expertise or motivation for managing their forest property by themselves. In fact, when searching for solutions to activate private forest owners' timber supply, a forestland leasing system has recently been suggested for Finnish family forest owners (e.g. Kurki et al. 2012, Metsätilakoon… 2012). These suggestions have remained rather vague as they have not created practical suggestions for a leasing system, considered how this kind of system would function, or shown how the periodical rent payment could be defined. However, a long-term forestland leasing system is already in use in many countries. Its use is mainly related to large areas and to less developed infrastructures, but it has also been used in non-industrial private forestry, especially in the United States.

The aim of this study is to introduce the basic characteristics of a leasing system for family forest holdings through example calculations. The system is based on a holding-level forest plan that defines the activities that the leaseholder may perform during the lease period. In addition, we illustrate what kind of effects the selection of a certain pricing system and flexibility given to the leaseholder may cause for the

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forest owner. For this, we use a Finnish private forest holding of 95 ha as a case example.

2 Material and methods

2.1 Brief definition of the leasing system

The proposed leasing system includes outsourcing of timber trade and harvesting operations as well as silvicultural treatments. Other uses of forest holdings, for e.g. recreation and hunting are not affected by the leasing. The system is based on the basic model suggested by Klemperer (1996) in which the annual lease payments are defined so that their net present value equals the net present value of expected timber harvesting incomes, reduced by the expected costs of silvicultural operations. Thus, when making the leasing contract, the stands that will be harvested or in which silvicultural operations will take place need to be defined. The selected stands as well as the accurate timing and more detailed description of harvesting and silvicultural operations in these stands (e.g. what tree species will be planted to a clear-cut area) are defined in a forest plan which is created for the forest area that will be leased. In the forest plan, the intensity and location of cuttings correspond to the owner's forest use objectives.

There are several ways to define the timber prices applied when making the lease contract. The selection of the pricing system will affect the level of annual payment. In principle, it is possible to use the initial price level. The problem is that if the timber prices increase, the forest owner becomes dissatisfied. Alternatively, the lease payments can be connected to the development of actual timber prices or some generally used price index which at least partly eliminates the timber price uncertainties. The drawback is that the forest owner is unable to utilize timber price peaks, i.e. to sell more timber when he assumes that the prices are at their highest level.

During the lease period, the leaseholder is responsible for following the forest plan. However, it is possible to give the leaseholder some degree of freedom in carrying out the harvesting operations. For example, it can be agreed that it is possible to make the cuttings earlier or later than defined in the forest plan. If the leaseholder makes the cuttings earlier, the forest owner benefits as after the lease period the regenerated forests will be older. If the cuttings are made later than defined in the forest plan, the forest owner will suffer as the newly established forests are younger. In addition, due to delayed cuttings the leaseholder gets more cutting removal than has been estimated in the forest plan. When making the lease contract, these issues can be taken into account either when defining the initial lease payment or by agreeing on compensations which will be paid at the end of the lease period if needed.

2.2 Case study materials

A forest holding located in Southern Savo, Finland was used in case study calculations. The total forestry land area was 95.2 ha. The volume of the standing stock was rather high as it was initially 129 m^3 $ha^{-1.}$. 27% of the forests were less than 20 years old, 26% were between 20 and 40 years, 38 % were between 40 and 60 years and of the remainder of the forests, 10% were at least 60 years old. The dominant tree species in these forests were Norway spruce (*Picea abies*) with 47% of total standing timber volume, Scots pine (*Pinus sylvestris*) 23%, and those of birch (*Betula pendula* and *Betula pubescens*) and other deciduous trees 30% respectively.

For calculating the economic outcomes from harvesting and forest management as well as annual lease payments, stumpage prices from years 2001-2010 were used (Finnish Forest Research Institute 2012). The stumpage price indexes were adopted from Aarne & Ollonqvist (2012).

2.3 Creation of the forest plan and lease payment calculations

The basis of the lease calculations is the forest plan created for the forest holding. In this study, the lease period was nine years, so the forest plan was also created for a nine year period. The plan consisted of three sub-periods. All harvesting and silvicultural operations were assumed to be carried out in the middle of the three year period. In order to illustrate the effects of realized price development, we assumed that the lease period started from the beginning of 2002 and it then ended in 2010. Stumpage prices from 2001 were used for calculating the level of lease payment based on initial timber prices.

Monsu forest planning software (Pukkala 2008) was used in the creation of the initial forest plan and related additional calculations. Monsu was first used to simulate alternative and practically feasible management schedules for individual stands of the holding based on built-in event routines and forest management recommendations (Hyvän metsänhoidon… 2006). In the simulator, the future development of the growing stock (in-growth, growth and mortality of trees) is estimated by using tree-level models (Hynynen et al. 2002). For the nine year planning period Monsu simulated 1 - 6 alternative treatments for each stand. One of them was always a “no treatment” alternative. In the next phase, the heuristic optimization method of Monsu was used to select one management schedule for each stand so that the user-specified holding-level objective function value was maximized. In the case study calculations, the objective was to maximize the net present value of future forest management costs and incomes with a 3% interest rate.

We also tested the effects of a situation in which the leaseholder is given more freedom so that it was possible to carry out certain harvesting operations earlier or later than defined in the initial forest plan. For this, two new forest plans were created so that in the first new plan 11.5 hectares of clear-cuttings were moved ahead so that they were carried out during the first sub-period. In the initial plan where the net present value was maximized these clear-cuttings were done during the second or third sub-period. Similarly, 7.6 hectares of clear-cuttings were postponed to the last sub-period in the second new plan. These new plans were formed so that we manually prohibited all other treatments from the selected stands.

For calculating the annual lease payments, the following calculations were done:

1) Net incomes for the three sub-periods were calculated by using different stumpage prices, i.e. initial stumpage prices from 2001 and realized stumpage prices from the last year of each three-year sub period (2004, 2007 and 2010). In addition, a posterior calculation by using average timber prices from the whole lease period was also completed.
2) NPVs were calculated by discounting the periodical net incomes to the starting point of the lease period.

3) Fixed term annual annuity was calculated from the NPV to find out the annual and periodical lease payments. This was done by using the equation $(i * (1 + i^n)) * ((1 + i^n) - 1)^{-1} * NPV$.
4) For the annual payment based on the timber price index, the annual payments calculated in previous phases were multiplied with the annual price index multipliers.

3 Results

The use of different stumpage prices has a clear effect on periodical net incomes and NPVs (Table 1). The use of realized prices results in the biggest increase in NPV due to a price peak that occurred during the second sub-period. In addition, advanced and delayed clear-cuts in selected stands also caused changes to periodical net incomes. However, the NPVs do not change that much.

Table 1: The periodical net incomes (NI) and their discounted net present values (NPV) with a 3% interest rate in different forest lease alternatives for the case study forest holding.

	NI 1st period (€)	NI 2nd period (€)	NI 3rd period (€)	NPV (€)
Max NPV, initial prices	37226	36089	90826	139972
Max NPV, realized prices	36856	50744	108135	166315
Max NPV, average prices	41186	38172	98904	152056
Earlier clear-cut, initial prices	94137	11099	43660	134750
Delayed clear-cut, initial prices	14354	15087	146248	144108

The selection of pricing principle affects the annual lease payments considerably. When initial prices are used, the annual payment is about €18 000 (Figure 1). The use of the stumpage price index results in a lower annual payment due to negative development in the overall price index. Only in the price peak (in 2007), was the payment higher. The use of realized prices results in notable differences between the periodical lease payments. In addition to price differences, this is caused by the fact that the payment is calculated separately for each three year period. Thus, the big differences in cutting amounts also affect the payment (see Table 1, periodical net incomes).

The changes in annual lease payments are rather minor if cuttings are advanced or delayed as the differences are less than €600 (Figure 2). If cuttings are delayed, the cutting income increases as forests have more time to grow. However, at the end of the lease period this results in losses to forest owners as the forests are younger than they would have been in a situation where the forest plan had been followed. This can be seen in the value of the soil expectation value (SEV). The difference of SEV indicates that at the end of the lease period the leaseholder should pay €10 000 in compensation to the forest owner due to delayed cuttings which results in younger forests than expected.

Figure 1: Lease payments with different pricing options. Average prices are calculated from the stumpage price occurring during the nine year lease period, initial timber prices mean that the lease is calculated from stumpage prices in 2001, index means that the annual lease is adjusted according to the development of the real stumpage price index, and current prices mean that the lease is based on the last year's stumpage prices of the three year period (2004, 2007 and 2010).

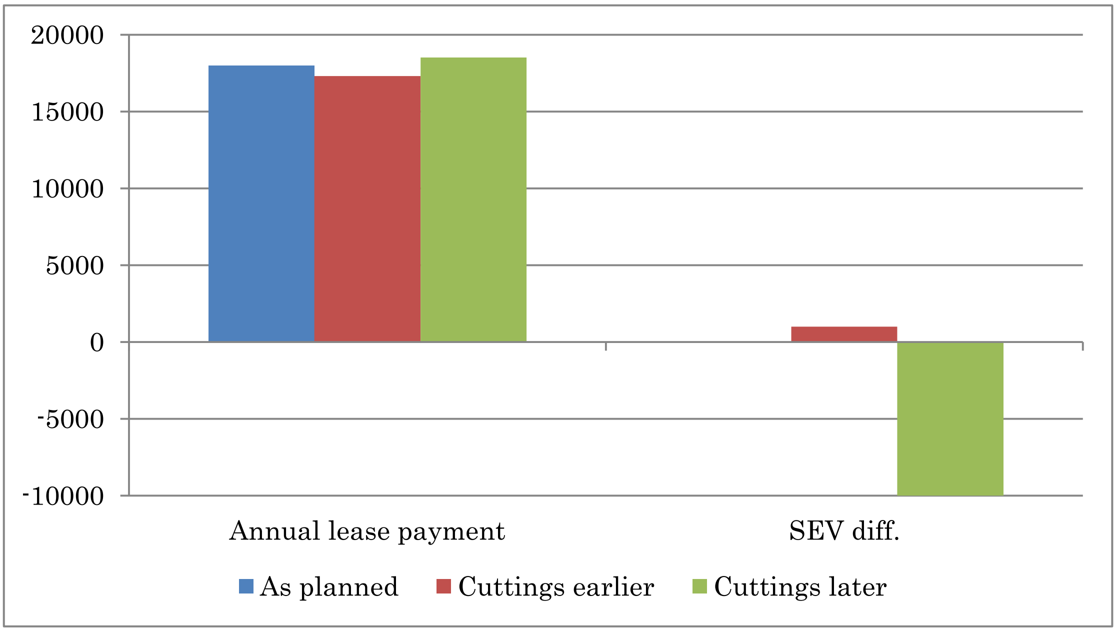

Figure 2: Annual lease payments with initial timber prices if the leaseholder has the right to make decisions on the timing of cuttings (right bars) and the difference in soil expectation value (SEV diff.) in 2010 due to advanced or delayed cuttings.

4 Discussion

As an all-encompassing forest property management service, a leasing system would provide a long-term solution for owners who are not able or willing to actively manage their holdings. In addition, the leasing system may also have potential for making forest management more efficient due to economies of scale related to logistics of timber procurement and the implementation of forest management operations. From this perspective, the leasing system might make it possible for the forest industry to pay higher prices for timber. Because the leasing service would cover a relatively long time period and all the forests of the holding, the leasing system could also become an attractive solution for timber buyers. As a result, it could be possible for the forest service company to spend more time with the forest owner when thinking and defining the objectives for forest management and the conditions of the system.

On the other hand, present Finnish law related to taxation prohibits forest land leasing; timber trade income is taxed according to capital income taxation whereas the leasing income is taxed according to the work income tax rate. For many forest owners, tax paid for work income would be higher than for capital income. Management of uncertainty included in the development of timber prices and forest inventory data (e.g. Islam et al. 2009) forms another main challenge when considering the use of long term forest land leasing in Finnish forestry. One way of including both price and inventory uncertainty into the leasing system would be to correct the annual payment level according to the "realized cutting incomes". Then actually harvested volumes (instead of predicted) and realized timber prices (instead of initial) could be used in calculating the annual lease payment. In this study, we did not consider the effects of inventory errors in the calculations, but they can be notable (e.g. Islam et al. 2009).

Planning calculations would have a crucial role in the introduced leasing system. Forest owners' commitment to the leasing system could probably not be gained without profound analysis of their forest management objectives and the creation of the respective forest plan before making the lease contracts. When doing this, different planning approaches should be used for different forest owners. For example, for those owners who are especially interested in economic aspects and profitability, alternative cash flows and corresponding SEVs at the end of the planning could be produced for supporting the selection of the plan. For forest owners who are interested in multiple uses of forests, the plan could be produced by interactive optimization in a planning session where the representative of the service company and the forest owner participate.

Even small forest service entrepreneurs could act as leaseholders of private forest holdings (Metsätilakoon ja rakenteen kehittäminen…2012). However, making long term contracts and paying an annual lease may – especially in turbulent markets – result in financial challenges for small companies. At least in the beginning of forest leasing, the most appropriate business model for small entrepreneurs might be to offer expert services to large companies. For example, a small planning entrepreneur could take care of the planning session by using modern planning tools and methods. The resulting report could be the basis for large companies to make a leasing contract with the forest owner.

The leasing example in this study adopted a nine year planning period. An almost similar time period (10 years) has also been used in voluntary biodiversity protection contracts, and has proved to work quite well among private forest owners. Hence, a 10 year period is worth testing in pilot studies of forest land leasing systems. On the other hand, the leasing system must correspond to both the lesser and the lessees needs, and these needs should be profoundly understood when developing the system and supporting calculations for the leasing system.

In addition to methodological and technical development work, forest owners' and forest service companies' willingness to make long term leasing contracts as well as policy instruments related to the development of long term forest land leasing should be studied. So far, quite negative attitudes towards long term leasing systems have been mapped out in questionnaires (Kurki et al. 2012). On the other hand, the promises related to the utilization of modern forest planning as the methodological core of the leasing system cannot be easily introduced in questionnaires. Pilot studies of long term forest land leasing might give different results than questionnaires.

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[PL3-2]

Taking migration seriously: What are the implications for gender and community forestry?

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Abstract:

The growing 'multilocality' of rural households and livelihoods, prompted by globalization and the expansion of markets, is likely to have profound effects on who governs forests and how forests are governed, and with what consequences for people and forests. Case studies of two Nepalese villages having different migration patterns and social structures show that forest governance has been feminized in one village and become entrenched and further male dominated in another. Policies and policy-oriented literature on forestry rarely take into account the changes taking place in how rural livelihoods are earned and how gender dynamics are altering. A dialogue among all stakeholders should take place to identify the opportunities and challenges of governing forests in the context of multilocal livelihoods. This also necessitates empowering local frontline agents to negotiate for greater participation of women, a broader re-orientation within forest bureaucracies on gender issues, and acknowledgement of the importance of embracing participatory approaches in practice.

Introduction

Rural livelihoods in the global south are becoming increasingly diversified and are no longer derived exclusively from farming and land. Seasonal and circular migration of some members of the household have become a mainstay strategy adopted to escape state policies and agrarian changes, diversify incomes, offset capital constraints, fulfill aspirations of a modern life, and increasingly respond to growing economic, political and climate-related insecurities (Ashley and Maxwell 2001; Razavi 2003; Rigg 2005). One consequence has been that household incomes are sourced from multiple localities, often beyond rural boundaries (Thieme 2008). Research on gender and migration has long viewed migration as an inherently gendered process that has impacted considerably on the distribution of power between women and men at both the intra- and interhousehold levels. However, the policies have yet to recognize the role of migration in influencing forest governance. This is particularly evident in countries such as Nepal where, despite the importance of migration for the country's GDP and for the livelihood of rural households, community forestry policies continue to be underpinned by the notion that rural households are physically and socially bounded. This perception inadequately reflects the changing landscape of rural livelihoods and gender dynamics. Drawing on ethnographic research on gender, migration and governance of community forests

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about two user groups in the middle hills of Nepal, this InfoBrief underscores the importance of focusing on migration, and outlines some of the resultant implications for community forestry policies.

Community forestry policies in Nepal and lack of attention to the influences of migration

Community forestry was first introduced in Nepal in 1978 by merging two interrelated development paradigms — Himalayan degradation theory and the concept of participatory development. Scholars and policy makers were concerned about rapid deforestation and soil degradation in the middle hills region of Nepal, and that the nationalization of forests (or state monopoly over the governance of forests) was unable to curb environmental decline effectively. At the same time, frustrated with top-down approaches to policy development, others were calling for participatory approaches in order to achieve the sustainable management of forests and to address the basic forestry needs of local people. The underlying rationale behind community forestry was that the local communities who live closest to the forests were best placed to protect, sustainably manage and sustainably utilize them. The government, in turn, became extension agents, providing advice and support to local communities (Gilmour and Fisher 1991; Graner 1997; Pokharel 1997; Britt 2002; Campbell 2002). Since then, community forestry has been hailed as a success and Nepal a leader in mobilizing local communities to manage forests. According to the latest figures from Nepal's Ministry of Forestry and Soil Conservation, about 1.45 million households or 35% of the population of Nepal are managing the 1,652,654 ha of national forests that have been handed over as community forests (CFD 2013).

Those who influence community forestry policy are increasingly questioning the undifferentiated view of local communities and are promoting the importance of gender and social equity for efficient and equitable governance of community forests. Such changes are a product of policy shifts among donors, who remain the major financers of community forestry in Nepal, as well as the increasing politicization of 'caste,' 'class,' 'ethnicity' and 'gender' in Nepali politics more generally. A historical review of donor and government policies on community forestry indicates that gender issues are recently and increasingly framed in terms of greater concern over women's rights, and their access and control over forest resources (Table 1). Furthermore, one of the major consequences of the Maoist movement and ensuing 10-year civil conflict in Nepal has been greater awareness of and demands for social inclusion in the Nepali state and society alike, which in turn have percolated through to community forestry policies. The extent to which these changes will lead to a more inclusive Nepal or one that is further fractured along caste, ethnic, and gender divisions is not yet clear. Nevertheless, this is a major milestone for community forestry policies in Nepal, and it offers important lessons for other countries where gender issues continue to be sidelined and/or are couched in simplistic and potentially harmful discourses over women's inherently 'close relationship with nature.'

The question of how seasonal and transnational migrations are affecting the governance of community forestry polices remains unaddressed in both community forestry policies and the growing policy-oriented scholarship in this field. For instance, the Guidelines for Community Forestry Programmes (Revised) 2009, the major document guiding government officials, NGOs and donors in charge of implementing community

Table 1. Timeline for some significant changes in forestry management, 1978–2009.

Year	Act/Plan	Policy intentions	Outcome/Comments
1978	National Forestry Plan	• Forest and land-use management by the community in selected areas of Nepal • Government to supply technical advice	Local village councils (Panchayats) were given management powers, but the expected trickle-down effect did not occur Forest degradation was not halted
1988/1990	Master Plan for Forestry	• Forests to be managed by users • Users to reap all benefits • Women, the poor and ethnic minorities to be involved in forest management	Gender issues are mentioned for the first time but are rarely operationalized
2009	Guidelines for Community Forestry Programmes (Revised)	• Forestry user groups to be formed and to include: ethnic minorities, Dalits, indigenous people and women	Guidelines state that 50% of the user group should be women, and either the Chair or the Secretary should be a woman

forestry at the local level, do not mention migration at all. This is in spite of the fact that migration has historically been an important part of rural livelihoods. Globalization and the expansion of markets have given added impetus to the growing mobility of Nepali workers through circular migration as they search for international contractual work in the growing cities of India, as well as the Gulf States and Southeast Asia (Seddon 2001). Considerable uncertainties exist over the precise numbers of Nepali citizens working abroad, although there is no doubt that circular and seasonal migration constitute one of the largest sources of employment for the country. Anywhere between 589,080 and 3 million Nepali workers are currently working in India — exact figures are difficult to determine because of open-door policies between India and Nepal. Furthermore, the period between 1998/99 and 2010 witnessed a 13-fold increase in the number of Nepali citizens migrating for employment purposes to international destinations other than India (from 27,796 in FY 1998/1999 to 384,667 in FY 2011/12), according to Nepal's Department of Foreign Affairs. In FY 2011/12, the majority went to Qatar (105,681, 27% of the total migrants) followed closely by Malaysia (98,367) and Saudi Arabia (80,455). These figures only capture documented Nepali workers, that is, they list only those who sought and were granted approval to work abroad by the Department of Foreign Employment. The Department estimates that an additional 40% of the total documented workers are undocumented, but others claim that this figure could be as high as 200% of all documented workers. Migration is largely male dominated. Although the total number of women migrating has been on the rise, women migrants constituted a mere 6% of the total migrant worker population in FY 2011/12 (Pandey et al. In press).

The dominant numbers of men in seasonal and circular migration patterns are likely to be explained by a host of factors such as gender segregation of markets, lack of opportunities for women outside of the domestic sector, gender norms at the household and community levels that stigmatize women who migrate abroad for work purposes, the Nepal government's ban against women working abroad until recently, and the rampant sexual and other abuses faced by Nepali women working in the Gulf as reported by the mainstream media. In a rare insight into the gender dynamics of migration from the middle hills of Nepal to the cities of India, Sharma (2008) demonstrates that the act of migration and its outcomes are often interpreted as a transition from boyhood to manhood for young migrants and their families. By enabling young men to secure their sense of material obligation toward their families, migration reproduces local idioms of masculinity and reinforces a male-dominated household. As the following case studies demonstrate, however, migration interacts with gender, caste and ethnicity to produce a range of outcomes for women and men situated differently within these hierarchies. These gendered dynamics can, in turn, have contrasting implications for the extent and nature of women's and men's voices and their influence in the processes of forest governance.

The two case studies form the basis of a comparative analysis of the implications of caste, ethnicity and livelihood patterns on forest governance from a gender perspective. A combination of qualitative and quantitative methods was used. Structured household interviews, semistructured interviews, focus group discussions, key informant interviews, Participatory Rural Appraisal (PRA) exercises and participant observation were carried out over the course of a year to conduct in-depth field research at the local level. This was followed by an analysis of actors and policy processes at the local, district and national levels.

Seasonal out-migration and the feminization of community forestry among the Tamangs

The village of Bhatpole is located in Kabrepalanchok District of Central Nepal. It is predominantly inhabited by 'Tamang' ethnic groups and is located adjacent to settlement hamlets inhabited by other ethnic/caste groups such as 'Jasi-Bahuns,' 'Magars' and 'Chetris,' among others. Tamangs are of Tibeto-Burman origin and constitute one of the largest and most socially and economically marginalized ethnic minorities in Nepal. Tamang households in Bhatpole depend upon agricultural and nonagricultural livelihoods within and outside the village. Because of the dearth of good agricultural land, most households rely on seasonal out-migration to Kathmandu and neighboring towns and cities to supplement shortfalls. Seasonal migration allows them to return to the villages during peak agricultural seasons (such as planting and harvesting paddy) to help out with family farm production and engage in daily waged agricultural work for the wealthy Jaisi-Bahun landlords in the neighboring villages. During this study, the men were generally away for 6 months or longer per year. Although both women and men expressed interest in migrating, seasonal migrants were predominantly male. In Bhatpole, the male-led patterns of seasonal out-migration were not due to gender imbalances at the intra-Tamang level, but rather to the gendered segmentation of the markets for Tamang labor as well as the inability of Tamang migrant networks to tap into gender-inclusive markets. Encouraged by their families, young women and men had previously migrated in equal numbers to work in the carpet industries of Kathmandu, and the ideology of controlling women's movements was virtually absent among the Tamangs. Although health and safety standards for workers were low in the carpet industry, workers were subjected to very little gender-based discrimination in terms of duties assigned and wages paid. After the carpet industry collapsed because of declining export volumes and reduced rates of return in the late 1990s, much of the informal and casual labor demand in towns and cities changed to being specifically for male labor. Tamang networks had little access to other employment opportunities that were able to absorb both male and female workers. Consequently, most women carpet workers had to return to Bhatpole while men continued to find casual work elsewhere.

The allocation of responsibilities for family farm production and domestic work (such as collection of firewood and fodder) was defined by 'availability to work' rather than by gender per se. However, the gender biases embedded in markets for Tamang labor were being transmitted at the intrahousehold level and becoming evident in gender inequalities in the division of labor (such as child care and domestic work). Women became disproportionately dependent on men for material and extralocal support. Women from households where male members were seasonal migrants witnessed significant increases in work burden when men were away. However, rather than being passive spectators, women were also capitalizing on the spaces existing within Taman sociocultural practices and investing in greater cooperation and collaboration with one another in order to mitigate the gender-based constraints that they faced in their everyday lives. This was particularly evident in the way women organized exchange labor of various kinds in family farm production and domestic labor. These were measured, monitored and reciprocated stringently to mitigate against the labor vacuum created during men's absences.

Thus, in Bhatpole, community forestry became a women's-led initiative, with women at the forefront of promoting and supporting it. Community forestry was viewed as a way of addressing the lack of secure and steady access to forest products commonly faced by Tamang women in the absence of men. Collaborating to manage community forestry became a part of and intertwined with ongoing forms of collective effort. Women drew on pre-existing forms of collaboration to discuss and decide on the rules that should govern forests prior to seeking formal handover from the government, and to define men's role in community forestry. Their rules included user eligibility, forest protection, penalties, and which types of forest products were to be appropriated — when and by whom they were to be appropriated were decided upon when women met to make arrangements about exchange labor.

Women feared that involving men, the vast majority of whom migrated seasonally, as equal partners in the community forestry process would significantly increase the costs of participation, would mean broadening the scope of community forestry to meet men's interests and priorities, and would jeopardize the basis for collective action for community forestry governance. At the same time, women also sought strategic support from men in order to liaise with government officials on their behalf and to help them comply with governmental rules and regulations pertaining to the establishment and functioning of community forestry user groups. Women conceptualized their life spaces as being separate from but simultaneously linked to those of men. Their spaces were limited to the local (the village, local market, neighboring villages), whereas men operated in both local and extralocal spaces. Men who seasonally migrated outside the village were viewed as being better able to understand, and interact and bargain with extralocal actors such as forestry officials. As Agarwal (2010) notes, community forestry policies, although implemented at the local level, are framed at the national level and beyond. Women often lack the experience and contacts required to forge extralocal networks and influence institutions at high levels. Furthermore, as Nightingale (2005) points out, in spite of the participatory nature of community forestry policies, the support provided by the Department of Forestry assumes that local people have little knowledge about how to manage community forests and must be taught modern siviculture. These attitudes reinforce differences between users based on education, literacy and gender. In the context of Bhatpole, the 'professionalization' of community forestry led Tamang women to depend on male counterparts with literacy skills and extralocal experiences to act as intermediaries between District Forest Officials and Tamang women users. Men generally agreed to play a supporting role as long as they also benefitted (along with women) from secure access to forest products and would not have to contribute their time and labor to community forestry governance. However, in the process of establishing and managing community forests, new gender hierarchies were created as women relied increasingly on men to act as go-betweens with government officials.

Remittances, class and the invisibilization of women among the Dalits of Gharmi

The village of Gharmi is located in Kaski District in Western Nepal; its inhabitants are high-caste Poudyals and Khatri-Chettris and low-caste Biswa-Karmas (Dalits), with each group occupying its own settlement hamlet. The majority of Biswa-Karma households are dependent on historical patron–client relationships as well as migration outside of the village. The high-castes rely on low-castes as a cheap source of labor and the low-castes on the high-castes for their livelihood. Caste-based practices of untouchability characterize everyday social relations between the high- and low-caste groups. Many also supplemented caste-based systems of livelihood with seasonal migration to the fertile agricultural plains of Nepal and India to take advantage of different agricultural seasons and to find nonfarm employment.

As Gill (2003) points out, however, many rural households (such as those in Gharmi) are dependent on the same type of seasonal out-migration, where demand for laborers does not change, leading to a case of supply outstripping demand in the flat/agricultural countryside of Nepal and India. This means that, in Gharmi, only a handful of low caste households were able to accumulate an adequate or sustained income through migration; these households were actively sending their young men to the Gulf countries for 2–3 years at a time. While this involved much higher costs of migration, it meant considerably greater returns in terms of remittances being sent home. Thus, migration was differentiating the Dalit community along class lines and cementing these divisions. The remittance class were re-investing in the village in the form of land and productive resources, and lowering their economic dependence on caste-based patron–client relations. Furthermore, many were also influenced by the Dalit struggle taking place in Nepal and were instrumental in mobilizing support against caste-based discrimination upon their return to Gharmi.

Even though migration was seen as the only viable option for reducing household vulnerability and increasing the social and economic standing of individuals in the village political economy, migration was not an option for women. Caste-based ideologies such as women's honor and a strict enforcement of gendered division of labor served to control women's mobility outside the household and village. Hence, the fundamental contradictions in the changing context of caste-based relations in the village were that many of the Dalits' sociocultural practices (especially those related to the treatment of women) mirrored high-caste practices and continued to be strictly enforced even as the emerging 'remittance class' was struggling to end caste-based discrimination.

The District Forest Office (DFO)-Kaski handed over the community forests in Gharmi to low-castes after 3 years of fierce dispute between the high and low castes over the usufruct rights to the forests. The initial motivation behind the Dalits' request for the handover of community forests was to gain secure access to forest products and to reduce women's work burden. Biswa-Karma households required forest products such as firewood for cooking, fodder for livestock, organic manure for agricultural production and timber for construction purposes. Collection of forest products was associated with locally defined perceptions of being female and was therefore considered women's responsibility. These demarcations were strictly observed and any transgressions severely reprimanded. In addition, a bitter caste-based battle ensued when the high-castes contested the handover on the grounds that their lineage deity (kul Deota) was located in the forest and that Biswa-Karmas were barred from entering the 'sacred' forests because of locally defined and customarily sanctionedpractices of untouchability.

In response, the senior and powerful men within the Biswa-Karmas, who were also least dependent economically on caste-based patron–client relationships because of the remittances they were receiving from their sons and brothers who had migrated to the Gulf, employed community forestry as a vehicle and platform to launch a caste-based struggle. Discourses over 'equality,' 'rights' and 'citizenship' — which were gaining currency in the newly democratic Nepal — were employed to garner support for the movement and win alliances with politicians in the district and with key movers and shakers in the DFO. In addition, the community leaders (who were also members of the remittance class) went to great lengths to portray a 'unified Biswa-Karma' voice against the high-castes, and put considerable social pressure on the women and the poorest members of the Biswa-Karma community to ensure that they participated in the struggle too.

By the time community forestry was handed over to the Biswa-Karmas, the struggle over community forests had far-reaching extralocal consequences. Numerous external actors, such as the police, politicians and senior officials in the DFO-Kaski were involved in mediating the struggle. The story of the 'struggle of the powerless Dalit community for their rights to access forests' had made headlines throughout the district. Consequently, the governance of community forestry was not merely about securing access to forest products, but had transformed into a village-wide public affair that brought with it extralocal recognition and the flow of development aid. The senior and most powerful members had a vested interest in maintaining control over community forestry and showcasing the community forest as a model of sustainable management. The community forestry committee — a major decision-making body — was reserved for senior men involved in the caste-based struggle Women were not only excluded from the decision-making process, but the rules that were developed focused on protecting forests rather than sustainably utilizing them so as to meet women's basic needs.

Conclusion and policy implications

This InfoBrief has attempted to draw attention to migration (intra- and international) as an integral factor shaping social change and questioning the present approach to the governance of forests in developing countries such as Nepal. The case of Bhatpole has demonstrated the ways in which the predominance of male out-migration shaped intrahousehold dynamics and contributed to the 'feminization of community forestry governance.' By contrast, in the case of Gharmi, male migration contributed to the creation of a 'remittance class,' which used community forestry as a platform on which it waged a caste-based struggle, thereby further entrenching inequalities along lines of gender, class and seniority.

The policy implications of taking migration seriously involves revising the inherent assumption of the physical and social boundedness of rural communities and promoting a larger dialogue among all stakeholders to identify the opportunities and challenges of governing forests in the context of multilocal livelihoods. At the local level, it involves empowering frontline agents to recognize the gender dimensions of migration patterns and to strategically negotiate for greater participation of women and/or to capitalize on opportunities that already exist to further promote them. But this also necessitates a broader re-orientation within forest bureaucracies on gender issues and the importance of embracing participatory approaches in practice.

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[PL3-3]

Women forestry worker's work pattern and wage in Japan

Akie Kawasaki[1]

1 Introduction

From the 1990s onwards, working conditions of forestry workers have improved remarkably (Kawasaki and Kohroki, 2013). However, it is apparent that the status of women workers in the industry is not equal to that of men. This paper seeks to shed further light on the reason for this inequality.

In Japan, the concentration of population in large cities is increasing continuously, with 67% of the population living in urban areas in 2010, which form only 3% of the total land area of the country. Only 14% of the population lives in mountainous area, where forestry operation mainly conducted. Due to these background factors, the number of forestry workers has decreased rapidly, from 206 thousand in 1970 to 47 thousand in 2005 (Figure 1), and the aging rate of the population involved in the industry has also grown rapidly from 1985 to 2005. In response to the situation, training projects for new employees were launched in 2003, after which, the total number of workers in the industry has increased from 2005 to 2010, and there has been a decrease in the aging rate of the workers.

The organization of this paper is as follows. Section 2 specifies the materials used for the paper. Section 3 states the changes in the situation regarding the standing of women employed in the forestry industry. Section 4 studies the wage structure of women in comparison with men, using both nationwide data and a case study of two firms. Section 5 offers concluding remarks.

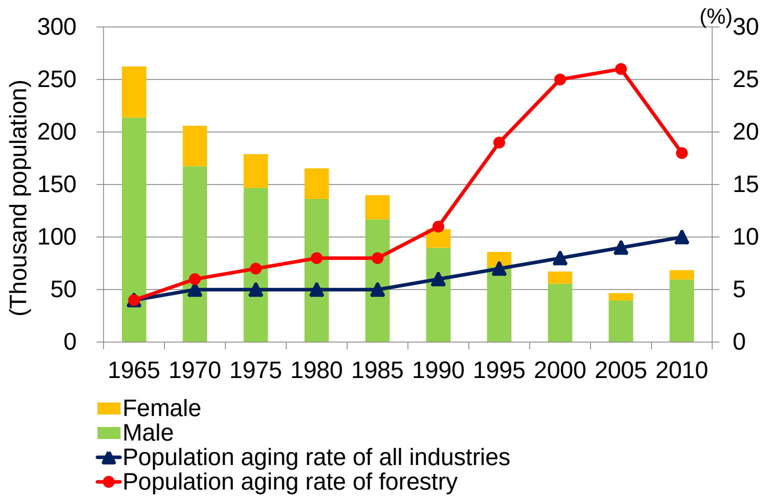

Figure 1: Demographics of forestry workers in Japan
Source: Population census, Japan

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2 Purpose & Materials

The Purpose of this paper is to clarify the current condition of women in forestry and analyze discrimination in wages and functions.

Materials are the statistics provided by the national and local governments: Population census (1990-2010), Forestry census (1990-2010), Wage census (1990-2010), Price and wage census in agricultural area (1990-1995), Survey about wage in agriculture (2005-2010), Statistics of forest owners' co-operatives (1990-2010) and Forest owners' cooperatives in Miyazaki Pref. (1990-2010). Due to the limitation of statistics, Average wage of forestry workers are calculated as:

$$\text{Average wage} = \left(\sum_{n=1}^{\infty} Wn \times Pn\right) \times \frac{1}{\sum_{n=1}^{\infty} Pn}$$

W= wage class, P= population of wage class

3 Situation of Women Forest Workers

As Figure 2 shows, the number of female forestry workers has decreased, following the overall trend of the forestry worker population. When it comes to the ratio of female workers, it dropped by about 10% from 1960 to 1970, went up from 16% to 18% during 1970 to 2000, and dropped again from 15% to 13% from 2000 to 2010. The total population of forestry workers increased from 2005 to 2010; therefore, it is clear that more female workers have left the industry, as compared to male workers.

Figure 3 shows the composition ratio of employment status of female workers. It is obvious that women had played an important role as family workers under the afforestation policy of the forest agency during the 1950s and the 1960s. The work pattern of female workers has since changed. While 65% of the total female workers were family workers in 1960, the rate of family workers has dropped to 20% in 2010. In contrast, the proportion of employees made up 72% of the women in forestry in 2010, with the ratio of directors increasing steadily since 1990.

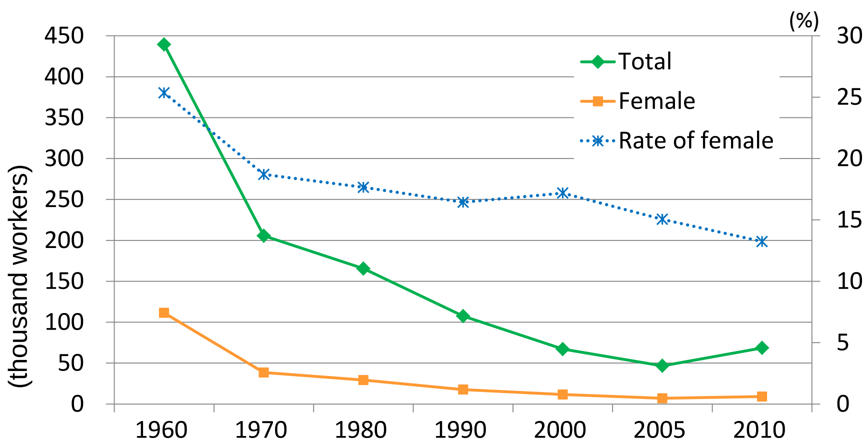

Figure 2: Number of female forestry workers in Japan

Source: Population census, Japan

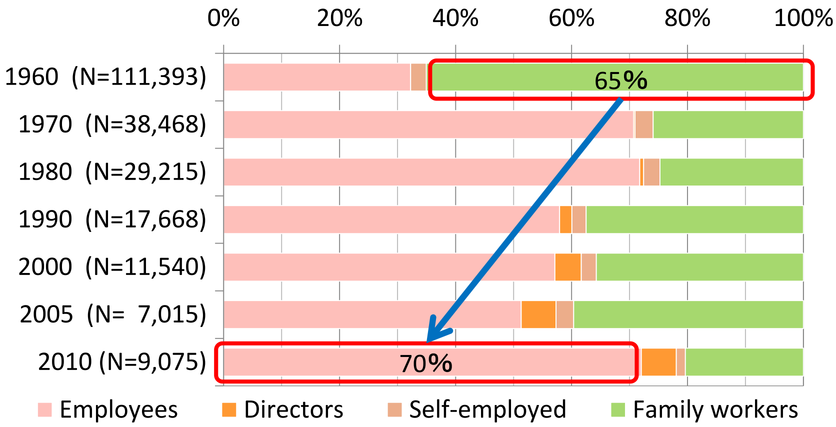

Figure 3: Composition ratio of the employment status of female forestry workers

Source: Population census, Japan

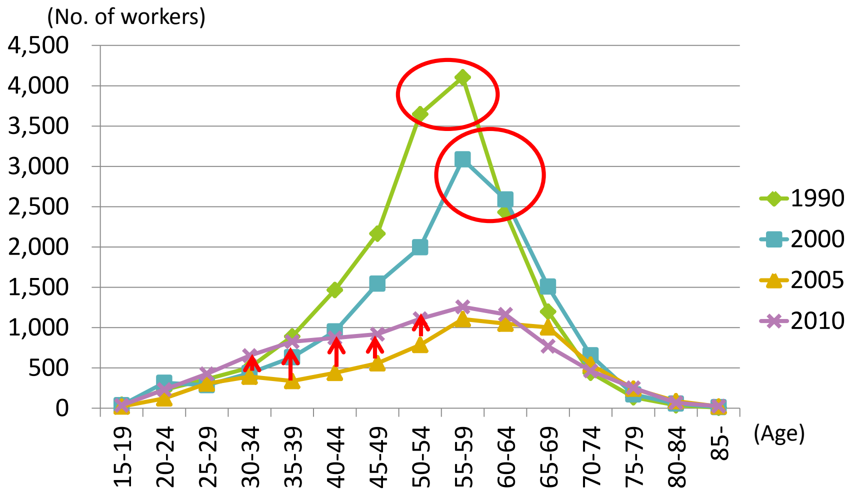

Figure 4: Age of female workers

Source: Population census, Japan

Figure 4 shows the population of female workers by age strata in 1990, 2000, 2005, and 2010. The peak age stratum is 55-59 years old (y/o) in the given year, however the major age strata has shifted from 50-54 y/o and 55-59 y/o in 1990, to 55-59 y/o and 60-64 y/o in 2000. From 2000 to 2005, female workers have decreased in number and aged, the major age strata has shifted to 55-59 y/o and 65-69 y/o. In opposition to the trend from 1990 to 2005, the major age strata has shifted back to 45-49 y/o and 60-64 y/o in 2010, while the ratio of workers below 40 y/o has risen from 12% in 2000 to 24% in 2010.

4 Wages

4.1 Nationwide analysis

Forestry workers' wages are analyzed with the statistics from the Forest Owners Cooperative (FOC), due to the limitation of statistics about forestry workers' wages. FOC members' forest covers 69% of the forested land, members are private owners; households, companies, religious institutions, community forest programs, and so on, and local governments. Wages of short-term workers are analyzed in this paper, with most of them being day-rate workers in forestry and agriculture. Time-rate workers are included in other industries.

First, the populations of workers of the FOC are shown in Figure 5, differentiated by the major activities. Harvesting includes commercial thinning, final cutting, and transporting of logs, while silviculture involves nursing operations such as planting, cleaning, pre-commercial thinning, and so on. The share of female workers in harvesting has decreased from 4% of the total workers in 2001 to 2% in 2010, and from 18% in 2001 to 5% in 2010 in silviculture.

Figure 6 shows the wage gap between male and female workers, by industry. First, female workers earn 75% of what male workers earned in 1990, on average, in all industries. The gap has been smaller on average in all industries, agriculture, and forestry since 1990, with female workers earning 90% of wages earned by men in 2010 in all industries. However, the wage gaps are still larger in agriculture and forestry when compared to all other industries, where females earned 85% of wages earned by males in agriculture and 75% in forestry in 2010.

Though wage inequality persists, the wage gap between men and women has become smaller on average in forestry. When looking at the wage gap by operation in Figure 7, women working in harvesting had earned 65% of men's wages in 1990, with this figure rising to 72% in 2010, wages of women in silviculture has increased from 72% in 1990 to 78% in 2010.

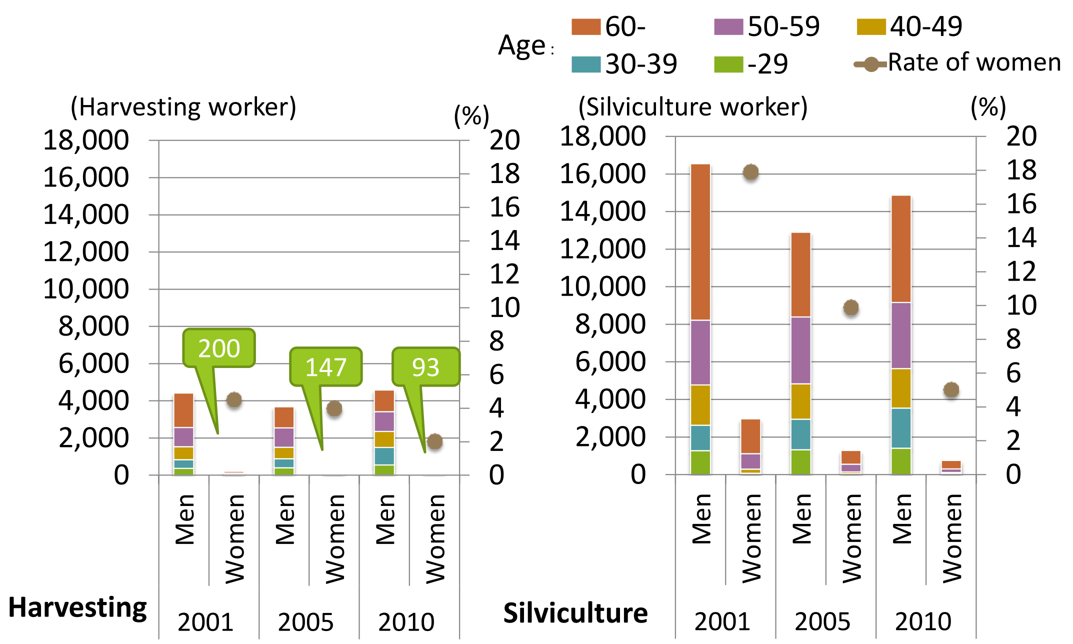

Figure 5: Workers in Forest owners' cooperatives by operation

Source: Statistics of forest owners' co-operatives (1990-2010)

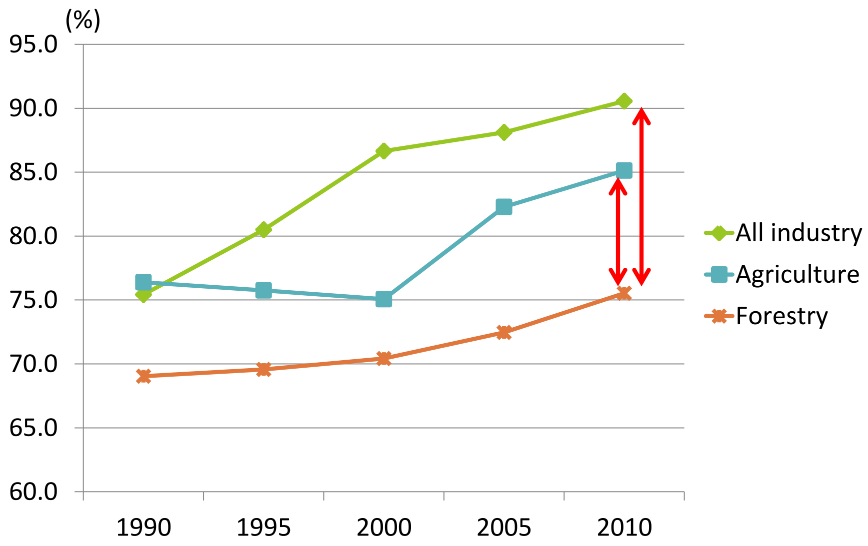

Figure 6: Wage gap between males and females by industry

Source: Wage census (1990-2010), Price and wage census in agricultural areas (1990-1995), Survey about wage in agriculture (2005-2010), Statistics of forest owners' co-operatives (1990-2010)

Note: Wage gap (Male wage=100%)

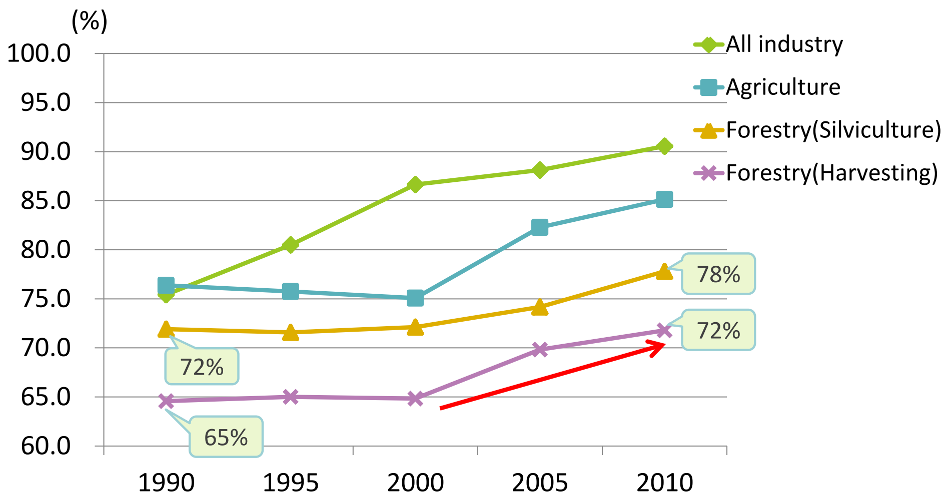

Figure 7: Wage gap between males and females by operation

Source: Wage census (1990-2010), Price and wage census in agricultural areas (1990-1995), Survey about wage in agriculture (2005-2010), Statistics of forest owners' co-operatives (1990-2010)

Note: Wage gap (Male wage=100%)

4.2 Case studies

The cases of two FOCs from the Miyazaki prefecture, located in the middle-east of Kyushu Island, Miyakonojo FOC and Mimikawa FOC, are analyzed here. Figure 8 shows the wage gaps of the two FOCs' female workers engaged in silviculture and harvesting. When it comes to the wage gap in silviculture, female workers earned 84% of their male counter-parts wages in 1990 and 86% in 2010 for Miyakonojo FOC, the corresponding figures are 77% in 1990 and 85% in 2010 for Mimikawa FOC. This describes the fact that the gap in silviculture has become smaller.

However, when it comes to harvesting, it is difficult to figure out a clear pattern on both FOCs. Table 1 shows the number of workers of the two FOCs' workers by gender and by activity. The major conclusions drawn from these results are as follows: first, female workers are very few in number in both types of work. Second, since harvesting workers are paid on a piece rate salary, which is then converted to a time-rate salary for the statistics, the wages can be easily changed to reflect the conditions of the workers and harvesting site.

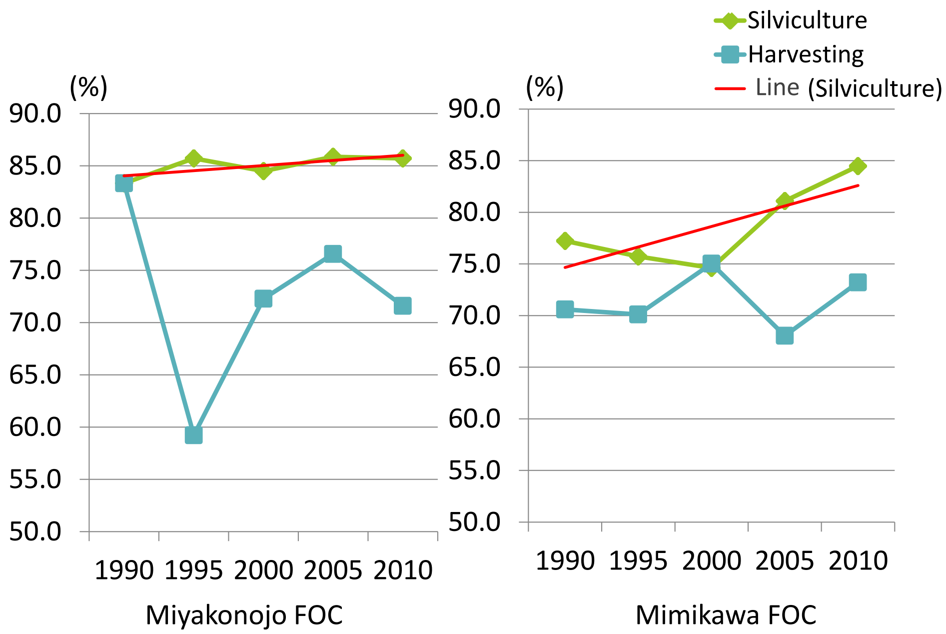

Figure 8: Wage gaps of FOCs in Miyazaki Prefecture

Source: Forest owners' cooperatives in Miyazaki Prefecture

Note: Wage gap (Male wage=100%)

Table 1: Number of workers

Mimikawa FOC

	Harvesting		Silviculture	
	Men	Women	Men	Women
2010	122	4	164	15

Miyakonojo FOC

	Harvesting		Silviculture	
	Men	Women	Men	Women
2010	35	7	43	1

Source: Forest owners' cooperatives in Miyazaki Prefecture

5 Discussion and Conclusion

As described above, both male and female worker populations in forestry are decreasing, however more female workers have left the industry as compared to their male counterparts. The work pattern of females has also changed, from being composed mostly of family workers to now being mostly employees from 1960-2010. The age of female workers in the industry has consistently gone up from 1990 to 2005; however, the ratio of females below 40 y/o has risen up from 12% in 2000 to 24% in 2010.

Wage gap between males and females in forestry seems to have decreased; however, there is still a large gap when compared to other industries. The wages in harvesting are consistently 6-7 points lower than comparative wages in silviculture from 1990 to 2010. Case studies of forest owners' cooperatives are difficult to analyze, due to the small number of female workers and wage patterns. For further study, it may be better to analyze on a larger scale, such as prefecture wide figures of employment in the industry.

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[AS1-1]

Biodiversity-oriented planning and management of Finnish small-scale forests

Overcoming the challenges of fragmented land and poor cost efficiency

Teppo Hujala[1], Mikko Kurttila[2], Jouni Pykäläinen[3] and Lauri Saaristo[4]

1 Introduction

Forestry land coverage in Finland is 26 million hectares, which corresponds to 86% of the total land coverage; the share of protected forests and forest areas in restricted use equates to 13% of the forestry land (Finnish Forest Research Institute 2012). The Finnish forest nature conservation strategy has mainly relied on strictly protected forest conservation areas and managed forest areas where biodiversity aspects are routinely taken into account in planning and conducting forestry operations (Lier and Parviainen 2013).

To hasten the safeguarding of forests' nature values, Finland has established the Forest Biodiversity Programme METSO 2008–2020 (Government Resolution… 2008). The METSO programme aims to halt the on-going decline in the biodiversity of forest habitats and species and to establish stable favourable trends in southern Finland's forest ecosystems. With monetary compensation for voluntary conservation agreements and improved communication between authorities and land owners (see Kumela et al. 2012), METSO has achieved new conservation contracts for some 47,000 hectares of forest in the 2008–2012 period (Syrjänen et al. 2013).

As a third pillar of forest nature conservation, to complement the policy portfolio (cf. Doremus 2003) of the protection areas and the by-law requirements in forestry operations, Finland also makes efforts to enhance the use of biodiversity-oriented forest management practices in managed forest areas. Biodiversity-oriented management of forests comprises all operations which aim to actively maintain or increase forests' nature values; it pursues improvement in the connectivity between conservation areas and other valuable habitats, e.g. by increasing the amount of deadwood in forests or by utilizing extended buffer zones near streams.

Private small-scale forestry accounts for 52% of forestry land in Finland (Finnish Forest Research Institute 2012) and deals with 630,000 forest owners (Leppänen and Sevola 2013). Forest owners hold a key role as customers of services concentrating on forests' nature values. Recent studies have evidenced a potential growth in interest towards such services: roughly one tenth of Finnish family forest owners would like to emphasize biodiversity-oriented management throughout their forest property (Hujala et al. 2010) and in northern Finland, some quarter of owners have been classified as conservationists who appreciate biodiversity, multiple-use forestry and mental nature experiences (Hallikainen et al. 2010).

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When making decisions on how to manage individual forest stands and larger parcels, the aims of biodiversity-oriented forest management need to be contemplated so that biodiversity is seen as one objective of forest ownership among others, such as wood production and recreation. Numerical forest planning enables, for example, the use of a biodiversity indicator (Kangas and Pukkala 1996) as a quantitative objective in planning calculations together with other (economic) objectives that are relevant to the forest owner. Thus far, however, biodiversity-oriented forest planning and management has not become a prevalent practice in Finland (Kumela et al. 2012).

This study sets out a multi-level action model for planning and conducting biodiversity-oriented forest operations in small-scale family forests. As well as the main components of the action model, the crucial steps needed to put it into practice in Finnish conditions are assessed. General viewpoints about such institutional and inter-organizational change conclude the assessment.

2 Materials and methods

The study employs a theoretical framework of complex adaptive systems and transition management (Rotmans and Loorbach 2009, van den Bergh et al. 2011). This approach underlines that smooth transition involves cyclical activity at different levels: compiling a macro-level vision and attractors and setting out micro-level experiments and selecting successful ones to scale up. Figure 1 below presents the transition management cycle, which frames the research perspective, i.e. the viewpoints assessed to reach enhanced biodiversity-oriented forest management.

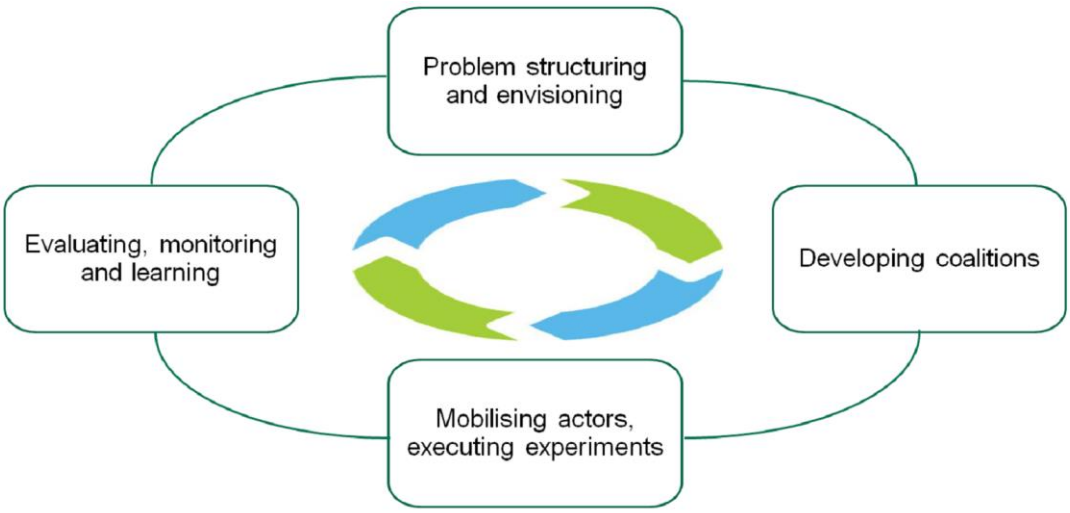

Figure 1: Transition management cycle (adapted from Rotmans and Loorbach 2009)

The base logic of the proposed action model is formulated via qualitative analysis of the reports of recent developmental projects in biodiversity-oriented forest management, policy evaluation reports and related research articles. Furthermore, an online questionnaire for biodiversity conservation professionals (n=97) is used to shed light on the practitioners' views on the crucial development steps.

3 Results

3.1 Current situation in Finland

The Finnish practice of increasing nature values in small-scale family forests faces challenges of parcelized ownership and poor cost efficiency. The total number of family forest holdings in Finland is 375,000, among which the number of small forest holdings (here: less than 10 hectares) has been increasing (Leppänen and Sevola 2013). As the planning of forest management operations is very rarely done at the holding level (Kurttila et al. 2013), it is evident that biodiversity-oriented management and its planning mainly takes place at the stand level. Holding-level approaches, linked with landscape- and regional-level prioritisation activities, would improve connectivity and cost efficiency. In practice, cooperation in biodiversity management across holding borders is not common (Rämö et al. 2012) and happens only in some special projects which run occasionally in rather small areas. Consequently, high unit costs decrease forest owners' motivations for biodiversity-oriented management. At present, both the supply and demand of biodiversity-oriented planning services is scant (Kumela et al. 2012).

Slow development of forests and resulting long rotations often mean that management operations do not occur regularly. There is thus a need to get away from irregular and arbitrarily planned biodiversity management operations and move towards a more systemic approach in which biodiversity-oriented planning and management would be an integral and equal part of forestry among other aims and practices (see Kumela et al. 2012).

In the 2008–2012 period nature management was conducted for some 2,500 hectares of private land (Syrjänen et al. 2013). The most recent METSO evaluation report (Laita et al. 2012) suggested paying more attention to the planning and incentives of biodiversity-oriented forest management. Indeed, commercial forestry service providers will have an increasing role in the biodiversity-oriented forest nature management that is funded by the METSO programme. Following a recent pilot project (Kotiharju 2013), this will be implemented by establishing an orderer–producer model, in which public bodies prepare regional nature-management project plans and open calls are used to select private companies to implement the operations. It means that these organizations have a sound reason to improve their capability and knowledge in biodiversity-oriented management practices. The actual change process of institutional adaptation, however, is challenged by competing attitudes, social norms and technical guidelines and prevailing knowledge practices (Primmer and Wolf 2009, Primmer and Karppinen 2010).

3.2 Practitioners' views

The survey respondents (Table 1) represented nationwide experience in biodiversity maintenance and a variety of relevant organizations from the public, private and third sectors. The mean experience of the respondents in biodiversity-related matters was 10 years, ranging in total from 0 to 30 years. However, biodiversity-oriented forest management typically only accounted for a small share of duties: for 72% of respondents it accounted for less than 25% of total working hours.

Table 1: Responses of practitioner survey on biodiversity-oriented forest management (n=97)

Background organization	**Share (%)**
Forest owners' associations	40
Forestry Centre (forestry administration)	22
ELY-Centre (environmental administration)	12
Non-governmental organizations	12
Private companies	7
Metsähallitus (State forest enterprise)	6
Total	**100**

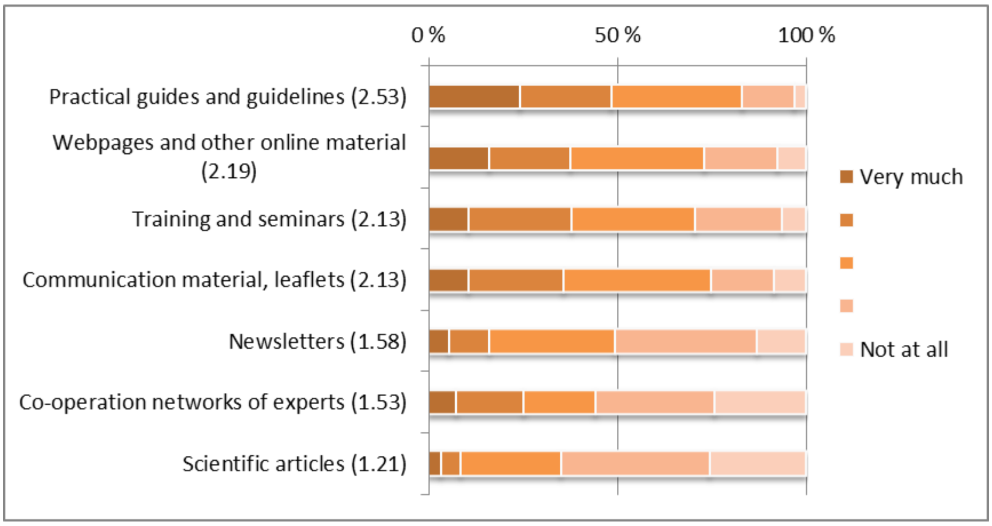

Figure 2: Biodiversity-related information sources and materials used at work (n=93–97). Figures after category legends show weighted averages of the given scores 0–4

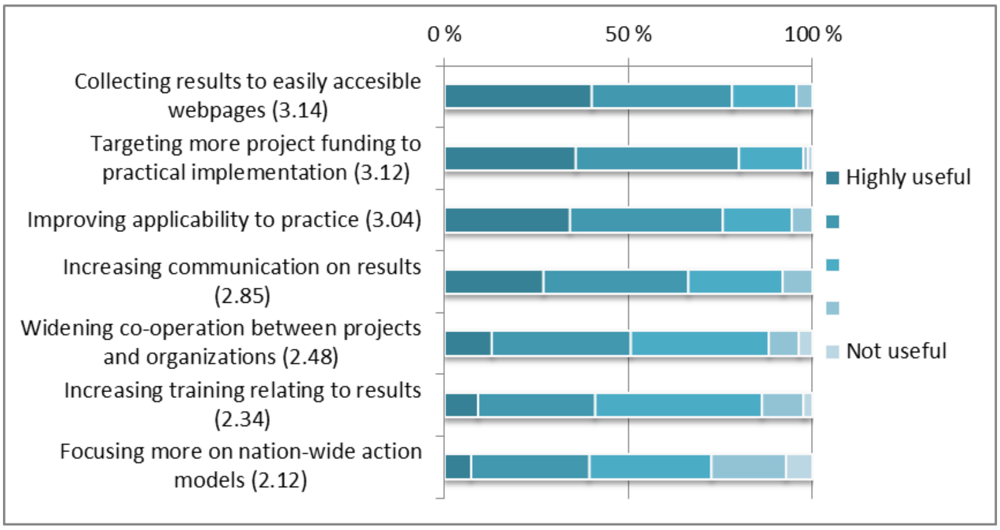

Figure 3: How to enhance the applicability of the results of developmental projects relating to biodiversity-oriented forest management (n=91–97). Figures after category legends show weighted averages of the given scores 0–4

The survey responses revealed that practical guides and online material are the most commonly used information sources (Figure 2). The most preferred means to transfer the results of development projects into wider practice are collecting easily applicable information to webpages and supporting practical implementation with extra funding (Figure 3).

3.3 Components of the enhanced action model

Forest biodiversity has important and recognized positive externalities, but no proper markets. Therefore, it appears evident that in order to achieve forests' full value to society, some kinds of incentives are needed to accelerate biodiversity-oriented forest management (Glück 2000, Mayer and Tikka 2006).

The proposed action model combines regional and landscape-level perspectives with owner-driven holding-level planning of biodiversity-oriented forest management. It appreciates landowners' decision-making situations while pursuing cross-boundary activity. Furthermore, it fosters implementation with information-sharing among service providers and a combined subsidy and tax-reduction scheme. According to this vision, biodiversity-oriented management is seamlessly integrated with profitable everyday forestry.

The essential components that need to be developed for the new action model are as follows:

- creation of a clear connection between the knowledge regarding forests' biodiversity values and market-based holding-level forest planning in which the goals and use of all forests of the holding are simultaneously considered, e.g. through a 'green forest plan' and related development of forest planning services (see Hujala et al. 2013) and forest planners' skills (see Hokajärvi et al. 2011);
- adoption of a new regional planning approach for private forest planning that allows the recognition of regionally important biodiversity objectives and ways and means to pursue them; to this end, open data about forest biodiversity resources should be analysed in each region with the Zonation conservation prioritisation software (Moilanen et al. 2012);
- improved connection between the tactical planning of biodiversity-oriented forest management and the implementation of planned forestry operations, developing easy-access services for land owners and entrepreneurs for combined operational planning and implementation based on tactical plans (see Hujala et al. 2010);
- financial support to 'green forest plans' by means of establishing a public–private cost-sharing mechanism in which publicly funded biodiversity-related expertise may be invited, as a distinct component, to contribute to the market service of forest planning; and
- enhanced communication of regionally important biodiversity values; regionally targeted marketing of biodiversity-oriented forest management planning and operations to land owners in the context of compiling regional nature-management plans and preparing for the call for contractors (see Laita et al. 2012).

In the enhanced situation, information flows and operational logistics are streamlined so that it makes sense both to the forest owner and to the public and private service providers to get engaged and take action in biodiversity-oriented forest management (Figure 4). Popularized communication and public discussion about the increasing nature values of forests plays an important role in raising general awareness and increasing the demand and supply of biodiversity-oriented services. Prioritisation analyses and green forest plans serve the regional nature-management plans, the implementation of which is integrated with everyday forestry.

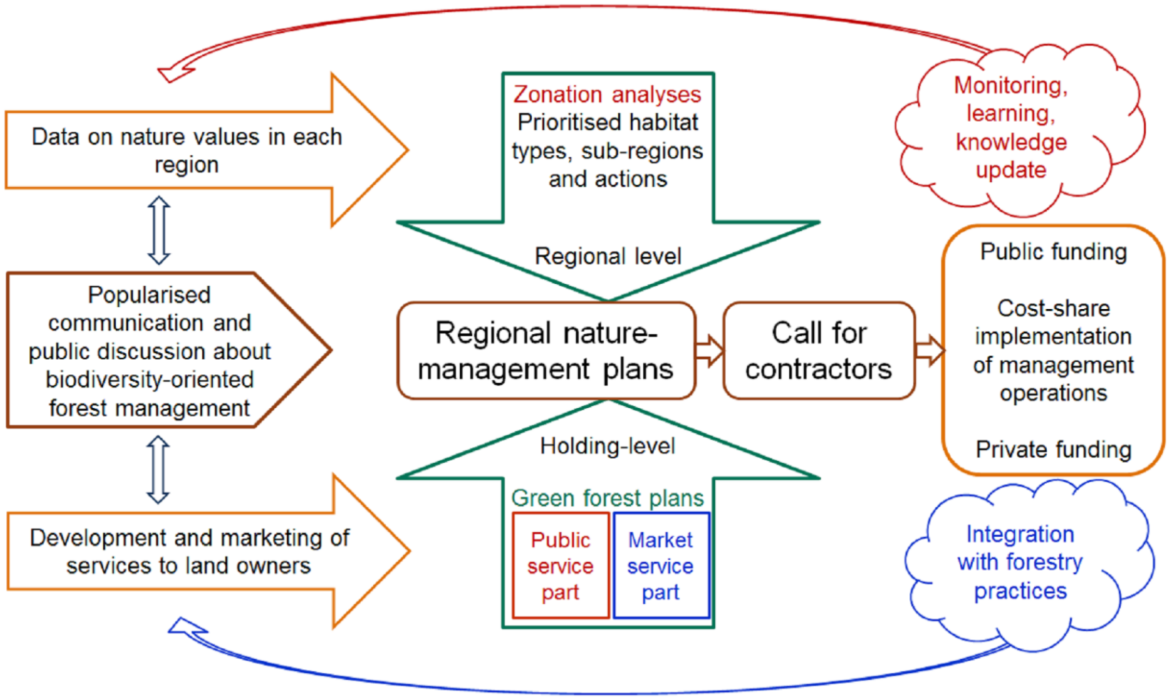

Figure 4: Illustration of the information flows and activities contributing to the biodiversity-oriented forest management

4 Discussion

4.1 Facilitation of meaningful change

Both the theory of transition management within complex adaptive systems (Rotmans and Loorbach 2009) and the Finnish practitioners' opinions (Figure 4) stress that practical action is crucial to meaningful change. The theory and practice further imply that instead of considering practitioners as targets of information or adopters of new actions, they should be regarded as active subjects of trials that will bring root-level experiences of modified alternative courses of action into contemplation. From this perspective, rather than a ready-made implementation model, the above outlined view of biodiversity-oriented forest planning and management should be taken as an initial frame for further communication and as a starting point for designing small practical experiments and pilot projects that would test and iteratively develop the components of the action model. To safeguard open and wide communication and the dissemination of good solutions to policy, research and wider practice, the following steps are recommended:

- research–practice workshops in which the action model is put into a severe test with practice experts and feedback contributes to the enhancement of the model;

- development of methods to find the most cost-efficient areas for biodiversity-oriented forest management by using forest inventory data and ecological decision analysis tools (e.g. the Zonation programme);
- regionally scattered pilot projects, which i) test the information flows and operation logistics and ii) serve dissemination and technology transfer purposes;
- input to policy-making processes by means of analysing and explicating the justification and *ex ante* effectiveness of proposed policy instruments; and
- specific marketing of biodiversity-oriented forest management by means of popular articles, online material and printed leaflets and guides delivered in training events.

4.2 Critical success factors and potential bottlenecks

Hitherto, the possibilities and importance of managed forest areas for biodiversity protection have not been fully recognized among forest owners, forestry professionals and nature conservation governance. In practice, when implementing timber harvestings, biodiversity is considered by applying the same methods equally everywhere. Still, many people tend to think that biodiversity-oriented operations, if needed at all, can be meaningful only within the forest conservation areas. For example, the governmental funding of the METSO programme is strongly biased towards actions for increasing the total area of strictly protected forests, i.e. the first pillar of the policy portfolio. Without questioning the invaluable baseline importance of strictly protected areas for biodiversity conservation, we should also put more effort into developing ways to increase biodiversity within managed forest areas to develop a well-functioning conservation network including different forests. Intellectual and monetary resources invested in nature-value enhancement in managed forests are evidently crucial success factors for the future.

The demand and supply of 'green forest plans' constitute another potential bottleneck in increasing biodiversity-oriented forest management. Although forest owners have been diversifying and urbanizing, nature-values oriented planning services have remained marginal. It may be that forest plans constitute such a strong discourse institution connoting to traditional wood-production-oriented planning that potential green plan customers simply do not find forest plans attractive. Hence, green forest plans should probably be re-invented to represent a new wider planning frame. One candidate for such a frame is the concept of ecosystem services, which has the potential to raise biodiversity, water quality, carbon balance etc. as objectives of planning.

The necessity of modifying policy instruments to enable cost-sharing and public–private partnerships in planning and conducting biodiversity-oriented forest management is a critical issue. Without policy support, i.e. coherent rules, regulations and subsidies, the proposed action model is susceptible to fail in its attempt to attract service providers and forest owners to act accordingly. A comparable threat can be seen in practical forestry organizations' slow adoption of new working principles, which may significantly decelerate the diffusion of good pilot experiences.

To induce and sustain an iterative inter-organizational learning process towards enhanced biodiversity protection practices, the political nature of transition processes needs to be acknowledged and the diversity of actors needs to be nurtured (see Grin 2012). In the Finnish context, this means that not only researchers and developers but also forest owners, entrepreneurs and policy-makers are important participants in workshops and pilot projects. Further, the facilitation of this kind of process, where some actors gain more working space and others may lose some of their position, must include proper power and value position analyses. The role of open good-quality communication is evidently an invaluable asset in maintaining the legitimacy of, and proactively positive attitudes towards, the on-going change process.

4.3 Conclusions

This paper has argued for a facilitated transition towards an enhanced action model of planning and conducting biodiversity-oriented forest management in Finnish small-scale private forests. Biodiversity-oriented forest management may play an important role as a third pillar of the nature conservation portfolio alongside conservation areas and statutory regulations. The Forest Biodiversity Programme METSO 2008–2020 serves as a sound frame for developing good new practices. Biodiversity-oriented forest management may be enhanced via popular communication, designing holding-level green forest plans with publicly and privately funded components and developing further a routine of preparing regional nature-management plans followed by open calls for contractors and region-wide implementation practices. The action model presented in this paper may serve as a framing starting point, and further development requires practical trials and pilot projects and active participation of a diverse group of actors. Policy support will be crucial and so will be sufficient resources for further actions.

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[AS1-2]

How Agricultural and Forestry Extension Services Contribute to an Inclusive Extension System in Northwest Pakistan

-A case study of Mansehra and Swat districts of Khyber Pakhtunkhwa Province-

Raheel Saqib[1] and Satoshi Tachibana[2]

1 Introduction

Extension is the diffusion of applicable information and advice to rural community farmers (Agbogidi and Ofuoku, 2009). Extension services use educational methods to help farmers help themselves. In other words, extension education is a voluntary type of education for farmers outside of school and college (Onumadu et al., 2001). The agriculture and forestry sectors are generally considered parallel activities wherein different institutions are working for their development. Effective collaboration among different institutions working for similar purposes is essential for the achievement of the desired goals (FAO, 1996).

In the agriculture sector, provision of services to the farming community in order to improve its agricultural productivity and to improve livelihoods on a sustainable basis is the prime responsibility of agricultural extension (Kibett et al., 2005). Forestry extension programs are designed to meet the needs of small-scale producers in forested area through agro-forestry techniques. With special reference to forest policy, first and foremost, in 1991, the Pakistani government appointed forest extension workers to promote farm forestry (Baig et al., 2008). Despite its leading importance in sustaining the livelihoods of forest growers, there are weak linkages around the world among different components of agriculture (Sharma, 2003; Mubangizi et al., 2004).

The agriculture sector contributes 21.8 % of GDP, employs 45 % of the labor force (GoP, 2011) and comprises a 66 % share of exports (GoP, 2010-11) in Pakistan's overall economy. Because Pakistan is an agrarian economy, major changes in the agricultural system are necessary to solve the problem of food security. This challenge can be met by maintaining the sustainability of the farming system by making effective use of the knowledge and information that is available from or can be generated by several different information sources, such as research institutes and extension departments. On the other hand, forests and planted trees in Pakistan cover approximately 4.6 million hectares, which is equivalent to 4.8 % of the total land area (GoP 2005). Forest make considerable contributions that serve productive, protective, regulative and socio-cultural functions in Pakistan’s economy (Ali et al., 2006).

Public sector agricultural extension services have been criticized rigorously for their poor efficiency (World Bank, 2006). These rural advisory services have a mandate to transform the livelihoods of rural

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dwellers through effective linkages with sister organizations or departments (Ifeanyi-obi et al., 2012). Weak institutional linkages in the agriculture sector are responsible for the poor performance of agriculture in Pakistan (Farooq and Ishaq, 2005). A similar situation also exists in Pakistan with forestry extension services, which face problems of weak linkages with agricultural extension and other allied state departments (Jan et al., 2008). Among these institutional problems, the lack of coordination between institutions (local government and the forestry department) is regarded as the most important (Babar et al., 2008). In an agrarian economy, there must be a well-balanced relationship between agriculture and forestry extension ervices in order to increase productivity and maintain forest resources well enough to avoid environmental disturbances. In light of this relationship, the present study was conducted to explore the common areas of practice for forestry and agricultural extension services and also to identify the factors hindering the effectiveness of extension services provided by the agricultural and forestry extension system.

2 Materials and Methods

The Khyber Pakhtunkhwa Province, previously known as the North-West Frontier Province (NWFP) of Pakistan, was chosen for the present research project because of its fertility in terms of agriculture and forestry. A multi-stage sampling technique was used to select the required sample (Cochran, 1977). In the first stage, from within Khyber Pakhtunkhwa, two districts (Mansehra and Swat) were purposely selected. In the second stage, from within each of the two districts, two tehsil were selected on the basis of maximum deployment of extension field staff from agricultural extension and forestry extension services. The sample size was the whole population of extension staff working in the area, i.e., 48 respondents (24 from each). The data were collected through a comparative survey during August and September, 2012. Qualitative and quantitative social science research methods were used in this study. For the collection of primary data, a well-structured interview schedule was developed and pretested as a research instrument (Cho, 2002). A 3-point Likert scale was used to classify the frequency of the extension services offered for crops, trees and fruit trees by agricultural and forestry extension workers. The quantitative data were analyzed using the Statistical Package for Social Scientists, SPSS (Davis et al., 2004). A descriptive analysis was used for frequencies, means and standard deviations (Eck and Torres, 1996; Ogunjuyigbe, et al., 2005; Lodhi et al., 2006). Graphical diagrams based on the nature of the data were also obtained. The Wilcoxon-Mann-Whitney t-test (for an independent nonparametric sample) was also used to find the association among the areas of practices and the extension activities performed by agricultural and forestry extension services separately. The same method was also used to identify the common areas of practice among agricultural and forestry extension services.

3 Results

3.1 Demographic Characteristics

The demographic characteristics of the individuals working in field-related jobs such as agriculture, and forestry are of primary importance (Hassan, et al., 2002). The data in Table 1 show the demographic characteristics of the respondents. In the age category, 45.8 % of agricultural extension workers were classified as middle age and 75.0 % of forestry extension workers were classified as old age, constituting a majority. The mean age of the respondents was assigned values of 2.13 and 2.75, with SD 0.741 and 0.608 for agriculture extension and forestry extension, respectively. The education level of the extension workers is also an important characteristic for meaningful progress towards national goals (Gibson and Brown, 2003). Seventy-five percent and 62.5 % of respondents had a diploma in agriculture and forestry, respectively, in the area studied. Only 16.7 % of respondents from both extension services held professional masters and bachelor's degrees in an agriculture- or forestry-related subject. The mean values for the education category are 2.75 and 2.92, with SD 0.847 and 0.881. The data regarding position reveal that a large proportion of the respondents were lower-ranking field staff, i.e., Field Assistants (70.8 %) and Block Officers and Forest Guards (75.0 % collectively) from agricultural and forestry extension services, respectively. They are considered front-line agents, as they have frequent contact with the target community and are locally based. The mean values for the position of the respondents are 2.75 and 2.13, with SD 0.944 and 0.797. The results in Table 1 demonstrate that a simple majority (58.3 %) of the respondents from agricultural extension services had 1-10 years of experience and that half (50.0 %) of forestry extension service respondents had 30 years of work experience. The mean values for work experience are 1.88 and 3.33 with SD 1.191 and 0.963.

3.2 Extension Services

Table 1: Distribution of Respondents according to Demographic Characteristics

	Agricultural Extension					Forestry Extension				
FACTORS	Category	Frequency	%	Mean	SD	Category	Frequency	%	Mean	SD
Age	Young (16-30)	5	20.8			Young (16-30)	1	4.2		
	Middle Age (31-45)	11	45.8	2.13	0.741	Middle Age (31-45)	5	20.8	2.75	0.608
	Old (46 and above)	8	33.3			Old (46 and above)	18	75		
	Total	**24**	**100**			**Total**	**24**	**100**		
Education	Masters	4	16.7			Masters	3	12.5		
	Bachelors	0	0			Bachelors	1	4.2		
	Diploma	18	75	2.75	0.847	Diploma	15	62.5	2.92	0.881
	Certificate	2	8.3			Certificate	5	20.8		
	Total	**24**	**100**			**Total**	**24**	**100**		
Position	Agricultural Officer	4	16.7							
	Agricultural Inspector	1	4.2			Range Officer	6	**25**		
	Field Assistant	17	70.8	2.75	0.944				2.13	0.797
	Budder	1	4.2			Block Officer	9	**37.5**		
	Field Worker	1	4.2			Forest Guard	9	**37.5**		
	Total	**24**	**100**			**Total**	**24**	**100**		
Experience	1-10	14	58.3			1-10	2	8.3		
	11-20	3	12.5			11-20	1	4.2		
	21-30	3	12.5	1.88	1.191	21-30	9	37.5	3.33	0.963
	31-40	4	16.7			Above 30 Years	12	50		
	Total	**24**	**100**			**Total**	**24**	**100**		

Source: Field data

The effective provision of extension services can help increase productivity and improve livelihoods in the farming community. Extension services are implicitly a connection among farmers, researchers and teaching institutions (Khan and Akram, 2012).

3.2.1 Education and Training

A majority of the respondents from agricultural extension services (58.3 % and 75.0 %, as indicated in Table 2) provide education and training to the farming community about crops and fruit trees, respectively. Additionally, 50 % never provide education and training about trees. On the other hand, 75.0 % and 66.7 % of respondents from forestry extension services offer education and training about trees and fruit trees, respectively, most of the time. Nearly 50 % have never provided education and training about crops in their target community.

3.2.2 Technology Transfer

The data in Table 2 show that more than 50 % of the respondents from agricultural extension services are involved in technology transfer for techniques used in the production, protection and post-harvesting of crops and fruit trees most of the time, while an average of 50 % of respondents mentioned never for trees. An average of 55 % of respondents from forestry extension services said they are involved with technology transfer to the farming community on the subject of trees and fruit trees most of the time. Approximately 60 % (on average) never engage in technology transfer activities for crops.

3.2.3 Marketing

Table 2 shows that a majority of the respondents from agricultural extension services, 60 % on average, help with marketing for crops and fruit trees most of the time. Meanwhile, more than 50 % of respondents admit that they never offer this service for trees. The data in Table 2 show a considerable majority of 55 % (on average) of respondents from forestry extension services offers helps in marketing processes for trees and fruit trees most of the time. Furthermore, nearly 80 % had never offered any advice related to marketing as an extension service for crops in their target community.

3.2.4 Financing

The data in Table 2 show that more than 65 % of the respondents from agricultural extension services were sometimes involved in helping to organize available financial resources for crops and fruit trees, while an overwhelming majority of 75 % of respondents never discussed this topic for trees in the farming community of their area. On average, 70 % of respondents from forestry extension services said they help with financial issues in the target community by providing residents easy and available solutions for trees and fruit trees only sometimes, and nearly 90 % never touch upon these issues for crops.

Table 2: Distribution of Respondents according to the Extension Services they Provide in Crops, Trees and Fruit Trees

Extension Services		Education & Training			Production Technology Transfer			Protection Technology Transfer			Post - Harvesting technology Transfer			Marketing			Financing			Infrastructure Development			Community Mobilization			Total
Area of Practice		Never	Sometimes	Most of the times	Never	Sometimes	Most of the times	Never	Sometimes	Most of the times	Never	Sometimes	Most of the times	Never	Sometimes	Most of the times	Never	Sometimes	Most of the times	Never	Sometimes	Most of the times	Never	Sometimes	Most of the times	For Each Extension Service
Agricultural Extension	Crops	0 (0)	10 (41.7)	14 (58.3)	0 (0)	11 (45.8)	13 (54.2)	0 (0)	12 (50)	12 (50)	0 (0)	8 (33.3)	16 (66.7)	0 (0)	7 (29.2)	17 (70.8)	1 (4.2)	17 (70.8)	6 (25)	1 (4.2)	10 (41.7)	13 (54.2)	0 (0)	10 (41.7)	14 (58.3)	24
	Trees	12 (50)	11 (45.8)	1 (4.2)	9 (37.5)	15 (62.5)	0 (0)	9 (37.5)	15 (62.5)	0 (0)	13 (54.2)	11 (45.8)	0 (0)	13 (54.2)	11 (45.8)	0 (0)	18 (75)	6 "(25)	0 (0)	15 (62.5)	9 (37.5)	0 (0)	12 (50)	11 (45.8)	1 (4.2)	24
	Fruit Trees	0 (0)	6 (25)	18 (75)	0 (0)	8 (33.3)	16 (66.7)	0 (0)	7 (29.2)	17 (70.8)	0 (0)	11 (45.8)	13 (54.2)	0 (0)	12 (50)	12 (50)	3 (12.5)	16 (66.7)	5 (20.8)	2 (8.3)	13 (54.2)	9 (37.5)	0 (0)	6 (25)	18 (75)	24
Forestry Extension	Crops	11 (45.8)	13 (54.2)	0 (0)	12 (50)	12 (50)	0 (0)	14 (58.3)	10 (41.7)	0 (0)	19 (79.2)	5 (20.8)	0 (0)	19 (79.2)	5 (20.8)	0 (0)	21 (87.5)	3 (12.5)	0 (0)	21 (87.5)	3 (12.5)	0 (0)	5 (20.8)	19 (79.2)	0 (0)	24
	Trees	0 (0)	6 (25)	18 (75)	0 (0)	9 (37.5)	15 (62.5)	0 (0)	9 (37.5)	15 (62.5)	0 (0)	9 (37.5)	15 (62.5)	0 (0)	9 (37.5)	15 (62.5)	0 (0)	15 (62.5)	9 (37.5)	0 (0)	14 (58.3)	10 (41.7)	0 (0)	7 (29.2)	17 (70.8)	24
	Fruit Trees	0 (0)	8 (33.3)	16 (66.7)	0 (0)	11 (45.8)	13 (54.2)	0 (0)	11 (45.8)	13 (54.2)	0 (0)	11 (45.8)	13 (54.2)	0 (0)	13 (54.2)	11 (45.8)	0 (0)	19 (79.2)	5 (20.8)	0 (0)	16 (66.7)	8 (33.3)	0 (0)	9 (37.5)	15 (62.5)	24

Source: Field data

Note: Figures in parenthesis show percentages

3.2.5 Infrastructure Development

The data in Table 2 reflect that nearly 50 % of the respondents from agricultural extension services took part in this activity sometimes as related to crops and fruit trees. A large majority of 62.5 % of respondents, meanwhile, never took part in this type of work for trees in their target community. Furthermore, 65 % of respondents from forestry extension services sometimes offered their services for infrastructure development related to trees and fruit trees. An overwhelming majority of 87.5 % of the respondents from forestry extension services never took part in infrastructure development related to crops in their target community.

3.2.6 Community Mobilization

The data in Table 2 demonstrate that a large majority (more than 65 %) of the respondents from agricultural extension services are involved in community mobilization in different ways for crops and fruit trees most of the time, while 50 % of respondents were never involved in community mobilization for trees in the farming community in their areas. On the other hand, more than 65 % of respondents from forestry extension services say they are associated with community mobilization related to trees and fruit trees most of the time. A small portion, approximately 20 %, never engaged in community mobilization as a core activity for crops.

3.3.1 Association between Extension Services and Areas of Practice for Agricultural Extension and Forestry Extension:

The results of Mann-Whitney's U test with respect to responses to the 3-point Likert scale for identifying the association between extension services and areas of practice is given in Table 3, and show that a similar type of association was found between crops and fruit trees by agricultural extension services and trees and fruit trees by forestry extension services in the provision of all extension services as z-values (-1.212, -0.876, -1.460, -0.876, -1.460, -0.747, -1.192, -1.212) and (-0.628, -0.579, -0.579, -0.579, -1.147, -1.257, -0.590, -0.606), respectively. The small values for difference in Mean Rank also support these results.

Table 3: Mann-Whitney's U test for Association between Extension Services and Areas of Practice for Agricultural Extension and Forestry Extension

Area of Practice		Education & Technology	Production Technology	Protection Technology	Post-harvest Techniques	Marketing	Financing	Infrastructure Development	Community Mobilization
Agricultural Extension	Crops - Fruit Trees								
	Mean Rank Difference	-4	-3	-5	3	5	2.46	4.3	-4
	Z	-1.212	-0.876	-1.46	-0.876	-1.46	-0.747	-1.192	-1.212
	Fruit Trees - Trees								
	Mean Rank Difference	20	19	19.62	18.96	18.5	16.25	16.38	20
	Z	-5.280***	-5.109***	-5.258***	-5.046***	-4.951***	-4.442***	-4.387***	-5.280***
	Crops - Trees								
	Mean Rank Difference	18	17.12	16.5	20.34	20.8	18.5	18.88	18
	Z	-4.774***	-4.694***	-4.564***	-5.359***	-5.474***	-5.036***	-4.974***	-4.774***
Forestry Extension	Trees – Fruit Trees								
	Mean Rank Difference	2	2	2	2	4	4	2	2
	Z	-0.628	-0.579	-0.579	-0.579	-1.147	-1.257	-0.59	-0.606
	Fruit Trees - Crops								
	Mean Rank Difference	19.66	18.5	19.42	21.7	21.3	21.62	22	16.88
	Z	-5.224***	-4.951***	-5.145***	-5.721***	-5.637***	-5.912***	-5.904***	-4.758***
	Trees - Crops								
	Mean Rank Difference	20.75	19.5	20.25	22.12	22.12	22.12	22.25	18.46
	Z	-5.493***	-5.171***	-5.332***	-5.826***	-5.826***	-5.913***	-5.926***	-5.120***

Notes: a. Grouping variable: Department of respondents
b. Mean Rank Difference = Mean Rank of Fruit Trees by AES – Mean Rank of Fruit Trees by FES (Same rule used for calculating the values of Mean Rank Difference for others)
c. Statistics significant at 1 % level of significance are indicated by ***

3.3.2 Association between Extension Services and Areas of Practice for Agricultural Extension and Forestry Extension:

The results of Mann-Whitney's U test with respect to the responses to the 3-point Likert scale for exploring

the association between extension services and areas of practice among agricultural extension workers and forestry extension workers is given in Table 4, and illustrate clearly that similar interest was found in fruit trees among agricultural extension and forestry extension workers in their delivery of the listed extension services as the z-value (-0.628, -0.876, -1.180, 0.000, -0.286, -0.757, -0.096 -0.924). The small values for difference in Mean Rank also support these results.

Table 4: Mann-Whitney's U test for Association between Extension Services and Area of Practice among Agricultural Extension and Forestry Extension

Area of Practice	Education & Training	Production Technology	Protection Technology	Post-harvest Techniques	Marketing	Financing	Infrastructure Development	Community Mobilization
Fruit Trees								
Mean Rank Difference	2	3	4	0	1	-2.38	-0.34	3
Z-value	-0.628	-0.876	-1.18	0	-0.286	-0.757	-0.096	-0.924
Crops								
Mean Rank Difference	18.58	18.5	19	22.34	22.54	20.75	21.62	16.08
Z-value	-4.977***	-4.951***	-5.059***	-5.886***	-5.951***	-5.636***	-5.755***	-4.583***
Trees								
Mean Rank Difference	-20	-18.38	-18.38	-19.88	-19.88	-20.25	-18.75	-19.5
Z-value	-5.280***	-4.966***	-4.966***	-5.249***	-5.249***	-5.412***	-5.030***	-5.146***

Notes: a. Grouping variable: Area of Extension Actvities
b. Mean Rank Difference = Mean Rank of Crops – Mean Rank ofFruit Trees (Same rule used for calculating the values of Mean Rank Difference for others)
c. Statistics significant at 1 % level of significance are indicated by ***

3.4 Extension Personnel Field Visits

The data in Table 5 describe the frequency of visits by extension personnel. For example, one agricultural extension worker and two forestry extension workers made visits two or three times per week. An overwhelming majority (21 and 20 of the respondents from agricultural extension services and forestry extension services, respectively) make one to four visits per month. Among these respondents, the proportion of lower-ranking field staff is higher than that of higher-ranking staff in both categories. Almost the same results were achieved by Luqman (2004): according to him, 94.5 % of the respondents made visits and contacts on a fortnightly basis. Visits less than once a month were reported by two respondents from each extension service in the study area.

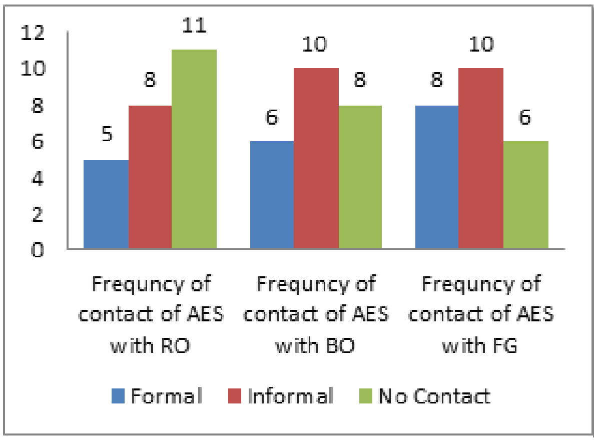
Table 5: Distribution of Respondents according to field visits

Position of Respondents		Frequency of visits to working territory			Total
		2-3 days/week	1-4 days/month	less than once a month	
Agricultural Extension	Agri. Officers	0	4	0	**4**
	Agri. Inspectors	0	1	0	**1**
	Field Assistants	1	15	1	**17**
	Budders	0	0	1	**1**
	Field Workers	0	1	0	**1**
	Total	**1**	**21**	**2**	**24**
Forestry Extension	Range Officers	1	5	0	**6**
	Block Officers	1	7	1	**9**
	Forest Guards	0	8	1	**9**
	Total	**2**	**20**	**2**	**24**
Total		**3**	**41**	**4**	**48**

Source: Field Data

3.5 Linkages between Agricultural Extension and Forestry Extension:

A close working relationship and institutional linkages among the different stakeholders in parallel field activities play a vital role in providing high-quality services to recipients in the area. Figure 1 describes the frequency of contact among extension personnel and the type of contact (formal and informal). Only five respondents from agricultural extension services have formal, eight have informal, and 11 have no type of contact with range officers from forestry extension services. Similarly, eight respondents from forestry extension have formal, three have informal, and a simple majority of 13 do not have any contact with agricultural officers from agricultural extension services in their working areas. Figure 1 also demonstrates that a considerable number of respondents (eight) from agricultural extension services have no contact, whereas 10 have informal, and only six have formal contact with block officers in forestry extension services in the area. In the same way, six respondents have no contact, 10 have informal, and eight have formal contact with an agricultural inspector in the area. Most interestingly, forest guards from the forestry extension services have the highest frequency of formal contact (eight respondents) with agricultural extension workers compared to others. Ten reported informal contacts with forest guards, with six respondents reporting no contact. On the other hand, field assistants from agricultural extension services have high frequencies of formal and informal contact with forestry extension personnel (eight and 12, respectively). There were only four who had no contact with field assistants in the area. The frequency of contact of forestry extension workers with budders and field workers from agricultural extension services was reported to be 4, 10, 10 and 1, 9, 14 for formal, informal and no contact, respectively.



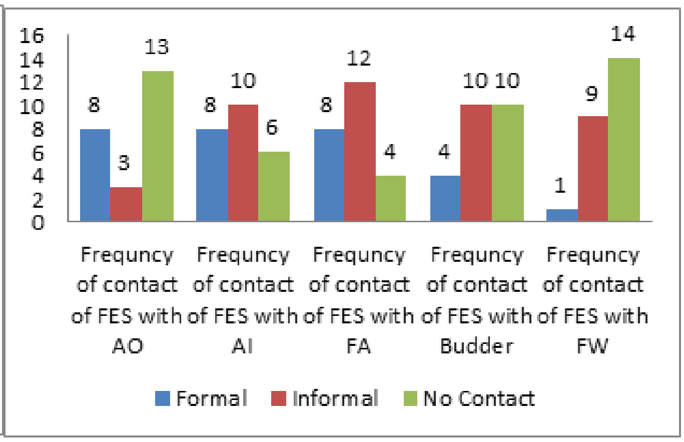


Figure 1: Frequency of contact with type of contact between extension personnel

4 Discussion

Pakistan, like many other developing countries, has inherited an enormous rural socio-economic sector that is blessed with rich natural resources (Mallah, 2005). In rural highland areas, agricultural extension and forestry extension are the main institutional components promoting the transfer and exchange of information. In many countries like Pakistan, weak linkages among the extension services of the agriculture and forestry departments is a major problem (Sharma, 2003; Mubangizi et al., 2004; Jan et al., 2008). Analyzing the demographic characteristics of the respondents reveals that a majority of the respondents from agricultural extension services were categorized as middle age, while on the other hand a majority of respondents from forestry extension services belonged to the old age category. During discussion, it was reported that this age difference results in an attitude of superiority among the respondents from agricultural extension services, who argue that they are more energetic and effective in delivering extension services, while older workers took less interest in work and more in talking. This argument is also supported by previous work (Basant, 1988; Tsur et al., 1990) that found that a person who is young or middle-aged will more quickly accept and respond to any action, mainly in terms of communication and understanding. From these results, it is evident that most of the respondents (agricultural inspectors and field assistants from agricultural extension, and range officers, block officers, and forest guards from forestry extension) had a low level of education (a diploma in agriculture and forestry). It has also been found (Glendinning et al., 2001) that a lower education level may also act as a dominant variable affecting communication and linkages. The study makes it clear that a majority of the respondents were lower in the agency hierarchy (field assistants from agricultural extension services and block officers or forest guards from forestry extension services). Moreover, during discussions with respondents, it was found that they have a very insignificant role in making decisions regarding field related activities. There is a famous proverb that

“Experience makes man more perfect”. The analysis of the data shows that there is a major difference in work experience in field related activities between personnel from agricultural extension and forestry extension services in the study area. Extension personnel from agricultural and forestry extension services consider their tasks to be mostly related to agricultural crops and trees, respectively. This argument is supported by two previous studies that found that agricultural extension has a strong reliance on the exchange of information among farmers regarding agricultural crops (Hedjazi et al., 2006) and that forestry extension is used to advocate for tree planting (Mead, 1995). In-depth analysis of the data shows that agricultural and forestry extension services have a common interest in fruit trees. Extension staff visits to a farmer’s field are important not only for the farmer’s education but also for diagnostic services. Follow-up of every activity is necessary to ensure processes run smoothly and feedback is provided. Similarly, the frequency of field visits by extension personnel is important. The analysis of the data shows that a majority of the respondents both from agricultural extension and forestry extension services visits their working territory a maximum of four times per month due to limited numbers of field staff and that they have been engaged in other official work. This negligible number of visits to the working territories by field staff has an incidental effect on extension-farmer contact, which ultimately affects the decision to participate in extension activities (Moulick et al., 1966) and is also responsible for a lack of linkages with stakeholders in the area. Extension personnel from agricultural extension and forestry extension services have no contacts in the field. Analysis of data from the Key Informant Interview session explored the idea that linkages are very weak due to the presence of inter-departmental biases in achieving the goals and objectives of public service extension providers, specifically in agriculture and forestry. Previous work (Shahbaz et al., 2007) reported that due to the lack of an effective extension system and weak departmental linkages the mountain farmers in NWFP use outdated techniques for crop production and tree planting. The data categorically establish that weak formal and informal contacts between agricultural and forestry extension agencies is the key factor hindering the effectiveness of their services and community mobilization.

5 Conclusions

It was concluded that a majority of respondents belong to the young and old age groups from agricultural extension and forestry extension services, respectively. A majority have an educational background consisting of a diploma in an agriculture or forestry-related subject. Fruit trees are the common area of practice where both agencies provide extension services (education & training, technology transfer for production, protection and post-harvest techniques, marketing, financing and community mobilization) among the farming community. Both departments are also carrying out the services listed above for fruit trees, in particular, but not for crops and other trees in general. Most of the field staff visits their respective working territory one to four times each month. Weak formal and informal contacts between agricultural and forestry extension services were also found.

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[AS2-1]

Cooperation of Private Forest Owners as a Factor for Sustainable Forest Management

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1 Summary

The forest policy of Lithuania is based on the sound and sustainable forestry management principles. Lithuania has signed Strasbourg Resolutions 1,2,3,5 and 6 (1990), all four Helsinki Resolutions (1993) and Lisbon Resolution (1998). Forest fragmentation by ownership forms as well as the lack of knowledge and experience of the new owners cause difficulties in implementation of the sustainable forest management principles. Therefore it is of pressing importance to evaluate changes of forest ownership structure, legal bases for sustainable forest management, development private forest owner's associations and cooperatives. In Lithuania the private forest ownership started developing in 1992 with the beginning of the restitution of forests to their former owners. The most important development conditions include the size of holdings, their distribution and forest owner characteristics. The Forest Law of 1994 introduced the basic principles of sustainable forest management and biodiversity conservation. Since Lithuania's accession to the EU, its forest policy has been influenced by EU directives, particularly regarding protected areas. The new strategic document "The National Forestry Development Programme 2012-2020" were approved in 2012. One of the strategic objectives of this policy is to create the legal and economic conditions for promoting the merging of small forest holdings through cooperation among forest owners. The paper outlines the development private forest ownership, private forest owners' association and cooperation processes in Lithuania.

2 Forest ownership structure

In Lithuanian the private forest ownership dominated till Land Reform, which has been implemented in 1920. Private forest owners owned about 65% of total forest area. 600.2 thousand hectares private forests have been transferred to the state forests during 1919-1937. Since 1938 private forests constituted only 173 thousand hectares (about 16% of total forest land area). In 1940 private forests have been nationalised by Soviet Governance. Since 1950 the private forest ownership has been avoided in Lithuania (Fig. 1).

After the restoration of independence forest property rights have been restored. The structure of forest ownership has changed due to an ongoing Land Reform process. Around the half (49.5%) of all forest land in Lithuania is State Importance. 42 State forest enterprises and 1 national park, under subordination of the

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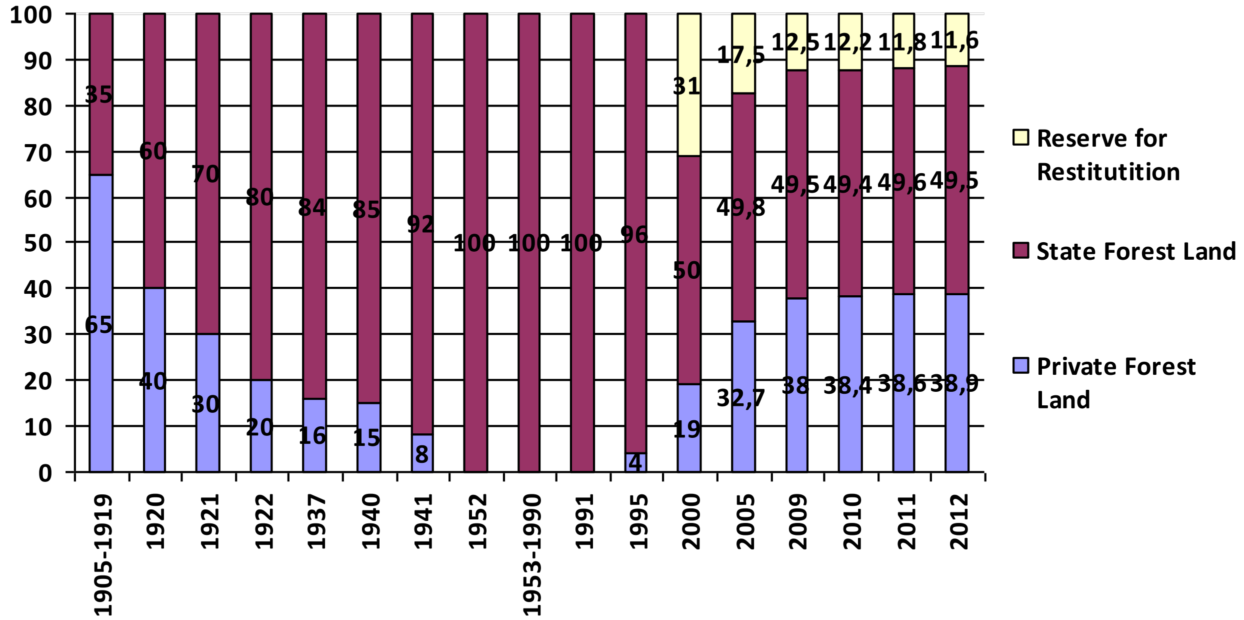

Figure 1: Forest land ownership in Lithuania for period 1905-2012.

Source: Lithuanian Statistical Yearbook of Forestry, 2000, 2005, 2009, 2010, 2011, 2012.

Ministry of Environment, manage 1,076,500 ha of forest land (01-01-2012). State Forest Enterprises are divided into 354 forest districts, which average size is 3000 ha (Lithuanian Statistical Yearbook of Forestry, 2012).

Today the private forest sector constitutes 248.0 thousand private forest owners and 844.5 thousand hectares of private forests (01-01-2012). This is 38.9% of total forest area. The average size of private forest estate is 3.3 ha (01-01-2012). According to the sociological survey of private forests owners results of the year 2004 about 55% of private forest owners live in rural areas. The majority (over 82%) of private forest owners reside in the county where their forests holdings are located. 30.7% of forest owners are more than 70 years old (Mizaraite, D. and Mizaras, S., 2005). The process of private forest owner's transformation is observed in Lithuania. The survey results obtained in the year 2013 showed that forest owners older than 65 years constituted only 7.2 percent (UAB "Eurosprendimai", 2013).

With the restoration of independence, on 11th March 1990, process of drastic political, social and economic transformation began, which has profoundly affected the forestry sector. All forest land was first transferred to the country-wide network of 43 state forest enterprises under the Ministry of Forestry. Restitution model with the compensation elements was selected. Two acts constitute the legal basis for land restitution and privatization: the Law on Land Reform, adopted on 25 July 1991, and the Law on the Procedure and Conditions of the Restoration of the Rights of Ownership to the Existing Real Property, adopted 18 July 1991. In 1991, the policy was to restrict the size of private forest estates to a maximum of 10 ha per individual owner. Private forest property was to be granted only in production forest areas, meaning that all protected forest areas would have remained under state management. This solution would have left, overall, about 95% of forests in Lithuania under the management of the State Forest Administration. In the period of a year the maximum size of forest estates per individual owner was raised from a maximum of 10 to a maximum of 25 ha. In the southeast of the country, there were, however, no limits provided as to size of individual private forest estates. The government is considering the possibility of raising the private forest estate size maximum of 50 ha per individual. Confusion in the restitution process is created by changing maximum size limits of individual private forest estates and through regulations enabling individuals, entitled to receive agricultural land through the restitution process, to claim forest land instead. Furthermore, individuals, with the right to claim forest land, are able to choose monetary compensation instead. Since 1 May 2005, companies are allowed to bay and own forest land. The restitution process is not yet completed in Lithuania. Major forest restitution process problems:

- a slow-proceeding Land reform and has not yet been completed;
- the complex bureaucratic procedures for the restitution of the forest land;
- the restriction for forest area restitution - first till 10 hectares, then till 25 hectares, then till 150 hectares;
- forest estates were not restituted in strict forest protected areas and other national significance forest areas.

Emerging the private forests ownership and free timber market caused changes in forestry sector. The first stage of privatization was being implemented in 1991-1995. Citizens were given investment vouchers worth LTL 10.5 billion (USD 2.63 billion) in nominal value, which let them participate in assets selling. By October 1995, they were used as follows: 65% for acquisition of shares, 19% for residential dwellings, 5% for agricultural properties, while 7% remained unused. More than 5700 enterprises with LTL 7 billion (USD 1.75 billion) worth state capital in book value were sold using four initial privatization methods: share offerings, auctions, best business plans competitions and hard currency sales. The second privatization step began in 1995 by approving a new law that ensured greater diversity of privatization methods and enabled the participation in the selling process without vouchers. During the period of 1996-1998, 526 entities were sold for more than LTL 2.3 billion (USD 0.58 billion). Before the reforms, the public sector totally dominated the economy, whereas the current share of the private sector in GDP increased to over 80%. Forest privatization process in Lithuania has been very limited. In 1995 foresters professionals had a possibility to bay up to 5 hectares of forest land. For forest land purchase vouchers were used. Totally privatized forest land area were about 8 thousand ha.

3 Legal bases for sustainable forest management in private forests

Until the restoration of independence in the Lithuania (former Lithuania SSR) forest policy has been shaped according to the Soviet Union's forest law. All forests were state property or managed by the kolkhozes. Forestry was managed according to a centralized plan, which has been approved by the state institutions. The determination of timber prices has been centralized.

In 1994 was adopted Forest Law by the Independent Republic of Lithuania, which defined the basic forest policy statements. The Forest Law was issued on 22 November 1994. It was updated in 1996 and 1999. In 2001 the new Forest law was approved by Parliament (Seimas). In new Forest Law basic principles of sustainable forest management and biodiversity conservation were introduced in a broader sense. The

Forest Law establishes rights and duties of all forest managers, owners and users of the Republic of Lithuania to: utilize, reproduce, grow and protect forests, strikes a balance between the interests of forest owners and society, establishes the main principles of forest management. Basic characteristics of the Forest Law of the Republic of Lithuania (1994): 1) forest ownership forms diversity (forests may belong to the state, natural and legal persons); 2) the state forest (forest area) property must prevail in Lithuania; 3) ownership rights of the national importance forests (high social and ecological significance of forests) exclusively belongs to the Lithuania Republic (it is state property); 4) state forestry policy directions are determined by the Parliament (Seimas) thought the Forest law; 5) state forestry strategy formation and forestry programmes preparation functions are delegated to the Ministry of Environment; 6) the order of forest cutting permits issuing for state managers and private forest owners is determined by the Ministry of Environment; 7) citizens shall enjoy the right to visit forests freely, except for reserved forests and forests of a special purpose (borderland, military facilities etc.) designation. They may gather medicinal herbs, fruits, nuts, berries and mushrooms, keep bees in hives apiaries observing the Forest Law and the Law on Environmental Protection of the Republic of Lithuania as well as subordinate legislation.

After the Lithuania accessed EU the Lithuanian forest policy is influenced by the EU directives, particularly issues of protected areas.

The Lithuanian Forest Policy and its Implementation Strategy was approved in 2002. This document covered the forest policy formulation principles, guidelines of the forest policy, SWOT analysis and the vision of the forest sector, the mission of the state and strategic forest development objectives. Several important strategic forest development objectives could be mentioned, for instance: involvement of the society in the decision-making process of the major forest issues, rational, sustainable and continuous use of the forest resources and increase of the forest productivity, ensuring the stability of forest ecosystems, preservation of the biodiversity and improvement of forest healthiness, meeting the general forest-related society needs, increase of forest coverage and etc. (Lithuanian Forestry and its Implementation Strategy, 2003). Also the Action Plan has been designed for the implementation of the strategic forest development objectives, which include definite actions and means for the development of separate strategic objectives setting up the period for the implementation of these means and defining responsible institutions. Several important measures and mean related to social and cultural aspects of forests, which have been designed in the Action Plan mentioned: the organisation and analyses of public surveys on forest issues, organization of discussions on forest issues with private forest owners, forest specialists and the public, organization of the working groups of forest specialists, representatives of all interested parties and stakeholders for dealing with the most important problems in forest sector, organization and implementation of unified forest information system, setting up the priorities of forest research activities and etc. The new Action Plan was approved in 2007. New forestry policy strategic document “The National Forestry development programme 2012-2020” was approved by the Government of Republic of Lithuania at 23 May, 2012. The document covered forest sector development objectives, tasks, valuation criteria and their importance, programme implementation procedure. The new Action Plan for this programme implementation is should be prepared during the year 2013.

Table 1: Main legal acts ensure sustainable forest management in private forests

Rule/regulation	**Provisions**
Property rights:	
Law on Land	This Law shall establish the relations of ownership, management and use of land in the Republic of Lithuania. This Law is obligatory for all land owners, managers and users.
Law on Land Reform	This Law shall regulate the order of Land Reform and procedure of land privatization.
Law on the Restoration of the Rights of Ownership to the Existing Real Property	This Law shall regulate the procedure and conditions of the restoration as well as the recognition of continuity of the restoration of the rights of ownership to the citizens of the Republic of Lithuania to the real property.
Forest management:	
Forestry Law	The purpose of the Forest Law is to regulate reforestation, protection and usage and to form the legal preconditions for the management of all ownership type forests. The Law is obligatory for all forest owners, managers and users.
Law on Protected Areas	The Law shall regulate social relations related to system and management protected areas. The Law is obligatory for all forest owners, managers and users. Regulations on Management and Use of Private Forests. The regulation is obligatory for all forest owners, managers and users.
Special Conditions of Land and Forest Use	The regulation is obligatory for all forest owners, managers and users.
Regulation on Forest Use and Protection in Nature Protected Areas	The regulation is obligatory for all forest owners, managers and users.
Regulation of Sanitary Forest Protection	The regulation is obligatory for forest managers, owners, users and visitors.
Rules of the Fire Prevention Service	The rules are obligatory for all forest owners, managers, users and contractors dealing with forest harvesting.
Regulations of Reforestation	The regulation is obligatory for forest managers and advisable for forest owners.
Rules of Thinning and Sanitary Felling	The rules are obligatory for state forest managers and users.
Regulations for Final Forest Felling	The regulations are obligatory for all forest owners, managers and users.
Non-wood activities on forests:	
Hunting Regulations	The regulation is obligatory for hunting area owners, users and managers.
Rules of Visitation of Forests	The regulation is obligatory for forest owners, users, managers and forest visitors.
Rules of picking-up of Mushrooms in the Forests	The regulation is obligatory for users of non-wood products.

4 Development of private forest owners associations and cooperatives in Lithuania

All forests, irrespective of their size and purpose, must be well managed and cared for. The owners of large forest holdings can afford to hire forest managers or rangers to manage and protect their forest property, but small and medium-sized forest owners cannot (Hägglund, 2008). One way of solving this problem is to create cooperation. Forest owners who are members of a cooperative can still decide how to manage their forest property and to what extent they want to use the cooperative's services.

Today two NGO's organizations are representing interest of private forest owners in Lithuania:

- Forest Owners Association of Lithuania (FOAL);
- Private Forest Owners Association (PFOA).

4.1 Forest Owners Association of Lithuania (FOAL)

In April 1993, the Forest Owners Association of Lithuania (FOAL) was founded with the initiative to represent the interest of forest owners and to develop the institutional framework for the family forestry. The objectives of FOAL are to: 1) assist former private forest owners in the restitution of their property rights; 2) influence the formulation of legislation to the advantage of private forest owners; 3) provide professional advice to the members of the Association; 4) organize the formation of cooperation between owners of small private forest estates in order to facilitate management and utilization of forest resources; 5) collaborate with other farmers' and land owners' organizations; 6) and collaborate with associations of forest owners from other countries.

The role of FOAL is a very strong at the national and international levels as representing organisation of private forest owners' interests. In FOAL two types of members exist: members - private forest owners (physical persons) and members as forest owners cooperatives and forest companies (legal persons), which providing the services for private forest owners (Weiss, G. et. al., 2012b). More than 6500 private forest owners are the members of FOAL and 16 forest owners' cooperatives (FOCs) and forest companies. Today Forest Owners Association of Lithuania has 29 Regional units, 9 Regional Associations and 34 members - forest owner's cooperatives (6) and forest companies (28), which providing services for private forest owners (Fig. 2).

Private forest owners can participate directly in FOAL's activities, but FOAL is not allowed to provide commercial services. It therefore created a network of FOC's and other enterprises to provide forestry-related services. Forest owners can participate in the network in different ways:

- as full members of a cooperative;
- by signing a long-term forest management agreement;
- to sell standing timber (or a whole forest) through the network;
- to obtain free consultation and training related to forest management;
- to purchase forest services, etc.

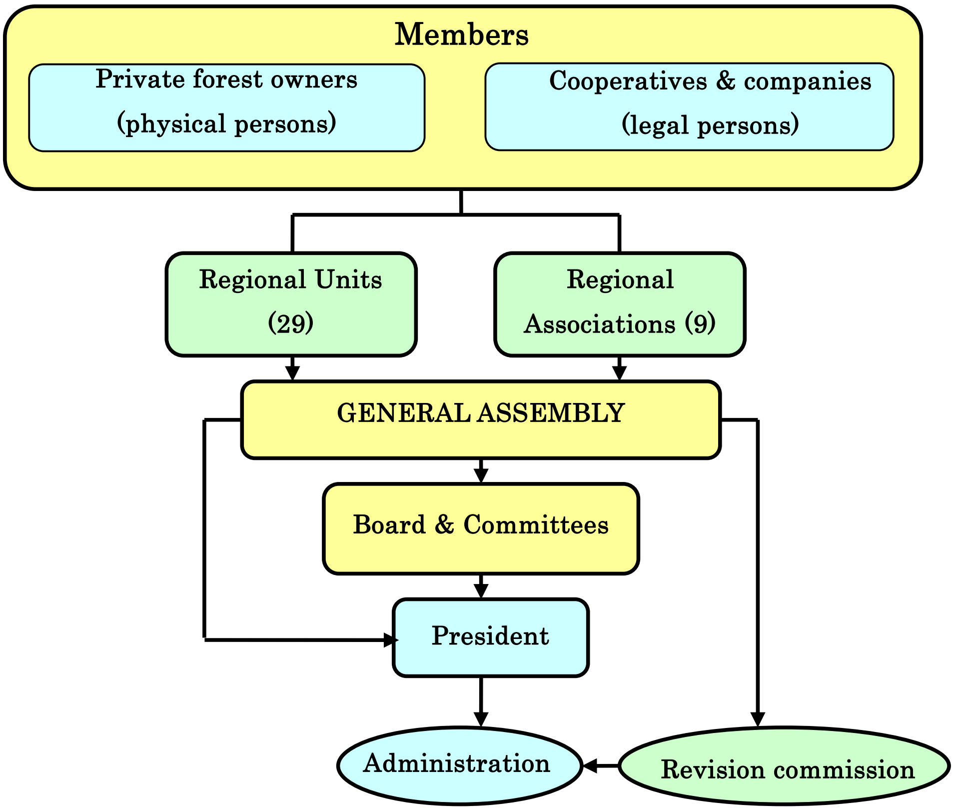

Figure 2: The organizational structure of FOAL.

4.2 Private Forest Owners Association (PFOA)

PFOA was established in 2005. Establishment of this Association has been initiated by the official from the Ministry of Environment. This organization represents the interests of forest companies, which providing forest relating services (logging, bio-fuel production etc.).

4.3 Cooperation of private forest owner's

The Forest Owners' Association of Lithuania initiated establishment of the first FOC's for private forest owners in Lithuania. According to the Law on Cooperatives of the Republic of Lithuania: "A cooperative society (cooperative) is an economic entity established on the basis of law on a voluntary basis by a group of natural and (or) legal persons for the purpose of satisfying business, economic and social needs of its members and functioning on their initiative and at their risk" (Law on Cooperatives Republic of Lithuania, 1993). Cooperatives should have five or more members. The first cooperative for private forest owners was founded in 1998, and several others were created soon after. The main reason for their establishment was to address rapid increases in the industrial demand for roundwood and in forest owners' demand for forestry services.

The restitution of private forests to their former owners resulted in the emergence of problems that require special effort, skills and resources (Lazdinis, Pivoriūnas and Lazdinis, 2005). The creation of a network of local cooperatives and other enterprises provides private forest owners with a source of the services they need. There are now 12 private forest owners' cooperatives officially registered on Lithuania's Register of Legal Entities and operating in different districts of Lithuania, helping their members to solve forest management problems. Over the last decade, cooperation among private forest owners has increased. FOAL has developed a network of FOCs and other enterprises that provide forestry-related services, including trade in roundwood. From 2001 to 2008, FOAL ran the *Infomedis* ("info tree") market information system, a monthly bulletin supplying up-to-date market information on roundwood sales and prices in private forests, distributed via email. Today FOAL has six member FOCs for private forest owners – Aukštaitijos šilas, Miško žemė, Privati girininkija, Raseinių šilas, Saulės šilas and Tauragės šilas.

4.4 Forest owner's cooperative Aukštaitijos šilas

FOC was established in 1998 and is located in Molėtai District, Utena County. Aukštaitijos šilas has five members (physical persons), owning a total of 700 ha of forest land. The number of members has not changed since it was first established. All commercial decisions are made by the Executive Director, who is a member of the FOC, but the Board has the right to cancel or change these decisions, if necessary. At the beginning, the FOC provided two services for private forest owners: preparation of individual forest management plans, and advisory services. Today the cooperative provides a broad range of services for private forest owners, such as timber trade, long-term management of forest property, consultation and training related to forest management, agricultural land afforestation, improvement of recreational areas, and organization of commercial hunting. Six highly skilled professional foresters provide forest-related services for the FOC's members. Aukštaitijos šilas has approximately 21 263 ha of private forests in Molėtai District owned by 9 981 individuals whose average holding is 2.13 ha. The presence of large numbers of private forest owners in the district provides excellent opportunities for the cooperative to develop its activities.

The main objectives of FOC Aukštaitijos šilas are to: 1) benefit its members through sustainable forest management activities; 2) increase management efficiency on private forest holdings; 3) defend private forest owners' economic interests; and 4) represent forest owners in dealings with business partners. Over the years, the FOC has developed its infrastructure and provision of services. The main services provided are: information, consultancies, teaching and education (free of charge); timber trade; forest management plans; afforestation; forest cutting; improvement of recreational areas; marketing of forest production and evaluation of timber volume; sawn timber production; organization of hunting; agro-tourism, etc.

By joining the cooperative, forest owners obtain access to professional help in managing their forests. Specialists working at the cooperative are well acquainted with the problems that forest owners' face and can suggest the best solutions to these problems. Private forest owners who are not members can sign contracts with FOC Aukštaitijos šilas for a year or more, to obtain forest management services.

FOC Aukštaitijos šilas is a member of FOAL, through which it can influence and take part in forest policy formulation. The FOC's Executive Director is a member of the FOAL Board. Cooperative membership of FOAL enables the FOC to submit proposals to governing institutions responsible for the private forest sector.

Several factors in the FOC's success can be identified:

- free advice for and consultation of private forest owners, which creates trust;
- a broad range of forest-related services with flexible service provision, which enables private forest owners to participate in the cooperation network in different ways;
- the authority of the professionals it employs to help private forest owners solve their forest management problems;
- training and special educational courses for private forest owners;
- the presence of a large number of owners, which creates a market for the FOC's forest services.

Conclusions

Cooperation in private forestry is in its early stages in Lithuania, but progress can already be observed. One of the strongest factors in this progress is FOAL's creation of a network of cooperatives and other enterprises. In the future, higher production costs and strong competition in the markets for wood products will encourage private forest owners to join and establish more FOCs with large numbers of members and a strong position on wood products markets. This case study shows that private forest owners in Lithuania can participate in cooperatives in various ways, from being full members to signing agreements to obtain access to a service for a specific period (Weiss, G. et. al., 2012a).

The experience of FOC Aukštaitijos šilas demonstrates that establishing cooperation among private forest owners is a long process. Although it was established in 1998, the FOC still has only five members, which highlights two potential problems for private forest owners' cooperatives in Lithuania: 1) Cooperative managers and members are not interested in increasing the number of members; 2) Private forest owners are not interested in becoming cooperative members. However, the cooperative has developed an excellent system for providing services to private forest owners.

Acknowledgements

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[AS2-2]

Investigating the relation between economic fluctuations and employment intention

A survey on Japanese forest owner's cooperatives

Uichi Hayashi[1], Shin Nagata[2] and Thomas Jones[3]

1 Introduction

Economic fluctuations affect employment. Theoretically, employment should adjust simultaneously with the fluctuation, but due to the cost of adjustment or the friction of hiring and turning over, or the cost from the loss and the rebuilding of human capital (especially firm-specific human capital), enterprises may continue to employ or, in some cases, hesitate to hire workers. Therefore, the employment adjustment will be less flexible than the fluctuation itself (e.g. Wakita, 2003).

In Japanese forestry, the labor is derived from the general labor market more than previously. Furthermore, many forest owners' cooperatives employ the labors as working group members, and its scale is large. According to the National Census in 2005, almost half of the forestry employees are hired by the forest owners' cooperatives. Thus, we conducted a questionnaire on Japanese forest owners' cooperatives in 2012, and asked the managers about both their comprehension of business conditions and their employment intentions from 2008 to 2011.

668 questionnaires were distributed and 420 responses received. Among them, we excluded the respondents who wrote zero or N.A. in all the space where number of employees should be written. Finally, 390 respondents were valid.

2 Methods and Results

The questionnaire asked about the awareness of the industry situation and the employment methods each year from 2008 to 2011. The data is analyzed with the Diffusion Index (DI). The Diffusion index is normally used for the analysis of the economic fluctuation forecast, and indicates the difference of the number between the better and worse answered. It is calculated to divide the difference by the total number and showed as a percentage.

In the industry condition DIs, it was -18.9% points in 2008, and, -18.0% points in 2009, 0.9% points

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increase. Again it decreased to -22.3% points in 2010, and in 2011, -43.8% points. Although the industry condition seemed to improve from 2008 to 2009, it worsened after 2009 especially from 2010 to 2011. It may be affected by the start of the new forest policy on that year; the forest and forestry rebuilding plan.

Table 1: Industry condition DI

	2008	2009	2010	2011
upturn	52	52	50	78
normal	204	211	198	158
downturn	124	121	136	197
DI (% points)	-18.9	-18.0	-22.3	-43.8

According to the employment DI, the regular employee DI was -13.2% points in 2008, increasing to -12.4% points in 2009, then decreasing into -13.2% points in 2010 and -14.9% points in 2011. Comparing the differences from 2009 to 2011, the difference between 2010 and 2011, -1.7% points, was larger than between 2009 and 2010, -0.8% points. The regular employee DI improves from 2008 to 2009, but decreased from 2009 to 2010, and more decreased from 2010 to 2011. This trend was similar to that of the industry condition DI. Because the business condition in forestry improved, the employment condition was improved, and temporarily the labor shortage would be improved. However, after 2009 both the industry condition and the employment condition worsened, so the labor shortage would be more serious.

Table 2: Regular employment intention DI

	2008	2009	2010	2011
overabundant	15	14	17	26
adequate	286	296	288	263
shortage	63	60	66	81
DI (% points)	-13.2	-12.4	-13.2	-14.9

Next, the seasonal employment DIs, from 2008 to 2011, decreased consistently. Seeing the trend of the differences, the difference between 2009 and 2010 was the largest, between 2008 and 2009 was the second largest, and between 2010 and 2011 was the smallest.

Table 3: Seasonal employment intention DI

	2008	2009	2010	2011
overabundant	18	15	20	20
adequate	228	238	220	213
shortage	34	37	52	56
DI (% points)	-5.7	-7.6	-11.0	-12.5

Differences could be seen when comparing the trends of the regular employees with the seasonal ones.

The regular employee DI improved from 2008 to 2009 much like the industry condition DI, but the seasonal employee DI consistently decreased, and the difference between 2010 and 2011 of the decrease was the smallest even though the industry condition DI showed the largest decrease in that term.

Overall, both of the business conditions, seasonal employee, and regular employee DIs were negative throughout the whole survey term. Their big and small relation also did not change during that term. Given that the employee DI was negative consistently, although they understood the industry condition was bad, they also understood the labor amount was shortage rather than overabundant. Furthermore, regular employee DI was fully higher than that of seasonal employee. The regular employee shortage was more recognized than that of seasonal employees.

Here, we will see the adjustment action of the employment and the labor hoarding action in the forestry labor market. First, let's see how the forest owners' cooperatives adjust the employment when they dismiss the employee. We asked how they moved to avoid the dismissal including the attitudes towards the dismissal itself. Then, 78.7% of the respondents wanted to avoid the dismissal, and the means of adjustment when somebody needs to be dismissed was the adjustment of working days was -49.7% points, that of wage was -63.9% points, the change from regular to seasonal employment was -69.6% points, and the social service cut off was -75.8% points. In other words, most forest owners' cooperatives wanted to avoid dismissing staff and, in cases when they were considering a dismissal, they would adjust the working days first.

Table 4: Employment adjustment DI

	try to avoid the dismissal	adjust by the working days	adjust by the wage	change the regular to seasonal employment	cut the social security or insurance
yes	307	49	23	22	14
cannot say clearly	65	82	84	64	59
no	8	227	253	273	287
DI (% points)	78.7	-49.7	-63.9	-69.6	-75.8

Is there any person they are willing to keep even in the downturn? We asked whether there was a person they wanted to keep in the downturn and chose maximum three characteristics of such a person if there were. Results showed that 90% of them answer there was a person they wanted to keep even in the downturn, and the characteristics of a person more than 50% respondents chose were that he works hard, can communicate well, is young, or has more certificates. If he is superior in these cases, the forest owners' cooperatives were more willing to continue his employment. On the other hand, having many dependent family members or born in the neighborhood didn't encourage them to continue his employment. Basically, the forest owners' cooperatives were more eager to retain workers whose current productivity or future productivity were or would be high.

Table 7: Characteristics of a person who is willing to be kept in the downturn
(N=366, maximum 3 choices)

works hard	78.7%	healthy spirits	18.6%
communicate well	62.8%	born in the neighborhood	16.9%
Young	50.8%	the other reasons	7.7%
have a lot of certificates	50.3%	have many dependent family members	3.6%

1) The number is the choice ratio expressed in the percent.

3 Discussion

Generally, hiring seasonal employees reduces the cost more than the regular employee, thus the demand for seasonal employees will increase under the understanding of a downturn. However, from 2010 to 2011, though the industry condition DI decreased in the largest, the diminution of the regular employee DI was most similar to that in the other terms, while seasonal employee DI became comparatively smaller. One reason why the survey results were like this would be the seasonal employee is seen more as the adjustment valve, and they were seen as more overabundant in the serious downturn. Then the recognition that the regular employee was short would continue and the recognition that the seasonal employee was overabundant would increase.

Furthermore, in the case of the seasonal employee, the DI continuously decreased even from 2008 to 2009 when the industry condition improves. So there might be other causes than the business condition for the seasonal labor supply. One would be the decrease of the farm-forest owners. Because of the long term downturn in primary industries, the farm-forest owners as the main source of seasonal labor supply decreased. Therefore, the sufficient labor supply in the seasonal employment cannot be expected and its DI remained higher than the regular employment DI.

On the other hand, although the regular employment entailed higher costs because of the social security system, a person who is regularly employed could be more educated and be expected to raise his productivity. Moreover, if the employer seek candidates from ordinary job seekers, getting the additional labor is easier. Thus, the shortage awareness might be displayed more clearly in the regular employment intention.

Most respondents thought they were not facing the kind of serious situations which would require a dismissal, or they would not adopt the other strategies like adjusting more working days, wage, shifting to the seasonal employee, or cutting the social security when facing that kind of situation. On the other hand, in the case of the employment adjustment required, adjusting the working days were more inclined to be preferred than the other strategies above.

In Japan, employee dismissal is heavily restricted by law, thus the enterprises basically cannot lay people off. Therefore, the employment adjustment caused from the economic fluctuation is mainly received by the working day adjustment. We may say a similar tendency is seen in forestry from our survey.

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[AS2-3]

Private Forest Owners' Willingness to Participate in Cooperative Management in Taiwan

Kai-An Lo[1]

1 Introduction

Non-industrial private forest (NIPF) or family private forest is owned by any nonindustrial private individual, group, association, corporation, aboriginal tribe, or other private legal entity that does not also own a wood processing facility, but has definitive decision making authority over the rural land. NIPF are unlike public or industrial forests. Most of these forests are small, family owned and diversified objectives of owners. In many countries, NIPF play an important role in regional economy, which fully reflects the efficiency and flexibility of the private sectors, such as Canada, Finland, Germany, Japan, Sweden, and so on.

Based on the Third Inventory on Forest Resources and Land Utilization in Taiwan which was completed in 1995, the forest area throughout the island was about 2.1 million ha., accounting for 58.5% of total area of the island, and the area of state-owned forests was about 1.6 million ha., accounting for 76.7% of total forest area (Taiwan Forest Service, 2007). Since 1990, natural forests logging prohibition has been implemented throughout Taiwan and annual allowable cutting were set below 200,000 m^3. Today, the number of logged timber in Taiwan just reached 50,000 m^3/yr which is less than 1% of total timber consumption in Taiwan, i.e. the rest of 99% relies on foreign import.

Although most of forests are state-owned in Taiwan, private forests in Taiwan including forests owned by individuals, reserved forestland for Taiwanese aborigines, state-owned leased forestland, and afforestation on farmland. Totally, Taiwan private forests cover over 450,000 ha. (21.4% of total forest area), and cannot be ignore their potential of timber production because of convenient location and transportation. As this result, many private forests have participated in the government's reforestation reward program (All-people Reforestation on Slopeland or Afforestation on Farmland Program) began in 1990.

In order to pursue the balance of environmental conservation and self-sufficiency of timber production, forestry management usually requires big scale in order to realize economic benefit and complete environmental quality requirement (Lo, 2011). Cooperation can be summarized several categories potential benefits: joint purchases, joint sales, joint forest management and planning, joint forest protection and enhancement of non-timber forest products, and socio-economic benefits (Kittredge, 2005). Forest cooperatives are generally created to assist forest owners in obtaining the best value for goods and services. They help forest owners participate in activities such as afforestation, tending and protection; produce and distribute superior planting stocks; provide members with up-to-date technical information and training;

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and collect, grade, process, pack and distribute forest products. They contribute to local skills and business development, mentoring and employment, and can also promote democracy and good governance (ICA, 2003). Cooperation could act as a mediating element between private and public parties, motivating and helping owners to take further measures that improve their economic situation and apply for public support (Hansen, 2013).

Cooperation organizations of forestry industry (such as cooperatives and forestry companies) were set up early as 1948 in Taiwan (Lo, 1980, 1988). As Taiwan forest production decline began in 1980s, only few cooperative organizations still exist now. Based on the experience of developed countries (such as Japanese Forest Cooperatives and Forest Owner Management Association of Finland), and even Collective Forest Tenure Reform of China (Yang *et al.*, 2013), etc. Forest owner cooperation has the potential to provide profitability and many public benefits. Therefore cooperation has often been promoted as a tool to implement public policy on private lands (Kittredge, 2005).

Researches have suggested that several motivation theories can explain why individual wants to cooperate with the others: resource dependence theory, transaction cost economics, economies of scale, organizational learning theory and product value chain. However, no studies have applied those theories on cooperation of private forests owners in Taiwan. In our pilot research, resource dependence theory (RDT) seems a plausible explanation. The purpose of this empirical research was an attempt to validate RDT whether it can explain the influencing factors of cooperation on private forests in Taiwan. The results should be useful for the government in promoting private forests cooperatives.

2 Methods and data

2.1 Research framework

Few studies have report on forestry cooperative organization related to other industries such as agriculture, fisheries, animal husbandry in Taiwan. Atmiş *et al.* (2009) have analyzed forest cooperative's participation in forestry in Turkey. By using a principal component analysis it was found that the most important factors affecting forest cooperative's participation in forestry are: (1) member involvement, (2) forest ownership and administration, and (3) harmony within cooperatives and between cooperatives and the state. These three factors explained 59% of participation within a cooperative. Hull and Ashton (2008) found the keys to successful cooperatives include maximizing forest owner control and flexibility, emphasizing amenity and environmental qualities over short-term profits, cautiously integrating harvesting processing and marketing functions, accessing capital from public grants and private investors, and having good management skills and a sophisticated resource inventory system. Yang *et al.,* (2013) have surveyed Southern China as pilot projects for the implementation of collective forest tenure reforms in 2004. They found that nonindustrial family forest landowners' stated willingness-to-participate in forest cooperatives was associated with demographic characteristics like education, forest-related income, size of forestland, and attitudes toward land tenure reform and cooperatives.

In past motivation theories, which is better known as the RDT, it purposed by Pfeffer and Salancik (1978). RDT suggested that no one individual or organization can be completely self-sufficient in limited resources, lack of resources in a business, you need to rely on outside supply of resources, it will inevitably create a join relationship with the outside world. Therefore, cooperation is advantageous means to obtain resources. A cooperative strategy can create dependency through resource exchange, production factors, capital, technology and equipment, and information exchange; reduce environmental uncertainty; form the operation of an organization or enterprise (Duan, 1996).

Based on the RDT and previous research, this study proposed the following research framework and four hypotheses:

H_1: "Forest owner management capacity (X_1)" has significant negative impact to ” Owner’s willingness to participate in cooperative (Y)".

H_2: "Objectives of forest management (X_2)" has significant impact to " Owner’s willingness to participate in cooperative (Y)".

H_3: "Conditions of forestland (X_3)" has significant negative impact to " Owner’s willingness to participate in cooperative (Y)".

H_4: "Supportive resources (X_4)" has significant positive impact to " Owner’s willingness to participate in cooperative (Y)".

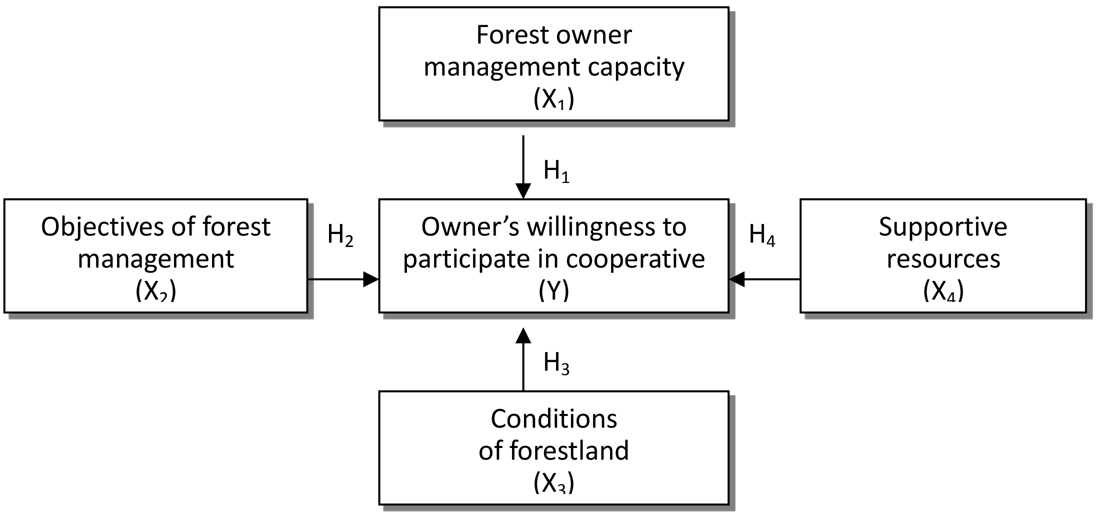

Figure 1: Research framework and Hypotheses

In this empirical study, researcher designed the questionnaire and surveyed forest owners to collect data. The questionnaire designation was based on research framework. The main variables of the analysis were shown in Table 1. Consider one forest owner may hold not only one parcel land. The dependent variable of this study was the owner’s willingness to participate in cooperative of his/her land (Y), which is a dichotomous variable, thus researcher estimated it by logistic regression method. Most of the explanatory variables were expected to be positive effect, but forest management knowledge and skills of forest owners (X_{12}), as well as more emphasis forest management objectives on recreational (X_{22}) who will do not rely on cooperation than expected to support by the cooperation organization, so they will expect to a negative effect on participate in a forestry cooperative.

Table 1: Description of dependent variable and explanatory variables used in the logistic regression model

Factor	Variable name	Measurement description	Sign of expectation
Dependent variable	Owner's willingness to participate in cooperative of his/her land (Y)	Dichotomous (willing：1；unwilling：0)	
Forest owner management capacity (X_1)	Young forest owner (X_{11})	Dummy (less or equal 60 years old：1；otherwise：0)	＋
	Knowledge and skills of forest management (X_{12})	Nominal (capable：1；incapable：0)	－
Objectives of forest management (X_2)	Weight of wood production (X_{21})	Ordinal (0~100%)	＋
	Recreation development(X_{22})	Ratio (score 0~4)	－
Conditions of forestland (X_3)	Area (X_{31})	Dummy (over than 2ha : 1 ; otherwise：0)	＋
	Zoning (X_{32})	Nominal (forestland：1；farmland：0)	＋
Supportive resources (X_4)	Production cost reduction (X_{41})	Ratio (score 0~6)	＋
	Marketing (X_{42})	Ratio (score 0~5)	＋
	Subsidy and education (X_{43})	Ratio (score 0~4)	＋

2.2 Data collection

Survey of this study used two stage sampling processes. First, the study area includes five counties in Taiwan: Hsingchu, Nantou, Kaohsiung, Pingtung and Hualien county (Figure 2). These five counties were chosen because they have most private forests area in Taiwan. Second, researcher selected 17 townships, each township was chosen because it has most private forests area within counties, then randomly interviewed 10 people. Finally, researcher surveyed 170 forest owners and their 332 forestlands from 17 townships within five counties. Before a face to face interview survey, researcher will make an appointment in advance via telephone call. This survey was conducted September 8, 2011 to October 20, 2012.

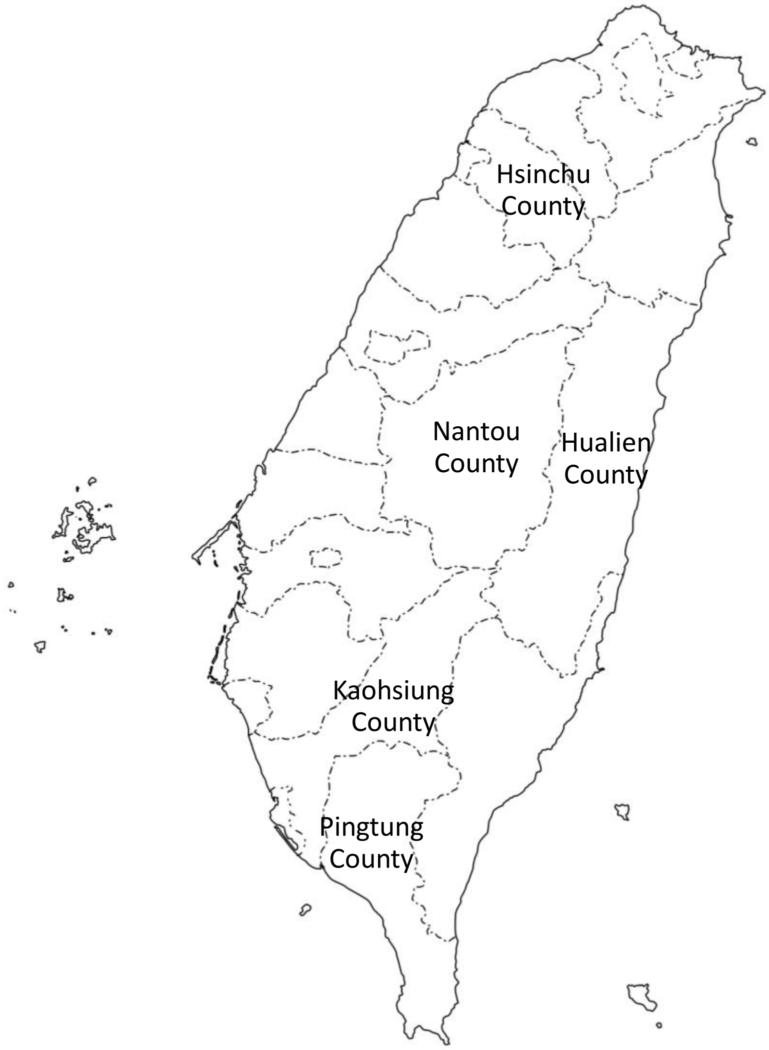

Figure 2: Location of study area in Taiwan

3 Results and discussion

3.1 Basic information of sampling landowners and forestlands

In this empirical research, "Male(73.5%)", average age was 61.4 years old, "45-64 years old(50.6%)", “high school level of education(47.6%)”, “family income derived from other work (60.6%)” were the basic information from sampled 170 forest owners. Most forest owners (77.1%) considered their forests had minor influence to household subsistence. Above descriptive statistical analysis was quite similar to Ko (1998), Lin and Lo (2004) and Lo (1995).

Because environmental education has popularized to the public in Taiwan, thus “soil and water conservation (81.4%)”, “water retaining (52.1%)”, and “sequestration of carbon dioxide in order to immigrate greenhouse effect (51.5%)” were most private owner perceive functions come from forests. On the contrary, “timber production” function of forest just was 35.3% (table 2). It is likely that most private forest owners pay attention to environmental conservation function than self-interest objective on timber or tangible production.

Table 2: Perception of sampling private forest owners to forest functions (multiple choice)

Priority	Forest functions	Frequency	%
1	Soil and water conservation	136	81.4
2	Water retaining	87	52.1
2	Sequestration of carbon dioxide in order to immigrate greenhouse effect	86	51.5
4	Environmental landscaping	70	41.9
5	Timber production	59	35.3
5	Water purification	55	32.9
7	Wildlife habitat	38	22.8
8	Recreation	29	17.4
9	Protection of agricultural production	13	7.8
10	Non-timber forest products (such as wild honey, jelly fig, etc.)	5	3.0
10	Arts and humanities	5	3.0
	Total	583	349.1

Meanwhile, statistical analysis of the sampled 332 parcel forests which were hold by 170 owners. Area size range from 0.1 to 125 ha, average just was 3.6 ha (median 1.0 ha). The planting trees species were very diverse and owner usually mixed planting 2-4 species in one parcel forestland. Hardwood species accounted for 65.6%, *Swietenia macrophylla, Swietenia mahagoni*, *Cinnamomum camphora*, *Michelia compressa*, *Zelkova formosana*, *Acacia confuse* and *Liquidamber formosana* were popular. Conifers species had 25.3%, *Calocedrus formosana*, *Cunninghamia lanceolata* and *Crpytomeria japonica*, were most common. But bamboo and other species were rare in this survey.

3.2 Willingness of sampling owners to participate in cooperation

112 (65.9%) owners among 170 samples were willing to participate in cooperation, as well as 218 parcels (65.1%) of 332 parcels forestland were willing to participate in cooperation. It showed that 2/3 of the private forest owners accepted cooperation initiative of private forest management plan. Besides, their preferred type of cooperation was “cooperatives (59.8%)”, “forest owners associations (22.3%)”, “entrusted contract (14.3%)”, but “company organization” only 1.8%. According to results of interview, the main reasons of the owners participate in cooperation were to reduce cost and to obtain assistance from the government. On the other hand, “owners lack confidence against the government”, “aging of landowner”, “low stumpage” and “small size” were main unfavorable factors of the owners participate in cooperation.

Hence, “financial assistance”, “counseling for cooperation organization”, “cooperative planning assistance", and "provides marketing information" were sampling private forest owners most expect instruments from the government (table 3).

Table 3: Sampling private forest owners expect supportive instruments (multiple choice)

Priority	Supportive instruments	Frequency	%
1	Financial assistance	102	73.9
2	Counseling for cooperation organization	89	64.5
3	Cooperative planning assistance	82	59.4
3	Provides marketing information	80	58.0
5	Strengthen communication among cooperative members	64	46.4
6	Research and development	33	23.9
	Total	450	326.1

3.3 Estimation of logistic regression

Table 4 presents the results of logistic regression on sampling owners' willingness to participate in forest cooperatives. Regression coefficient of determination Nagelkerke R^2 = 0.526, and Hosmer-Lemeshow goodness of fit statistics was not significant (P=0.076> 0.05). Therefore, it cannot reject this model has a good fitness of empirical data. Using this model to predict intentions of owners, the accuracy of classification=84.5%.

Table 4: Results of logistic regression on sampling owners' willingness to participate in forest cooperatives

factor	Explanatory variables	Coefficient (B_k)	Standard error (Se_k)	Wald Chi-square	P-value	Odds ratio Exp(B)
X_1 Forest owner management capacity	X_{11} Young forest owner	.705	.338	4.363	.037	2.025
	X_{12} Knowledge and skills of forest management	-.784	.345	5.164	.023	.456
X_2 Objectives of forest management	X_{21} Weight of wood production	.005	.005	1.283	.257	1.006
	X_{22} Recreation development	-.104	.185	.316	.574	.901
X_3 Conditions of forestland	X_{31} Area	.240	.353	.461	.497	1.271
	X_{32} Zoning	.807	.355	5.161	.023	2.241
X_4 Supportive resources	X_{41} Production cost reduction	.293	.138	4.514	.034	1.340
	X_{42} Marketing	.374	.114	10.784	.001	1.453
	X_{43} Subsidy and education	1.020	.190	28.894	.000	2.774
	Constant	-2.752	.579	22.611	.000	.064

Number of observations = 296; Nagelkerke R^2=0.526; Hosmer-Lemeshow P = 0.076; Predictive accuracy of classification= 84.5%

The sign of all coefficients in table 4 were to conform to RDT, six explanatory variables were significant. Younger forest owner (X_{11}) and less knowledge or skills about forest (X_{12}), land locates at forest zone (X_{32}), wants supportive resources from the government (X_{41}, X_{42}, X_{43}) were significant influence factors. But weight of wood production (X_{21}), recreation development (X_{22}) and area (X_{31}) three explanatory variables were not significant. Thus researcher discussed further as follows:

First, in forest owner management capacity factor: who is young forest owner and less knowledge or skills of forest management showed a higher willingness to participate in cooperative. This Phenomenon can be found recently. Many young private owners inherited forestland, their intentions of participate in cooperative were high, especially one of them lack of experience or skills of forest management. As owners participate in cooperative, they can share information each other, young or less experience owners can learn more about forest management knowledge and skills.

Second, in objectives of forest management factor: Because the forest owners' backgrounds were different as mention above, the forest management objectives (x_{21},) and perceived functions of forest owners (X_{22}) are diversified. It is possible that their intentions of participate in cooperative were independent with their forest management objectives. Therefore, cooperative management not only focus on timber production but also on multiple objectives development

Third, in conditions of forestland factor: It was expected that participation will be different with forest size and zoning. Since majority of sampling private forest scale are small, researcher cannot found what willingness is different between area bigger than 2 ha (X_{31}) and area below 2 ha. Besides, the rule of management decision of a cooperative is one people one vote, researcher believes that even forest area over 20 ha who owners were worry to lose autonomy of their forests, hence they would hesitate to cooperate with the other small-scale forest owners. Moreover, the land zoning (X_{32}) belongs to forestland that forest owner was higher 2.241 times willingness than that land zoning belongs to agricultural land. In fact, owners who plants forest at farm land was less constrained, majority of them are farmers. Agricultural organizations are thriving in Taiwan, but forestry organization is few. It means forest owners who land zoning belongs to forestland more aspire to participate in cooperative organizations.

The last, in supportive resources factor: three explanatory variables were all significant, it revealed that RDT has verified. It showed that "production cost reduction (X_{41})", "marketing (X_{42})", and "subsidy and education (X_{43})" were positive effects on owners' intentions of participate in the cooperative. The government should prepare several supportive instruments in order to encourage forest owners to participate in cooperative (table 4).

Overall, this empirical study applied resource dependence theory (RDT) which proposed four hypotheses. Logistic Regression model has validated three hypotheses. "Forest owner management capacity (X_1)" and "conditions of forestland (X_3)" had significant negative impact to " owner's willingness to participate in cooperative (Y)", but "supportive resources (X_4)" had significant positive impact to " owner's willingness to participate in cooperative (Y)". The second hypothesis (H_2), "Objectives of forest management (X_2)" had no significant impact to " owner's willingness to participate in cooperative (Y)".

4 Conclusions

Taiwanese private forest ownership is changing with urbanization, aging of owner, and intergenerational transfer. In this empirical research, researcher found that private forest size average was just 3.6 ha (median 1.0 ha). Their lands planting species were very diverse and usually mixed planting 2-4 species in one parcel forestland. It is possible that private forest owners pay attention to environmental conservation function than self-interest objective on timber or tangible production. In order to pursue the balance of environmental conservation and self-sufficiency of timber production, forestry management usually requires big scale in order to realize economic benefit and complete environmental quality requirement.

Survey results showed two thirds of the private forest owners will accept cooperation initiative of private forest management plan. Researcher applied RDT (Pfeffer and Salancik, 1978) to form four hypotheses and using logistic regression to validate what factors significant affect private owner's willingness to participate in cooperative. The RDT suggested that no one individual or organization can be completely self-sufficient in limited resources, lack of resources in a business, everyone need to rely on outside supply of resources, it will inevitably create a joint relationship with the outside world.

Using logistical regression to predict empirical intentions of private owners, the accuracy of classification was 84.5%, and three hypotheses have validated in this model. Forest owner management capacity and conditions of forestland had significant negative impact to owner's willingness to participate in cooperative, but supportive resources of outside had significant positive impact to owner's willingness to participate in cooperative. Therefore, in the beginning of encourage private owner to cooperate, financial assistance, counseling for cooperation organization, cooperative planning assistance, and provides marketing information are useful instruments by the government.

Forest management must concerns economic, social and environmental issues toward sustainability. Past Taiwan forest policy only emphasized the reforestation on private forestland by subsidy program. It should change to product- or service-oriented policies in order to increase the level of timber self-sufficiency of private forestry. Empirical results can suggest that new policy should aggregate private forests owners in planning potential production region, understand needs or lacks of the knowledge or skills of the private forest owners, and encourage them to form a vertical alliance of different forestry industries. The cooperative organizations can provide a platform that it can deal with financial assistance, facilitate communication and share market information with private owners.

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[AS2-4]

Motivations for cross-boundary interactions among neighboring woodland properties in West Virginia, USA

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1 Introduction

State and federal agencies in the United States, along with associated nongovernmental organizations, are supporting and developing programs that engage multiple woodland ownerships on a landscape scale in order to promote effective woodland stewardship and increase the amount of property under sustainable management. Privately-owned woodlands are a dominant feature of local and regional landscapes in most parts of the eastern United States comprising an estimated 128 million hectares of land representing 76% of the total land area in the north and 88% in the south (Smith et al. 2003). These vast woodlands are the source of environmental services that are used, enjoyed, or relied upon by millions living in close proximity. Promoting stewardship efforts on these wooded properties has been a challenge, especially with nonindustrial private landowners, as they number 9.1 million in the eastern US (Butler and Leatherberry 2004) and each of these owners can have unique objectives for their respective properties.

Conservation efforts on broad scales require collaborations among landholders within a landscape of interest (Gleason et al. 2013). Landscape scale programs necessarily involve landowners who are willing to work across property boundaries; many of the issues that are being addressed by conservation organizations and agencies involve biotic and abiotic ecosystem components that do not conform to legal and administrative boundaries.

In this paper, we continue an exploration of informal woodland owner cooperation in the state of West Virginia, USA (see McGill and McCuen 2012). Our research investigates cross-boundary interactions between adjacent neighbors. Here, adjacent neighbors are those who share physical property boundaries and all of the social and legal aspects of those boundaries (Brunson 1998, Meindinger 1998). Our primary objective is to document the types of interactions that woodland owners have with adjacent neighbors and to illuminate possible motivations that could be used by natural resources agencies in connecting with family forest owners.

2 Materials and Methods

Data for this assessment was generated using a mailed questionnaire designed to explore cross-boundary relationships of woodland owners in West Virginia. Three priority areas were designated

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for sampling. Regions included: 1) the Eastern Panhandle (Berkeley, Jefferson, and Morgan counties), often thought of as a bedroom community for the Baltimore/Washington, D.C. area, 2) the Technology Corridor (Monongalia, Harrison, Marion counties) and 3) the highly developed Metro Valley (Kanawha, Putnam, Cabell, Lincoln counties).

The intended target groups were *new* property owners and an equal number of *established* property owners. For the *new* property owners, we compared the owner names associated with each parcel in the 2009 and 2010 tax years; properties with different landowner names were selected as properties that had been transferred and therefore had new property owners in 2010. We obtained the 2006 tax records from the WV Tax Department and with the same nine counties, compared the 2006 database with the 2010 database. Properties that had the same owners were selected as "established" ownerships. For each county, we selected an equal number of "established" landowners as had been found in the "recent" landowner category. However, established landowners in Kanawha County were not selected as this county had a different type of tax filing system and consequently we could not follow the same procedure to identify established owners for this county. The total number of addresses gathered in this process was 1689 of which 900 were found using the recent landowner process and 789 were found using the established landowner process.

Questions were formulated to document property characteristics, woodland activities, cross-boundary management activities, woodland stewardship education, and demographics. Questionnaire items inquired about the number of adjacent landowners, the frequency and quality of communications with those landowners, and shared resources and work activities. Questions were also designed to confirm the number of years a property had been owned, its size, proportion of property in woodlands, method of acquisition, and who makes ownership decisions. This survey was reviewed by a panel of two WVU faculty members and two private woodland owners.

We used a Dillman (2000) mailed survey process to generate information on woodland owner cross-boundary cooperation. A pre-survey postcard, acover letter for the questionnaire mailing, a reminder postcard, and a cover letter for the second mailing of the questionnaire were approved by the West Virginia University Institutional Review Board (IRB). With IRB approval, surveys were coded to correspond to the names of each landowner. A cover letter asking and explaining the need for each landowner's cooperation was included with the survey along with a pre-paid return envelope. Following Dillman's (2000) recommendation of providing an incentive, a colorful magnet with a link to the West Virginia Woodland Stewards social network (http://wvstewards.ning.com) was attached to each survey. All 1689 questionnaires were sent out on January 23rd, 2012.

Variables of interest to this paper were short answers within the questionnaire that asked two primary questions: 1) do your neighbors ever help with work in your woodlands (along with the follow-up asking what type of work), and 2) what are the most common reasons for communicating with your neighbors? Using an emergent category process, preliminary categories were pulled from the short answers for these two questions based on common themes. Each response was categorized accordingly. Responses with compound answers were given multiple codes, to correspond to each portion of the response. After this initial classification of the data a second coder added additional categories to catch emergent themes that did not fit into the existing themes. This iterative process allowed both coders to categorize all data into themes with a small portion falling into an 'other' category.

To explore motivations and attributes that could be associated with a willingness to work across boundaries, we used the response to our primary question "do your neighbors ever help with work in your woodlands." This response was used (NHELP) as a measure of cross-boundary work for two reasons: 1) work was done by or in collaboration with a neighbor on the respondent's property, and 2) it indicated a desire or recognized need for a specific type of work to be accomplished to further ownership objectives. NHELP is a binary variable that indicates the respondents neighbors have help with work in their woodlands

Table 1: Variables used to explore associations with NHELP.

Explanatory variables	VAR type	Description
-----*Property attributes*-----		
RESIDENCY	Binary	Live on property vs. absentee
TIME	Binary	New vs. established (>=5-yrs); describes the length of ownership tenure
AREA	Continuous	Total property area (hectares)
-----*Management aspects*-----		
PROFFOR	Binary	Have contacted a professional forester
SOLD	Binary	Have sold timber from property
TIMVALUE	Binary[a]	Perception of timber value; 1=a lot/some, 0=not much, none
-----*Social affiliation*-----		
RELATIVES	Binary	Shares a boundary with relatives
SOCIALIZE	Binary[a]	Interest level in socializing/discussing productive woodlands; very vs. not at all
NETWORK	Binary[a]	Interest level in building woodland owner network; very vs. not at all
TOUR	Binary[a]	Interest level in touring one another's woodlands; very vs. not at all
YOUHELP	Binary[a]	Willingness of respondent to work with neighbor; very vs. not at all
NEIGHBORHELP	Binary[a]	Willingness of neighbors to work with respondent; very vs. not at all
-----*Demographics*-----		
GENDER	Binary	Female=1, male=2;
AGE	Binary[b]	60+ yrs old vs. <60 yrs old
INCOME	Binary[b]	$60,000 + vs. <$60,000 annual income

[a] These variables were derived from 4-point Likert scales; binary variables were generated by combining the two high categories and the two low categories.

[b] These variables were ordinal scales; AGE had 6 categories of roughly 10-year ranges, INCOME had 7 categories of $15,000 ranges. Binary variables were generated by using the approximate median value of these variables.

in the past or currently do so. Fifteen variables were examined for their association with the responses variable NHELP (Table 1). These were selected to represent four types of questions within the mailed survey: property attributes, management aspects, social affiliation, and demographics. Tests of independence among variables and exploration for potential associations among variables of interest were carried out using frequency and logistic regression procedures in SAS/STAT version 9.3 software (SAS Institute Inc., Cary, NC, USA). Significance levels were assessed at the alpha=0.10 level.

3 Results

3.1 Questionnaire responses

Of 1689 questionnaires that were sent out to prospective new and established woodland owners, 798 (47%) were returned. Of these, 385 were good responses and 7 partial responses. The remainder of the returned questionnaires were bad addresses (12%), explicit and implicit refusals (8%), ineligible (no longer owned property; 3%), and deceased (1%). There were 893 noncontacts. The overall survey response rate was 24% (based on AAPOR 2011; response rate RR2). The cooperation rate for the survey was 72% (AAPOR 2011; cooperation rate COOP2).

3.2 Work with adjacent landowners

Nearly one out of four respondents (23%) stated their neighbors have helped them with work in their woodland properties. Eighty-five percent of those woodland owners receiving help from neighbors elaborated on the types of activities that were typically carried out. Tree and brush cutting were by far the most commonly cited work activity among neighbors. Just over half (51%) of the respondents listed work

Table 2: Types of activities woodland owners carried out with or for their neighbors.

Activity	Description/key words/example responses	Percent
Tree and brush cutting	Firewood, brush and tree removal, cutting downed trees, clearing, burning wood	51
Roads/access	Snow removal, road clearing, trails, clear access path, trails for the horses, road maintenance	27
Boundaries/fence	Posting, fence, survey	16
Other	Uses my spring, maintenance, general help, tree planting	12
Equipment loan/help	Loaning equipment, using heavy equipment, tractor help, helped in clearing house site	11
Mowing	Mowing, trimming grass	10
Farming	Cattle, field we cut together, gardening, hay	10
Wildlife management/hunting	Hunting, tree stands, hunts on my property	8
Security	Oversight, vandals, thieves, security, fire fighting	8

items related to tree and brush cutting or removal (Table 1); this category combined cutting downed trees to increase access to properties, cutting and burning brush for clearing grown over areas, and any activity related to firewood production. Firewood was an important subcategory of this activity making up 21% of the total tree and brush cutting category.

Cross-boundary work related to roads and access was another common interaction. Over one in four (27%) listed an activity associated with this category. Undoubtedly, property access and roads were shared in many cases, although few responses indicated this explicitly. Activities related to roads were fairly general like "maintaining roads," "help with the trails," and "clear access path," but also specific items like "snow removal" and "make trails for the horses" were placed in this category.

When asked about the most common reasons for communicating with their neighbors, only five of the 237 respondents (2%) answering this question said they never talk with their neighbors. Over half (59%) of the respondents listed some type of neighborly interaction as a common reason for communicating with adjacent property owners (Table 3). Neighborly interactions included friendly conversation, friendship, socializing, and instances when they might meet one another in their communities (e.g., at church or the

Table 3: Reasons for communicating with adjacent neighbors. Percentages sum to greater than 100% due to multiple reasons listed by respondents.

Reason	Description/keywords/example responses	Percent
Neighborly interactions	To maintain good relations, visiting, passing by, chance meeting, personal contact, just to keep in touch, to be neighborly, gossip, see them at grocery store, church, advice, mail pick up when on vacation, to borrow something, to be aware of current events that may affect us	59
Recreational activities	Hunting, recreation, fishing, permission to hunt	10
Security	Crime watch, security, unauthorized visitors or activities, to know if there's an emergency we can call on each other, watching out for each other's property, fire	9
Stray animals	Animals out, cattle in other fields, cattle leaving property, dogs or stock wandering	9
Family members	Family, relatives, brother, sister	8
Boundaries/fencing	Pipeline right-of-ways, property boundaries, boundary fences, line fence, boundary disputes, posting land, keep them on their own property	8
Roads and access points	Access, right-of-ways, snow, road issues, snow removal	8
Farming activities	Farming, use of farming equipment, crops, mowing	6
Other		6
Weather events	How damaging weather has affected their property, storms, flood damage, help out in bad weather	2
Utility issues	Utilities (electric, phone, etc.), high-speed internet accessibility	2

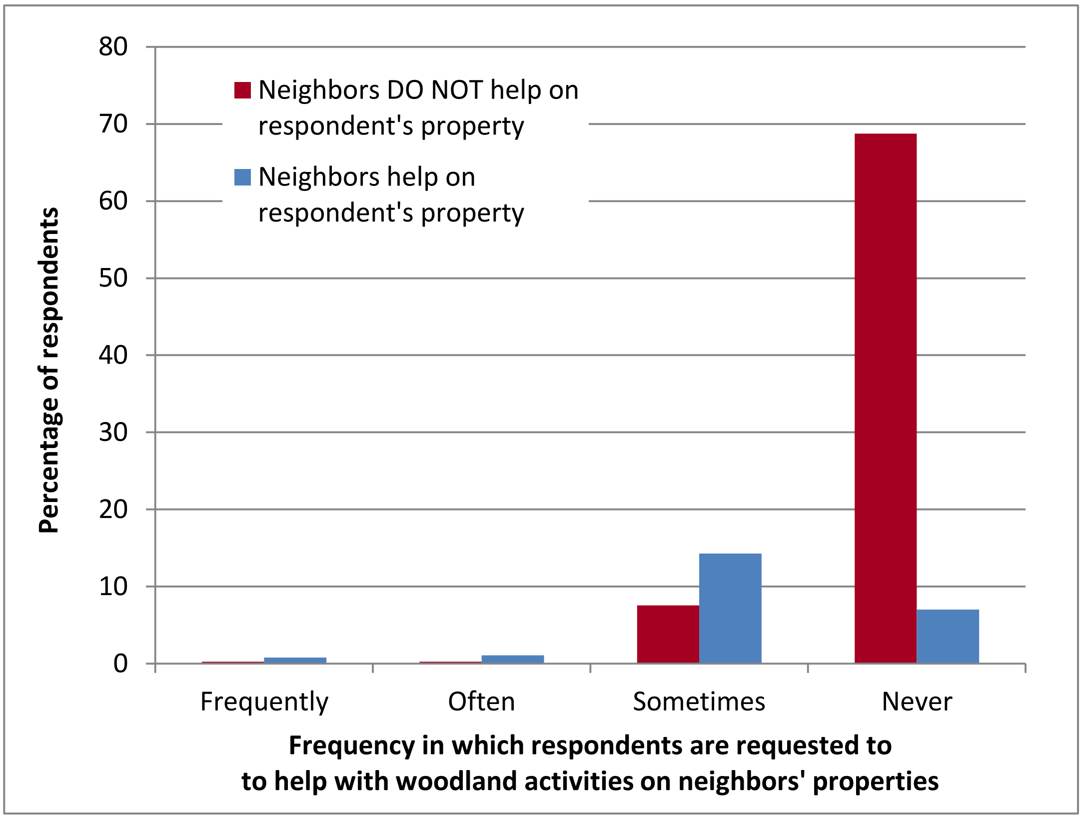

Figure 1: Cross-boundary help with woodland activities based on 371 responses. Bars represent the levels of the variable NHELP that indicates whether work has been carried out by neighbors on the respondent's property.

grocery store). Similar percentages of respondents were present for recreational activities (10%), security (9%), stray animals (9%), the fact that they were family members (8%), boundary issues (8%), road or other access issues (8%), and farming (6%). Some listed specific issues like discussing weather events (2%) and specific utility issues (2%).

Cross-boundary assistance across adjacent boundaries is generally a cooperative, two-way, give-and-take phenomenon. Adjacent neighbors who do not help with work activities on the respondents' properties generally do not call upon the respondents to help on their properties (Figure 1). Respondents who had their neighbors' help had nearly 20 times the odds of helping on their neighbors' properties (odds ratio(OR)=19.6; n=371; χ^2<0.001).

3.2 Factors associated with cross-boundary woodland activities

NHELP was statistically related to 7 of the 15 variables used in univariate logistic analysis. Two property attributes, RESIDENCY and TIME were found to have positive associations with NHELP. Residents—those living on their respective properties—had 68% greater odds of indicating that they had neighbors help them on their properties. Woodland owners whom had owned their properties for five years or less had 77% greater odds of receiving help on their properties.

None of the management aspect variables were statistically related to NHELP. Three social affiliation variables were found to be related to NHELP. NHELP was closely associated with NEIGHBORHELP. Respondents who indicated their neighbors were willing to help had 5.5 times the odds of having already been helped (Table 4). This finding was clearly not a surprise and is in some sense a measure of internal consistency in our questionnaire. There was also statistical significance in the association between NHELP and a respondent's willingness to help their neighbor (YOUHELP; OR=3.06; P<0.001). In addition to the willingness variables just mentioned, respondents who indicated they were interested in getting together with other woodland owners to build a woodland owner network (NETWORK) had 66% higher odds to have received help from neighbors than those not interested in this type of activity.

Two demographic variables were related to NHELP. Respondents in the 60+ year-old age class had 42% less odds of having received help from neighbors than those respondents in the under-60 age class. Those in the >$60k income bracket had 59% greater odds of having been helped by neighbors.

Table 4: Univariate logistic regression using the binary response variable NHELP ("Do your neighbors ever help with work in your woodlands") and selected explanatory variables. NHELP was modeled as "yes" with respect to explanatory variables.

Explanatory variables[a]	n	OR[b]	90% CI[c]	$P > \chi^{2d}$
-----*Property attributes*-----				
RESIDENCY	365	1.86	1.21–2.84	0.017
TIME	344	1.77	1.10–2.83	0.046
AREA	352	0.99	0.99–1.00	0.366
-----*Management aspects*-----				
PROFFOR	363	0.67	0.39–1.15	0.221
SOLD	365	0.92	0.57–1.49	0.783
TIMVALUE	357	0.88	0.56–1.40	0.656
-----*Social affiliation*-----				
RELATIVE	366	1.51	0.99–2.30	0.106
SOCIALIZE	371	1.47	0.91–2.37	0.183
NETWORK	371	1.66	1.05–2.62	0.067
TOUR	371	1.28	0.77–2.12	0.430
YOUHELP	354	3.06	1.89–4.95	<0.001
NEIGHBORHELP	322	5.55	3.44–8.94	<0.001
-----*Demographics*-----				
GENDER	366	0.74	0.48–1.15	0.262
AGE	366	0.58	0.38–0.88	0.033
INCOME	312	1.59	1.03–2.46	0.078

[a] Logistic regression using binary dependent variable 'NHELP', [b]Odds ratio (OR), [c]90% confidence interval of the odds ratio point estimate, [d]Probability values for Wald χ^2 test for respective explanatory variables

4 Discussion

In exploring cross-boundary interactions among adjacent woodland owners in three priority areas of West Virginia, we found that almost one in four woodland owners had neighbors who had helped them with work on their properties. Cross-boundary work was classified into 8 categories, the most frequent type of work was cutting trees and clearing brush. While not examined in depth here, much of this tree and brush work was likely due to natural disturbances that cause trees to fall over access roads and trails. In fact, road and access work was listed as the second most common type of cross-boundary activity carried out by the respondents of this survey.

Davis and Fly (2010) have shown that some woodland owners do not perceive themselves as "forest managers" although they are involved in activities that would be considered management by professional natural resource managers. Few woodland owners listed cross-boundary activities that might be considered traditional forestry practices. For example, no mention was made of invasive species or grapevine control, forest thinning, or timber harvesting. Tree planting was so uncommon, that it was categorized into the general "other" category. Firewood cutting, however, was a frequent activity. Some respondents alluded to active cutting of trees for this purpose while others suggested that firewood was cut from trees that had fallen naturally, either from old age or from severe storm events. In future research, it would benefit the informal firewood market that exists in West Virginia to find out how they might capitalize on working with woodland owners to access a wood supply for their purposes while making the woods safer and more productive through improved access (removal of fallen trees) and stand improvement thinning.

Many research efforts that explore private woodland owners' motivations and management priorities use timber-related actions to specify whether a landowner is active in managing their woodland. These actions frequently include intent to harvest timber, whether a landowner has a forest management plan or whether they have contacted a professional forester (e.g., see Butler and Leatherberry 2004). Using these types of attributes to quantify or document woodland management leads to what Davis and Fly (2010) call a "mismatch" in understanding between private woodland owners and natural resources professionals. Kendra and Hull (2005) asked new woodland owners in Virginia about constraints to land management actions and found that the most commonly listed constraint was that the owners had just not thought about it. Timber harvesting, for example, is an event that can take place rapidly and then never come again in the lifetime of a woodland owner. So for a given property, timber harvesting can be considered a rare event whereas activities related to maintaining the woodland property is annual or continuous. With respect to cross-boundary activities, woodland owners in our survey most frequently work with neighbors in maintaining access roads, cutting or harvesting fallen trees for firewood or to reopen access routes, and boundary work to reduce trespass or keep fences maintained.

In the everyday lives of woodland owners in West Virginia, most communications with adjacent neighbors are not about working with the woods. By far the most common reason woodland owners communicate with adjacent landowners is simply to be neighborly. This points to how cross-boundary collaborations might follow the analogy of Kittredge (2004) where property owners have thoughts and objectives for their woodlands "running in the background," much like a virus protection program; it comes to the forefront when an issue is faced. Day-to-day activities bring up reasons for talking with neighbors like recreational use of the property, security concerns, boundary issues, and farming needs. These informal peer-to-peer contacts are likely a key source of information related to property management and might be further studied to explore ways natural resources agencies can interact with local woodland owners to provide options that might allow simultaneous benefits to property owners to improve the health and productivity of their woodlands and to the general society who rely on environmental services that originate from these woodlands.

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[AS2-5]

Who they talk to:

Formal and informal sources of information for woodland owner decision making

David B. Kittredge[1]

1 Introduction

Forests provide invaluable services, and nationally a significant portion of them are owned by millions of individual, private decision makers. Butler (2008) reports that the vast majority of owners (92%, representing 87% of all family forest lands) make management decisions for their land on their own, with a very small minority relying on the advice of professional foresters. Nationally, Butler (2008) goes on to report that 4 % of family forest owners (representing 17% of family forest land) have a professionally prepared management plan for their lands. It is clear that family forests in the United States are important, yet millions of owners are apparently not making decisions on the basis of professional advice. Our goal was to improve our understanding of who landowners seek information from when making decisions about their forestland. More specifically, our objective was to explore the possible role of egocentric social networks that landowners may rely upon for information when making a decision. Can we estimate their composition, the possible role of professionals, and the nature of the relationships, in terms of involvement, helpfulness, and trust? Finally, we explored landowner egocentric networks in two similar and adjacent states (Vermont and New Hampshire) that have different programmatic approaches to reaching landowners. Do these result in different ways that landowners acquire information?

2 Background

Decades of research on private family forest owners has generated a composite impression of them as generally sharing non-consumptive or appreciate objectives for their land (e.g., Butler 2008, Birch 1996, Butler et al 2004, Kingsley 1976, Kingsley and T.W. Birch 1977, Belin et al 2005, Davis and Fly 2010). These include desires for privacy, nature appreciation, outdoor recreation, aesthetics and part of a residence, and environmental protection. The same understanding of landowner preferences consistently shows a disinterest in timber harvesting, the generation of revenue, and management. This aligns well with the documented behaviors of landowners, most of whom nationally choose not to have management plans for their land, in spite of financial incentives (e.g., property tax reduction, cost sharing the expense of the plan). On the other hand, evidence exists that there is a gap between professed attitudes (e.g., disinterest in harvesting) and behaviors. McDonald et al (2006) showed that though landowners express disinterest in

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harvest, roughly half the harvesting in Massachusetts over a 20-year period is on private family forest. In a conceptual model of family forest decision making (Kittredge 2004), landowners continue to enjoy their land in an appreciative, non-consumptive way, generally without professional planning, advice, or information, but occasionally if a financial need arises (e.g., tuition bill, medical procedure, divorce), landowners may make a reactive decision to harvest or sell some or all of their land. Sources of information, and how people reach their decision play an important role in this reactive mode, and the results manifest themselves out across landscapes dominated by this ownership type.

There is emerging evidence that a disconnect exists between family forest owners and foresters or natural resource professionals. Davis and Fly (2010) for example, showed that land owners and professionals perceive the notion of management differently. Landowners may perceive themselves as managers of their land, though not by professional standards. Gootee et al (2010) showed that many non-professional landowners have a skepticism of scientific credentials and thus place little importance in information or messages from professionals. The owners in their study placed more importance on the "social impressions" of the people delivering information. As Gootee et al (2010) describe, landowners "resisted professionals who cast themselves as ‘experts’ and the forest owner as ‘inexpert’." In light of small fraction of American woodland owners who avail themselves of professional information, and the misalignment between demonstrated landowner interests (e.g., nature, privacy, aesthetics) and those of professional providers (e.g., forest management, program enrollment, distribution of incentives, and timber harvest), it is worth further exploring social networks as a means to enhance communication between owners and others to provide information at the time of a decision. Vibrant, rich social networks between and around owners could result in greater flow of information and experiences, connect owners with professional sources of assistance at the right time (i.e., when the owner is poised to make a decision), and ultimately result in more informed decision making.

3 Study Area

We chose the similar states of New Hampshire and Vermont in the northeastern United States as a study area. Roughly 80% of the landscape is wooded (Smith et al 2009), and between half and two thirds of this forest is owned by approximately 200,000 private family forest entities (Butler et al 2011). Average size of these ownerships is small (i.e., 19 acres in NH; 36 acres in VT). The forest policy approaches to reaching and assisting family forest owners in the two otherwise similar states are quite different. In New Hampshire, each county has a University of New Hampshire Cooperative Extension Forestry educator who provides education and outreach programming for private woodland owners and the general public. In Vermont, each county has a forester employed by the state's Department of Forests, Parks, and Recreation. County Foresters in Vermont provide direct technical assistance to owners, and administer the state current-use property tax program.

4 Methods

We selected 5 towns in the southwestern-most county in New Hampshire, and 5 towns in the southeastern-most county in Vermont for sampling. We then contacted local property tax assessors in each town and acquired a list of all landowners. We excluded ownerships of less than 10 acres. We selected 100 landowners randomly from each town, for a total original sample size of 1,000.

Our work was guided by a pilot study of private woodland owners and their egocentric networks (Kittredge et al 2013), conducted in central Massachusetts in 2008. This study used structured interviews with 47 woodland owners to explore the possible role of informal social networks in two explicit decisions: harvest timber or place an easement on their land. Interview subjects were asked a series of questions about the possible contacts they have in terms of their woodland, and the extent to which these contacts may have been involved with the decision. In an effort to expand our sample, we developed a survey instrument that asked respondents to complete a table, listing the initials of relevant contacts (maintaining anonymity), the type of person (e.g., friend, family member, neighbor, woodland owner, forester, logger), and indicating the extent to which each one is involved in a decision, helpful, and trusted. We provided 18 blank lines in the table, based on our pilot results suggesting an estimated network size of 7-10 people. Due to a concern about respondent fatigue, half the surveys used this detailed table to gather data, and the other half used a broader, more generic, and less detailed means to solicit network information. Results of the specific table are reported here.

We followed a modified Dillman method for mail surveys (Dillman 2000), with a cover letter, survey booklet, and postage paid return envelope. We used two waves of mailing to respondents.

5 Results

5.1 Overall response and demographics

We received 509 responses overall, and after accounting for undeliverable surveys, this represents a return rate of 53.3%. The Vermont response was 54.7% and for New Hampshire was 51.9%. An exact binomial test of goodness-of-fit examining the difference between NH and VT response indicates no significant difference ($p=0.425$) between states.

We analyzed response time to detect possible differences between early and late respondents, to indicate the possibility of non-response bias, after Armstrong and Overton 1977. Average response time of the 509 responses was: 20.2 days (std deviation = 17.2 days, median = 18 days, minimum = 2 days, maximum = 199 days). Using Kendall's tau and Spearman's correlation tests, the elapsed response time (in number of days for the survey to be returned) was not significantly correlated with: acres, year acquired (ownership tenure), absentee vs. resident ownership, age, or attained education level (a surrogate for income level). No correlation between early and late responders suggests no difference between responders and non-responders.

Respondents fit the common profile of private woodland owners for the northeastern United States. They own an average of 65.9 acres. Roughly two thirds (64.2%) live on or beside their land, while 20% are more than 100 miles from it. Approximately half the respondents spend time on their land once or more per week. They have owned their land for an average of 21 years, and 75% of them purchased it. Slightly more than half are individual ownerships, with roughly a third being jointly held. Roughly two thirds of respondents are male, and the average age of respondents is 61.3 years. Highest attained education level is quite high, with 38.6% of respondents having a graduate or professional degree, and 24.8% having a bachelor's degree. There are no appreciable differences between Vermont and New Hampshire respondents. Ownership goals of the respondents strongly favor the non-consumptive or appreciative reasons for landownership.

5.2 Social network structure

The subset of surveys using a detailed table enabled us to explore at a higher resolution or in more detail the possible egocentric social network size, structure, and composition around responding woodland owners. We asked respondents to include people based on the following prompts:

> We're interested in people you may talk to about your land. IMPORTANTLY, we're just interested in **the number and kinds** of people you talk to. Please just use their initials. We are not interested in their actual name or identity, and your responses to this survey are anonymous.
>
> Please list the initials of:
>
> 1) All the people you know who have visited your land in the last two years
> 2) All the people whose land you have visited in the last two years
> 3) All the people who you've talked to about your land in the last two years, even if they have never visited it (and maybe don't live nearby). These could be people like an acquaintance from church, the mechanic who works on your car, or someone you know from a completely different context.

A total of 238 respondents from NH and VT returned the specific social network version of the survey. Of those, 188 respondents (i.e., 79%) listed at least one person in the table. 50 respondents (i.e., 21%) returned the survey and completed other aspects of it, but did not list people in the table. Mean overall network size based on these prompts was 11.7 people (median = 9, min = 1, maximum = 63; Table 1). This overall size compares favorably with the estimated network size reported by Kittredge et al (2013) when using the same prompts in a structured interview format. Based on the nature of the prompts, it is not surprising that the reported networks are dominated by friends, family members, and neighbors. Two thirds or more of the reported networks had contacts of this type. Roughly half of the reported networks had at least one woodland owner or local person, and roughly a third included a logger or private forester. Only 14 percent of 188 reported networks included a public forester. Approximately 20 percent had a land trust or conservation organization member.

When network composition by state is compared, there are few differences (Table 2). Only in the case of family members did the reported networks show a significant difference in terms of composition. Woodland owner egocentric social networks for 188 people are otherwise roughly the same size and composed of the same kinds of people in similar proportions.

Table 1: Egocentric social network composition of NH and VT respondents who entered at least one person in the table.

variable	# cases	% of total cases	mean	max	min	median
Total contacts	188	100%	11.7	63	1	9
Family	139	73.9	3.6	20	1	2
Neighbor	126	67.0	2.4	10	1	2
Friend	145	77.1	3.8	45	1	2
Woodland owner	89	47.3	3.2	17	1	2
Local	90	47.9	3.5	19	1	2
Logger	60	31.9	1.4	6	1	1
Private forester	73	38.8	1.2	3	1	1
Public forester	27	14.4	1.1	2	1	1
Land trust or con org member	41	21.8	1.5	9	1	1

Table 2: Network composition by state. (120 VT respondents returned the survey. Of those, 99 actually completed the table; 118 NH respondents returned the survey, and 89 of them actually completed the table. This is a total from the two states of 188 respondents who completed the table.)

Network component	% of responding cases (VT) where this type was mentioned	% of responding cases (NH) where this type was mentioned	Mean #/respondent, VT	Std error VT	Mean #/respondent NH	Std error, NH	Mann Whitney test
Family member	78	70	4.2	0.433	2.8	0.433	0.035
Neighbor	70	64	2.4	0.198	2.5	0.198	0.832
Friend	79	75	3.5	0.346	4.1	0.346	0.914
Woodland owner	43	52	3.5	0.486	2.9	0.486	0.221
Local	48	47	3.9	0.589	3.0	0.589	0.306
Logger	30	34	1.5	0.224	1.3	0.224	0.818
Private forester	40	37	1.2	0.067	1.2	0.067	0.969
Public forester	14	15	1.1	0.097	1.1	0.097	0.593
Conservation person	20	24	1.4	0.150	1.6	0.150	0.958
total	100	100	12.4	1.021	10.9	1.021	0.105

6 Discussion

Family members, friends, neighbors, and other woodland owners were cited by landowners as some of the most frequently contacted people (Tables 1 and 2). These non-professional individuals were cited more often than professional contacts. It is clear they are important sources of information and advice. In fact, only 38.8% of reported networks included a private forester, and 14.4% included a public service forester (Table 1). This implies that many landowners are receiving no professional advice whatsoever.

These egocentric networks around woodland owners appear diverse (i.e., a variety of people) and redundant (i.e., multiple types of the same kind of person). What remains unknown, however, is the extent to which these network contacts are actually connected to one another in a true network. Our data merely reveal the number and type of contacts or connections that individual landowners have.

Interestingly, though the two states have significantly different programs and policies for reaching private woodland owners through public service foresters (i.e., Vermont focuses on one-on-one technical assistance to owners, and New Hampshire focuses on Extension education and outreach), there are no differences in network composition between the two states (Table 2). Neither an education / outreach focus, nor a personal one-on-one technical assistance approach results in more public foresters in a network (e.g., 14% of reported VT networks had a public forester; 15% of reported NH networks had a public forester).

This method of soliciting social network composition and information through a mail survey yields valuable data, comparable to more laborious structured interviews which can be limited in sample size.

7 Conclusion

These results improve our understanding of the ways landowners acquire information about their land. They agree with previous studies on networks and owners (e.g., Kittredge et al 2013), and with other results that suggest few owners have professionally prepared management plans or contact with foresters (e.g., Butler 2008). These results suggest the way to provide owners with information may be through these documented networks dominated by non-professionals. In particular, peer woodland owners who have experience with foresters can steer other owners to foresters, in the role of a connector or spanner.

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[AS2-6]

Steps towards Peer-Learning-Based Forest Owners' Guidance

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1 Introduction

The challenge of forest extension is to engage enough woodland owners in the sphere of guidance (Salmon et al. 2006) in order to encourage them to make informed decisions regarding their forests and act accordingly (Sim and Hilmi 1987). At the moment, the task to engage owners is particularly demanding due to new uses of forests, diversified ownership structure and varied objectives of owners (Wiersum et al. 2005). In a previous study, it has been noted that when adopting and evaluating forest-related information, owners' willingness to adopt new information is highly dependent on their perceptions of the person delivering the information (Gootee et al. 2010). Therefore, forest owner extension could benefit from peer learning which emphasises the mutual respect and non-hierarchical structures of information exchange. The members of a relatively homogenous group or people having somehow similar identities can be called peers (McPherson et al. 2001). In peer learning, a group of similar people learn from each other instead of learning from a professional teacher (Boud et al. 2001; Topping 2005). Peers share the same broad knowledge base and therefore, it is easy for them to share information and learn (Reagans and McEvily 2003).

In this study, forest ownership is believed to constitute sufficient "peerness" and peer learning is seen as a way to complement traditional means of forest owners' extension. Among forest owners, the importance of peer forest owners in information delivery has been highlighted already by West et al. (1988). In addition, a more recent study from the US supports the idea that peer forest owners have an important role in owners' decision making (Knoot and Rickenbach 2011). Peer learning can attract inexperienced or otherwise indifferent forest owners and increase their knowledge of reasonable sources of forest information (Ma et al. 2012; Kueper et al. 2013). In Finland, most forest owners have diverse objectives and they are willing to learn, which implies a potential demand for new forms of education (Hujala et al. 2009; Hujala et al. 2013). Therefore, new models and procedures of extension are needed in order to increase peer learning and gain the benefits that it could offer.

First, we will present the forest owner related peer learning concept that is defined according to previous peer learning theory from educational sciences (Topping 2005; Hamunen et al. 2013a). Second, we will present existing peer learning events as well as opinions and practical suggestions given by forest owners and forest professionals about the present state of peer learning and promotion of it (Hamunen et al. 2013b). Finally, we will compare the theoretical peer learning concept and practical suggestions in order to

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give suggestions for how to develop peer learning among Finnish forest owners.

2 Data and analysis

2.1 Focus group interviews

Seven focus group interviews (Krueger and Casey 2009) were conducted between December 2010 and January 2011. The aim of the interviews was to gather information on the present state of Finnish forest owners' peer learning and interviewees' ideas about how to promote peer learning. The interviewed groups consisted of national developers of extension systems, local forest planning and extension professionals and private forest owners. Each group included 4–7 people. Altogether, 43 people participated in the focus groups. Instead of interviewing only owners, it was assumed that professionals and developers are familiar with owners' behaviour and they can offer an even broader perspective when planning the development of current extension practices. The questions considered the topics that forest owners discuss with each other, who other owners are to discuss with and where do owners meet each other. In addition, possible benefits and drawbacks of peer learning were discussed. Interviews were recorded and transcribed.

2.2 Qualitative theory-driven content analysis

The theoretical dimensions of peer learning (Topping 2005) were modified into eight forest-owner-related dimensions (Hamunen et al. 2013a). Dimensions were further divided into continuums that describe the extremes of the dimensions. The data collected from focus group interviews was analysed with qualitative theory-driven content analysis (Krippendorf 1980). From the focus group interviews, the events in which forest owners' peer learning can happen were extracted and the elements of these events were studied in more detail (Hamunen et al. 2013b). In addition, interviewees' beliefs and attitudes concerning challenges and possible solutions in existing or in possible peer-learning practices were identified. Finally, in the analysis, the theoretical definition of genuine peer learning (Hamunen et al. 2013a) was compared with owners' and professionals' viewpoints about peer learning and promotion of it (Hamunen et al. 2013b).

3 Results

3.1 Definition of genuine peer learning

In Table 1, the end of the continuum, to which forest owners' genuine peer learning should be aimed, is emphasised (Hamunen et al. 2013a). According to the emphasised peer learning dimensions, the highest motivation for learning should come from forest owners themselves. Initiation and reinforcement can also be received from external sources, such as society or extension organisations, but it should not be too voluminous. High levels of external support may easily lead to advocacy or even commercial motivations. These commercial motivations can aim to support the objectives of the external party, not learning by forest owners.

The role of forest professionals needs be considered carefully. Their role should be restricted to facilitation, or professionals can act as invited specialists who provide information about certain topics, but not have the entire responsibility. Focus of forest owners' peer learning should be open or at least adaptive rather than predefined. If the profiles are predefined, there is a risk that only a narrow group of owners, who already have strong opinions about the issue of interest, participate. Moreover, strictly defined focus can already include an ideology, which can even prevent learning of different perspectives. In genuine peer learning, the schedule is open and in that sense it differs, for example, from a project that has predefined starting and ending points. The roles of participants are shared and changing which prevents one person from taking a too strong or permanent role.

Table 1: The characteristics of forest-owner-related peer learning are described with eight dimensions that vary between the two extremes. The preferred end of the extreme of genuine peer learning is highlighted with grey background

Dimensions	Extremes		
Initiation	internal		external
Reinforcement	low	medium	high
Content profile	open	adaptive	pre-defined
Participant profile	open	adaptive	pre-defined
Schedule	open		pre-defined
Role of professionals	no role	facilitator	specialist
Responsibility	shared		dedicated
Role continuity	changing		fixed

3.2 Forest owners' communication settings

Based on the focus group interviews, eight settings in which the owners communicate with each other were found (Table 2; Hamunen et al. 2013b). The settings found can be divided into those that are arranged by the forest extension organisations, by the forest owners themselves, and those that are informal and unorganised. The role of extension professionals from governmental organisations is strong. They have the responsibility and they act in the role of leader or teacher in forest days, courses and in projects. The informal networks, such as neighbourhood networks in the countryside or intergenerational networks within families, are dependent on owners own activity. However, according to the results they may be decreasing. On the other hand, networks developed via the Internet are supposed to increase.

The most promising examples of peer learning are the kind of events where forest owners have initiated the formal groups by themselves. Forest owner clubs in Finland have many features of genuine peer learning. Nevertheless, since the role of the Forestry Centre or other professionals is strong in some clubs, hidden advocacy motivations may exist. The disadvantages of the prevailing practice of forest owner clubs are the stable role of participants and a homogenous composition of the group.

Table 2: Eight forest owners' communications settings in Finland

Settings led by extension organisations
Forest days
Courses
Projects
Settings led by forest owners
Board of directors of local FMA
Forest owner clubs
Informal and unorganised settings
Neighbourhood network in the countryside
Families
Discussion forums on Internet

3.3 Controversial issues when promoting peer learning

In the focus group interviews, especially professionals and experienced owners noted that not all forest owners are peers with each other. Inexperienced owners considered that they have little to offer others and experienced owners failed to put themselves on the same level as inexperienced individuals. Therefore, it was suggested that *peer learning groups should be homogenous* enough in a way that owners have approximately similar levels of experience as a forest owner. This would secure that everybody understands the topic of discussion and provides a safe atmosphere where owners dare to speak and ask questions. Also, if participants are on the same level, it might enable sharing and changing of roles which supports the idea of genuine peer learning (Table 1). On the other hand, gathering only with similar owners narrows the participant profile (Table 1) and may restrict the diffusion of information.

In a case of inexperienced owners as members of peer learning groups, professionals were afraid of the delivery of wrong information. More experienced owners might pass on their obscure views as truths that the less experienced might take for granted. Therefore, some of the professionals were even unwilling to give up the responsibility of guiding the forest owner groups. *Guidance or even control of possible communities by professionals was seen as even necessary.* Wrong information and lack of control seems to be an actual issue especially in the discussion forums on the Internet. In addition, it was noted that, especially among non-residential owners, there is an evident need to introduce owners to each other and professionals are needed for this. However, control of the groups by professionals is against the idea of genuine peer learning (Table 1).

Professionals thought that the *topics of the communities should be predefined* or otherwise the discussion can easily stray into non-relevant issues. Having the predefined topics would also ensure that those truly interested in the specified topic or those sharing the same problem would participate in the same peer learning group. On the other hand, having a too predefined focus can even prevent genuine learning, since peer learning should be open to all kinds of thoughts (Table 1).

4 Recommendations for increasing peer learning

In earlier studies, forest owners' peer learning has mainly been seen only as a positive direction (Ma et al. 2012; Kueper et al. 2013). In this study, some challenges of peer learning were also noted. The comparison of the peer learning definition (Hamunen et al. 2013a) and the opinions of forest owners and professionals (Hamunen et al. 2013b) suggest that part of the issues are controversial when enhancing peer learning. According to previous research, a strong, committed leader for peer learning is needed, but the role of professionals or semi-professionals could be restricted to facilitation (Kueper et al. 2013). The results of this study suggest that professionals are needed especially at the beginning of peer learning to initiate the groups. However, when aiming for genuine peer learning, practices could be planned in a way that the responsibilities will finally be passed on to the forest owners themselves. In practice, promotion of peer learning could be started by adding peer learning elements into existing extension practices. In the discussion forums, a registration requirement and use of social media in parallel with face-to-face meetings would improve the quality of discussion.

The new information, that typically flows through weak ties with heterogeneous others, will not be received if owners gather only into homogeneous groups (Granowetter 1973). Therefore, according to this study, peer groups should be homogeneous enough to provide a safe atmosphere, but also heterogeneous enough in order to also gather information from external sources. Moreover, the interviewees suggested that, in some cases, instead of gathering together as a group, peer learning could also include one-to-one connections. Communication with a more experienced "mentor owner" would make it easier for an inexperienced owner to receive information and experiences. The informal nature of one-to-one discussions probably also dispels inexperienced owners' fears of making a fool of themselves by losing their faces via too simple questions, compared to a group setting.

The focus of peer networks needs careful considerations. As noted earlier, peer learning groups could focus especially on practical issues rather than on technical information (Kueper et al. 2013). Too strong of a focus may even prevent some owners from participating, if the ideological background behind the focus is strong. In addition, it is important to note that timber production is not the first objective of all forest owners and passivity or indifferent behaviour of forest owners might be partly derived from a fact that all forest owners cannot find silvicultural options that would be compatible with their values (e.g. Ní Dhubháin et al. 2007). Therefore, there should be diverse focuses in peer learning groups.

When promoting peer learning, the most demanding task, both for extension professionals as well as for forest owners, would be accustoming away from the conventional model of knowledge-transfer. An earlier study suggests that peer learning should not include only information delivery or intend learning, but focus rather on mutual communication in a relaxed and informal community (Kueper et al. 2013). At the moment in Finland, it seems that owners participate in the extension events to learn exact information and to get direct benefits. The desire of explicit technical learning is presumably a reflection of the prevailing expertise-oriented culture of forest extension in Finland. Meanwhile, the social aspects of communication between owners are framed by caution and reservations: most of the forest related face-to-face discussions are polite and careful and owners hesitate to share the most sensitive issues, such as money or protection, with other owners. In peer learning events, it is a challenge to create the kind of atmosphere that encourages open discussion about experiences and thoughts.

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[AS3-1]

Ownership Values of Small Forest Landowners in Northwest Washington, USA

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1 Introduction

Washington State, which is located in the northwest corner of the continental United States, is more than half forested, with a mix of public and private ownership. Of the privately-owned forests, approximately half are owned by small forest landowners (Rogers and Cooke 2009). These small-scale forests are particularly important to society because of their location adjacent to population centers as well as low-elevation streams and rivers that contain prime habitat for endangered salmon species.

Understanding the values, interests, and demographics of small forest landowners is essential for a successful extension forestry education and outreach program. We conducted a survey of small forest landowners in Snohomish and Skagit Counties to guide the development of an Extension forestry program to serve those counties. Both counties are located in the northwestern part of the state. Snohomish County is the county immediately to the north of Seattle and covers the northern part of the Greater Seattle Metropolitan Area. It is the third largest county in Washington by population and has experienced rapid growth and urbanization. Skagit County is adjacent to Snohomish County to the north. It is less populated and more rural, with a strong agricultural base. Both counties extend from the eastern shore of Puget Sound to the crest of the Cascade Mountains. In Snohomish County, 22,783 small forest landowners (the highest number in the state) own a total of 91,890 hectares of forest. In contrast, Skagit County has 6,200 small forest landowners who own a total of 48,581 hectares of forest (Rogers and Cooke 2009). The small forest ownerships in Snohomish County are highly fragmented, with owners having an average of 4 hectares of forest. The ownerships are less fragmented in Skagit County, where owners have on average 7.8 hectares of forest.

2 Methods

We conducted a mail survey in fall 2007 of small forest landowners in each county. Contact information was obtained from the County Assessor’s office in each county. We identified forest owners as those who were enrolled in a current use tax (CUT) program and/or paid the Forest Patrol Tax (FPT). CUT programs allow landowners to pay property taxes based on an assessed land use value for forestry use rather than the higher value based on an assessment of “highest and best use.” Enrolled landowners must have at least two

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forested hectares that are used for the growth and harvest of timber, and a forest management plan may be required. The FPT is assessed by the Washington Department of Natural Resources to cover the costs of wildland firefighting on private forestland. Those enrolled in a CUT program may also pay the FPT, but there are many landowners who pay the FPT who are not enrolled in a CUT program. Surveying landowners who paid the FPT was an important component of this study because it reached landowners who were not enrolled in CUT. Some past studies in Washington (e.g. Blatner et al. 2002, Johnson et al. 1999) only used CUT records to identify forest owners and thus may have missed an important part of the forest owner population in this area. In addition to contact information obtained from county tax records, we also obtained contact information for local members of the Washington Farm Forestry Association (WFFA), which is an association of small forest landowners in Washington.

From the list of landowners enrolled in CUT programs, we removed any duplicates (i.e. owners who were listed more than once due to owning more than one parcel), any non-individual or non-family owners (e.g. logging or mining companies, associations, etc.), and anyone who did not live within Snohomish, Skagit, or one of the immediate adjacent counties (i.e. those who were unlikely to attend a locally-based Extension class). This yielded a list of 984 landowners, for which we did a 100% sample. There were over 20,000[1] landowners on our initial list of those who paid the FPT and who owned at least two hectares, so we drew a random sample (approximately 15%). As with the CUT list, we removed any duplicates, including those who were already part of the CUT sample, any non-individual or non-family owners, and anyone not living in the immediate vicinity. This yielded a total FPT sample of 1,902 landowners. The WFFA contact list included 128 landowners, for which we did a 100% sample (removing any resulting duplicates in the CUT or FPT lists).

From the original sample of 3,014 landowners, there were 99 surveys that were undeliverable due to invalid addresses, yielding 2,915 recipients with valid addresses. We received 1,053 responses, though 29 of those were unusable (e.g. refusals), for a total of 1,024 usable responses (35% of valid addresses). These figures are summarized in Table 1.

Table 1: Sample sizes and responses by county and landowner type.

	Original Sample	Valid Addresses	Total Responses	Usable Responses	Percent Usable Responses
Snohomish CUT	513	492	186	183	37%
Snohomish FPT	1046	984	312	301	31%
Snohomish Total	1559	1476	498	484	33%
Skagit CUT	471	467	205	201	43%
Skagit FPT	856	845	271	263	31%
Skagit Total	1327	1312	476	464	35%
Combined CUT	984	959	391	384	40%
Combined FPT	1902	1829	583	564	31%
WFFA	128	127	79	76	60%
Combined Total	3014	2915	1053	1024	35%

[1] This is not an accurate estimate of the total survey population, as duplicates et al. were only removed from the sample, not the whole list.

The two-page survey asked participants to rank 11 different forest ownership values on a five-point Likert scale where 5 = very important and 1 = very unimportant. Demographic data was also collected, including age, education, property size, and length of ownership. In conducting the survey, we generally tried to follow the recommendations of Dillman (2007). The surveys were mailed with a cover letter explaining the study and a postage-paid return envelope. Approximately two weeks after mailing the first survey, a reminder letter was sent. Approximately two weeks after that, a second reminder was sent along with another copy of the survey.

3 Results

3.1 Demographics

Respondents tended to be older, with 76% over age 50 and 20% older than age 70. Less than 1% were younger than 30 (Figure 1). Respondents were well-educated, with 79% having pursued higher education (Figure 2). Property size was divided fairly evenly between <8 hectares and ≥8 hectares (Figure 3). Most respondents had owned their property for more than 10 years (Figure 4).

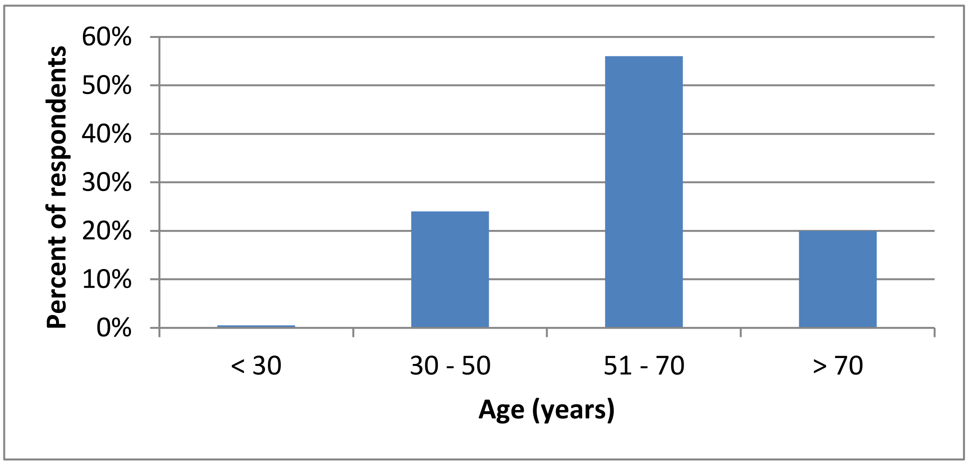

Figure 1: Age distribution of respondents.

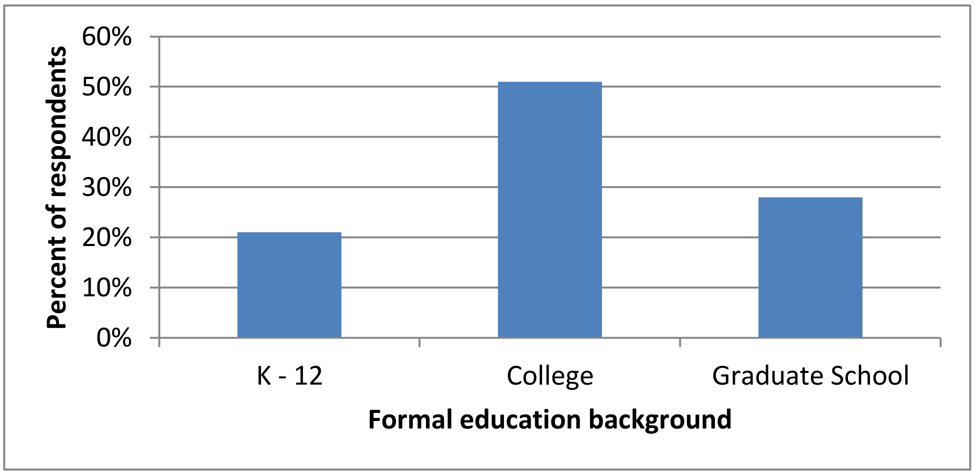

Figure 2: Formal education of respondents.

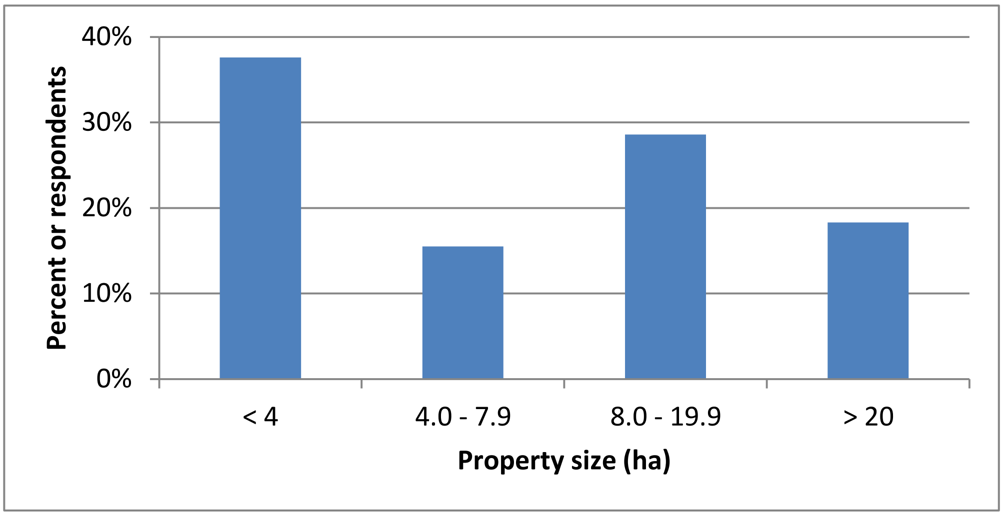

Figure 3: Property size distribution of respondents.

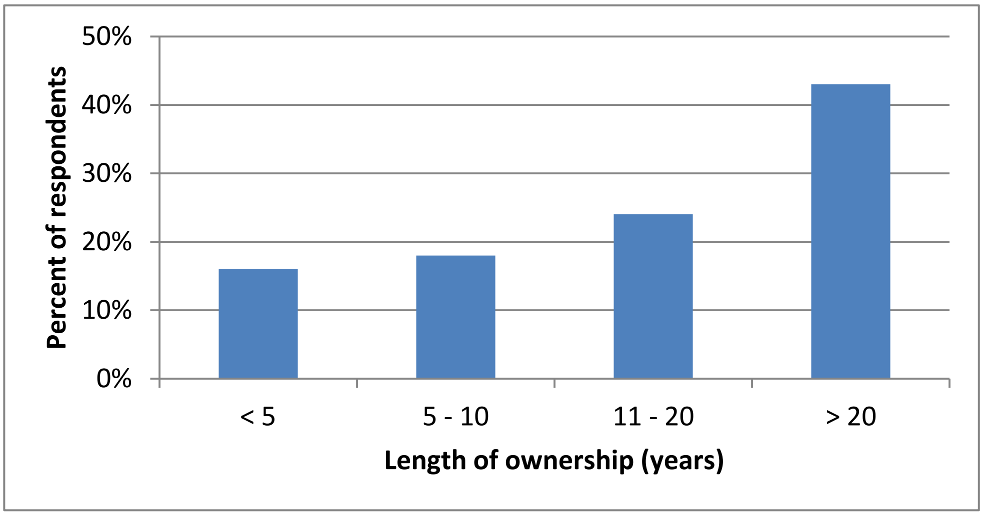

Figure 4: Length of ownership distribution of respondents.

We were particularly interested in differences between owners of small properties (< 8 ha) and those with large properties (8 or more ha). We used t-tests ($\alpha = 0.05$) to compare demographics between those two groups. Respondents with large properties were older, had owned their land longer, and were more highly educated than those with small properties (Table 2).

Table 2: Demographic comparison between owners of small and large properties.

	Owns < 8 ha			Owns ≥ 8 ha				
Variable	Mean**	SD	n	Mean**	SD	n	t	P-Value
Age sample	2.84	0.67	503	3.04	0.67	443	-4.60	0.001*
Education	1.99	0.70	362	2.13	0.69	334	-2.67	0.01*
Length of ownership	2.73	1.13	496	3.10	1.08	445	-5.22	0.001*

* Significant at $\alpha = 0.05$

** Means are based on an ordinal ranking of categories

3.2 Ownership values

Over 75% of respondents ranked the following ownership values as somewhat or very important: privacy/rural lifestyle (85%); aesthetic enjoyment (84%); maintaining a healthy ecosystem (82%); a place for wildlife (82%), personal residence (79%); personal attachment to the land (76%) and satisfaction from owning land (75%). Fewer respondents ranked the following ownership values as somewhat or very important: a sound financial investment (67%); personal recreation (64%); family legacy (56%), and income from timber harvest (28%). A summary of responses is presented in Table 3.

Table 3: Mean ownership values on a scale of 1 (very unimportant) to 5 (very important).

Ownership Value	Mean	SD	n
Privacy/rural lifestyle	4.37	1.05	1,001
Aesthetic enjoyment	4.33	0.97	993
Maintaining a healthy ecosystem	4.29	1.01	1,002
A place for wildlife	4.26	0.99	1,006
Personal residence	4.21	1.31	997
Personal attachment to the land	4.15	1.07	1,006
Satisfaction from owning land	4.11	1.08	998
A sound financial investment	3.88	1.23	1,004
Personal recreation	3.76	1.18	998
Family legacy	3.56	1.39	1,002
Income from timber harvest	2.49	1.41	994

As with the demographics, we used t-tests ($\alpha = 0.10$) to compare ownership values between those with small properties (<8 ha) and those with large properties (≥8 ha). The ownership values Personal residence, Aesthetic enjoyment, Privacy/Rural lifestyle, and A place for wildlife, were ranked as more important to landowners with small properties. Income from timber harvest and family legacy were more important to landowners with large properties. There was no significant difference in ranking between owners of small and large properties for maintaining a healthy ecosystem, a sound financial investment, personal recreation, personal attachment to the land, or satisfaction from owning land (Table 4).

Significant differences ($\alpha = 0.10$) were detected between the two counties for several of the ownership values. This may have been due to the larger average parcel size of respondents in Skagit County (15.4 ha) versus Snohomish County (13.0 ha). We tested again, controlling for size, and found that for landowners with 20 or more hectares, personal residence, privacy/rural lifestyle, and personal recreation, were ranked higher in Skagit County, while family legacy was ranked higher in Snohomish County. For landowners with 8.0 – 19.9 hectares, personal residence and privacy/rural lifestyle were ranked higher in Skagit County. For landowners with 4.0 – 7.9 hectares, income from timber harvest was ranked higher in Snohomish County. For landowners with 2.0 – 3.9 hectares, a place for wildlife was ranked higher in Skagit County.

Table 4: Comparison of ownership values between owners of small and large properties.

	Owns < 8 ha			Owns ≥ 8 ha				
Variable	Mean	SD	n	Mean	SD	n	t	P-Value
Privacy/Rural lifestyle	4.58	0.87	494	4.17	1.15	436	6.06	0.001*
Aesthetic enjoyment	4.40	0.92	485	4.24	1.01	439	2.54	0.01*
Maintaining a healthy ecosystem	4.32	0.99	495	4.25	1.03	438	0.99	0.32
A place for wildlife	4.32	0.95	494	4.20	1.03	441	1.81	0.07
Personal residence	4.55	0.95	495	3.85	1.56	432	8.24	0.001*
Personal attachment to the land	4.12	1.09	495	4.16	1.05	441	-0.63	0.53
Satisfaction from owning land	4.13	1.07	489	4.08	1.09	439	0.81	0.42
A sound financial investment	3.91	1.26	495	3.85	1.19	439	0.66	0.51
Personal recreation	3.80	1.14	489	3.76	1.21	440	0.52	0.60
Family legacy	3.44	1.41	491	3.66	1.39	441	-2.40	0.02*
Income from timber harvest	2.02	1.24	486	3.00	1.43	439	-11.15	0.001*

* Significant at $\alpha = 0.10$

We also used t-tests compare ownership values between absentee and resident owners. Because we did not ask directly on the survey whether a landowner was a resident or absentee owner, we used the ranking of the personal residence value as a surrogate. Respondents who ranked this as somewhat or very important were assumed to live on their property, while those who ranked the value lower were assumed to be absentee. We found significant differences ($\alpha = 0.01$) for all values except family legacy, with absentee landowners ranking income from timber harvest higher and the rest of the values lower compared to resident landowners (Table 5).

Table 5: Comparison of ownership values between absentee and resident landowners.

	Absentee			Resident				
Variable	Mean	SD	n	Mean	SD	n	t	P-Value
Privacy/Rural lifestyle	3.22	1.40	209	4.69	0.63	777	-22.31	0.001*
Aesthetic enjoyment	3.75	1.22	209	4.49	0.86	767	-10.34	0.001*
Maintaining a healthy ecosystem	3.93	1.20	209	4.39	0.92	776	-6.05	0.001*
A place for wildlife	3.90	1.21	210	4.36	0.90	776	-6.18	0.001*
Personal attachment to the land	3.72	1.20	208	4.27	1.00	779	-6.81	0.001*
Satisfaction from owning land	3.70	1.26	207	4.22	1.00	773	-6.22	0.001*
A sound financial investment	3.60	1.31	209	3.95	1.20	777	-3.72	0.001*
Personal recreation	3.39	1.29	209	3.88	1.13	775	-5.43	0.001*
Family legacy	3.48	1.30	210	3.58	1.42	773	-0.97	0.34
Income from timber harvest	3.12	1.52	207	2.31	1.33	772	7.52	0.001*

* Significant at $\alpha = 0.01$

4 Discussion and conclusions

This study found that small forest landowners in Snohomish and Skagit County Washington tend to be older, be highly educated, and have owned their property for many years. This is consistent with current national trends in the United States (Butler 2008). The length of ownership figures suggest that there has not been heavy turnover of forest owners in this area in recent decades. However, the majority of forest owners being near or beyond retirement age suggests that a generational transition is pending such there may begin to be heavy turnover in the coming decades as land is passed down or sold. Interestingly, our results suggest that passing land specifically to family heirs may not be a high priority for many landowners in our study, as family legacy was the second lowest-ranked value. This differs from the results of some other studies (e.g. Butler et al. 2007, Johnson et al. 1998). Nonetheless, there are important opportunities for Extension to help prepare current and future owners for whatever transitions occur, and there is a need for education programs that appeal to a multi-generational audience.

Respondents identified a combination of multiple ownership values as being important to them. The top-ranked values were non-market values that included privacy/rural lifestyle, aesthetic enjoyment, maintaining a healthy ecosystem, and a place for wildlife. While there were differences detected between owners of large vs. small properties, these values were ranked highly across both groups. Income from timber harvest was the lowest-ranked value by a wide margin. It also had the highest standard deviation, suggesting that this was a more polarizing value that owners felt strongly about one way or the other. Personal residence and family legacy also had relatively high standard deviations relative to the other values. This is to be expected, as these values will be either very important or very unimportant depending on whether a landowner lives on the property or has children.

We detected significant differences between Snohomish and Skagit County in the mean ranking for some values. We postulated that this may be because the average ownership size was larger in Skagit County. However, when we controlled for size, we still detected a variety of differences for some values. While this study is not sufficient to draw conclusions about ownership values relative to the characteristics of a particular county, the differences we found illustrate the importance of considering local differences and nuances when planning an Extension program and not relying solely on broader state and national trends.

Some of the biggest differences we found were between absentee and resident landowners, with all values ranked significantly higher for resident landowners except for timber income, which was ranked significantly lower, and family legacy, for which there was no significant difference. These results were not surprising to us, as we would expect that forest ownership values would be more strongly felt for people who live on their property and for whom the forest is part of their home. We were also not surprised that timber income was a higher priority for absentee owners. Features that make a property more likely to have an absentee owner, such as large size or remote location, are also more conducive to timber production. Furthermore, a piece of property that is owned separately from one's home may be more likely to be considered a financial asset with an expectation of income generation. Nonetheless, although timber income was ranked higher for absentee owners, it was still the lowest-ranked value even for this group.

Given that most ownership values were ranked significantly lower by absentee owners, it may be more challenging for Extension to engage this group, which accounts for approximately 27% of the forest owners and 42% of the forest area[1] represented in this study. It is important to note that this study only looked at local absentee owners who live reasonably close to their land. Our study did not include those who own property in Snohomish or Skagit County but who live out of the area. Out-of-area absentee landowners may be an important audience for Extension, and with the growing capacity to provide Extension programs online, it is now easier than ever to reach this audience.

The finding of multiple ownership values, a high overall importance of non-market and ecosystem values, and a low overall importance of timber income is consistent with other studies in Washington and other states (e.g. Butler 2008, Creighton et al. 2002, Hull et al. 2004, Johnson et al. 1999, Jones et al. 1995). This has implications relative to landowner incentive programs as it suggests that education and technical assistance to help landowners achieve their ecosystem objectives may provide a greater incentive for good forest stewardship than financial assistance. This is consistent with the findings of Kilgore et al. (2007).

Our finding that timber income was considered far less important on average than other values across all groups does not mean that timber management should not be a part of an Extension education program. Owners for whom timber income was important tended to own larger properties, so while only 28% of owners ranked timber income as important, they account for 54% of the land area represented. Thus, timber management is still a significant activity in these counties. Also, landowners who did not rank timber income as important may still harvest timber at some point to meet a sudden need for income due to a life event such as major medical bills, college expenses, or retirement. Since this will be an infrequent and unfamiliar event with long-lasting consequences, it is important for good educational resources to be available.

The relatively low interest in timber harvest income among the majority of landowners still raises an important question, though, of whether Extension programs should be designed to assist the highest number of owners or the highest number of acres. Tight budgets and scarce program resources usually demand some level of prioritization. The state and local governments providing the funding for Extension may be more interested in the number of hectares served. Landowners, however, may prefer to see more people served. A survey of Washington landowners by Blatner et al. (1991), for example, found that 47% believe government programs should assist the greatest number of owners, while 14% thought programs should assist the greatest number of hectares, and 39% were not sure. Other authors have noted that there is a cost to ignoring the growing number of forest landowners who own very small properties, as maintaining public support for forestry outreach programs requires appealing to a broad base of people (DeCoster 1998, Hull et al. 2004). Appealing to the ecosystem and lifestyle values that are highly-ranked across multiple landowner groups may be a good way for Extension programs to engage a broad base of landowners without neglecting key groups.

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[AS3-2]

How accurate are non-industrial private forest (NIPF) owner typologies?

Andrej Ficko[1] and Andrej Bončina[2]

1 Introduction

Non-industrial private forest (NIPF) owner typologies have been frequently used for describing the diversity of forest owners. The choice of appropriate approach and the statistical method best suited to the type of research question is crucial for ensuring the validity of the typology. Typology developers have typically made the assumption that respondents know the answers to the questions and that their responses are an accurate reflection of their opinions. However, since the segmentation has almost exclusively been based on self-reported statements (e.g. Likert scale items in a survey), analysts should be aware that respondents may provide a somewhat biased view of reality. This introduces some uncertainty in the interpretation of responses and raises questions about the accuracy and validity of the typology.

The second source of uncertainty that should be taken into account in forest owner segmentation is the uncertainty about how the final segmentation of owners into the number of disjoint sets corresponds to the real number of customer segments. The issues related to this concern also include uncertainty about the number of customer segments, their meaning, and the fuzziness of the membership. More discussion on this is in Ficko and Boncina (2013a; 2013b).

Some typology developers have already discussed the issues of accuracy, reliability and validity of research conclusions. Bliss and Martin's (1989) typology is one the first to discuss the advantages and disadvantages of qualitative and quantitative approaches to NIPF owner segmentation. Egan and Jones (1993, 1995) raised the question of the discrepancy between management practices and stated views about forest stewardship. They concluded that survey responses could not always be reliable indicators of how lands are managed. Selter et al. (2009) compared a multiple criteria-derived typology produced by cluster analysis with more traditional stratification of private forest owners based on single criteria and concluded that multivariate statistical methods outperform single criteria methods. Hujala et al. (2012) cross-tabulated two NIPF owner typologies: a typology based on ownership objectives developed by a quantitative approach with a typology of decision-making styles where the queries regarding decision making styles originated from a mixed-method study. Meilby and Boon (2004) studied the sensitivity of a forest owner typology to the choice of statistical model. Despite the fact that the scientific audience is aware of threats to validity, we believe that the validity of NIPF owner typologies has still not been given enough attention.

The aims of this paper are thus: (1) to analyze how did typology developers account for critical

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uncertainties in developing typologies; 2) to analyze the strengths, weaknesses, opportunities and threats for two major approaches being used in forest owner segmentation; (3) to demonstrate the possible effect of biased responding on segmentation results; and (4) to discuss how pitfalls likely to be encountered to in private forest owner segmentation can be avoided.

2 Methods

2.1 A review of methods used in NIPF owner typology development

We reviewed research papers on NIPF owner typologies published in peer-reviewed journals indexed by the Science Citation Index Expanded (SCI-EXPANDED) from 1970 to 2012. After reading the methods section of each typology paper carefully, a classification of research approaches into quantitative, qualitative or mixed-method approaches was done. For quantitative typologies, we analyzed whether and how respondent uncertainty was considered. Typologies developed by quantitative methods were further classified into two groups, i.e. Frequentist and probabilistic typologies, according to the approach to uncertainty evaluation (Ghazoul and McAllister, 2003).

2.2 SWOT analysis of approaches to NIPF owner segmentation

We analyzed the strengths, weaknesses, opportunities and threats (SWOT analysis) of the Frequentist and the Bayesian approach to NIPF owner segmentation. Since Ficko and Boncina (2013a) is the only example of a probabilistic typology discussing the pros and cons of probabilistic clustering, we refer to that study as an example of the Bayesian approach. Ficko and Boncina (2013a) clustered forest owners (N= 380) according to their decision making type with the expectation maximization clustering (EM) algorithm. The information on decision making was collected by face-to-face interviews in which respondents were asked to rate the relevance of 19 factors for decision making with an equidistant five-point ordinal Likert scale (1 being not at all important, 5 being very important).

2.3 The effect of biased responding on segmentation results

We illustrated the effect of biased responding on the validity of results. Biased responding was simulated by three non-linear transformations of the original values for the 19 factors assigned by the respondents (x). We used logarithmic (LN), exponential (EXP) and step-wise transformation (SW)) to simulate the three most common response styles (Table 1). In addition, to simulate the likely multitude of response styles in a sample, we randomly assigned one of the three transformations to the respondents, resulting in a mixture of differently biased responses (MIX).

Table 1: Transformations of the original Likert scale to simulate biased responding

Transformation	Respondent's interpretation of the Likert scale	Respondent's attitude to risk, response style	Bias
Linear (no transformation, LIN)	The distance between each successive Likert scale category is equidistant: $LIN = x$	Risk-neutral	No bias, no uncertainty (or ignored)
Logarithmic (LOG)	Each successive Likert scale category is progressively underestimated: $LOG = \ln(x)$, where x is original Likert scale value.	Risk averse, DARS*	Bias towards lower response categories, respondent rather conservative in assigning high relevance
Step-wise (SW)	Avoidance of extreme response categories: $SW = \begin{cases} 1; & x = 4 \quad or \quad x = 5 \\ 0.5; & x = 3 \\ 0; & x = 2 \quad or \quad x = 1 \end{cases}$	Two-side constrained, MRS*	Central tendency bias, the "uninterested" respondent is avoiding extreme response categories (1 and 5).
Exponential (EXP)	Each successive Likert scale category is increasingly overestimated $EXP = e^x$	Risk-seeking, ARS*	Bias towards higher response categories (4 and 5).
Random (MIX)	Respondent behavior in real world: 1/4 LIN, 1/4 LOG, 1/4 SW, 1/4 EXP	Mixture of attitudes	Biased responding is stochastic

*DARS – disacquiescence response style or the tendency to disagree with the items irrespective of the content of the items, MRS - mid-point responding or the tendency to use the middle response category, ARS – acquiescence response style or consistent agreement with the items irrespective of their content.

After the transformations, we used score range procedure (Kangas et al., 2008)

$$V_{ij} = (c_{ij} - \min(c)) / (\max(c) - \min(c)) \qquad \text{Eq. (1)}$$

to scale all transformed values and the original Likert scale values to a range of 0-1, where V_{ij} is the scaled value of information of the j-th transformation at the i-th number of points, c_{ij} is the transformed value of j-th tranformation at the i-th number of points, and the min (c) and max (c) are the minimum and maximum of the respective transformed values. The highest values in new scales thus had a value of 1, the lowest value received a value of 0 and intermediate values followed an interval scale.

After the dimension reduction from 19 factors to 6 factors (by the PCA), six transformed and scaled variables were used as clustering variables. We then hierarchically clustered the NIPF owners to screen the clustering pattern. The possible number of clusters in the k-means clustering, which we continued with, was set at 5. We used Ward's minimum variance method and the squared Euclidian distance as a similarity distance measure.

Similarities between the original response–based clustering and the biased response–based clustering were analyzed by the contingency tables. Cramer's V was used as a pair counting measure of similarity. The amount of mutual information between the original response–based clustering and the biased response–based clustering was measured with the Asymmetric Uncertainty Coefficient (Pfitzner et al., 2009). The coefficient measures in a range from 0 to 1 how much knowing the biased response–based clustering reduces the uncertainty about the clusters that would be obtained if the responses were unbiased.

3 Results

3.1 Quantitative methods used for NIPF owner segmentation

Since Kurtz and Lewis's (1981) typology of NIPF owners in the Ozark Mountains of Missouri based on motivations and objectives for holding forest land, more than 40 typologies have been published in peer-reviewed journals. Most of them used a quantitative approach to data collection and analysis (N= 29).

An important milestone was the study of Kuuluvainen et al. (1996), which pioneered market segmentation techniques in private forest owner research. However, only 20% of typology developers accounted for the fact that respondents might be uncertain about their answers. Most frequently, they manipulated the "I don't know" category (Fig. 1), either by adding this category to the Likert scale, excluding it from processing or recoding it into mean values. However, none of the studies acknowledged that respondents may provide biased responses due to reasons other than uncertainty. Ficko and Boncina (2013b) have recently showed a common source of bias that may threaten the validity of a typology. They demonstrated how to detect and correct for response style bias in an NIPF owner segmentation study.

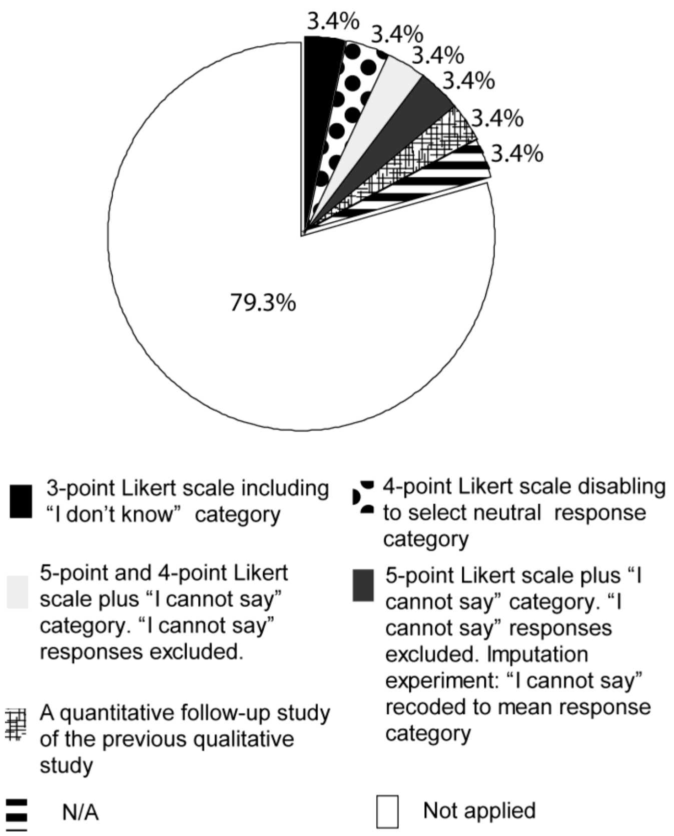

Figure 1: Methods for accounting for respondent uncertainty in survey-based typologies, 1970 - 2012

3.2 SWOT analysis of Frequentist vs. Bayesian approach-based segmentation

Analyst uncertainty in cluster analysis can be communicated either by using the Frequentist approach or the probabilistic Bayesian approach. In the context of forest owner segmentation, using the former approach means that the uncertainty about forest owner types is expressed as the chance that those types occur if the hypothesis of non-homogeneity of private forest owners is assumed to be true and if the segmentation is repeated indefinitely. The Bayesian approach is different. It allows an analyst to estimate the strength of belief (in a form of probability between 0 and 1) for the same hypothesis. A more detailed comparison of both approaches is presented in Table 2.

Table 2: SWOT analysis of the Frequentist and the probabilistic approach to NIPF owner segmentation

	Frequentist approach (e.g. k-means clustering)	**Probabilistic approach (e.g. expectation maximization clustering)**
Strengths		
What are the advantages?	Well-established methods that most researchers are familiar with. Confidence intervals and p-values used for communicating uncertainty	Advanced methods, membership is given with probabilities. Individual forest owner behavior is not methodologically simplified into just one most characteristic mode. Strength of belief or weight of evidence used for communicating uncertainty
Core competencies	Hypothesis testing, censuses	Includes and builds upon existing knowledge on forest owner types
Where most efficient?	Segmentation with a priori specified number of segments	When previous information on the number and structure of segments is to be updated.
Problems particularly suitable to solve	Identifying a set of most separated customer segments of approx. the same size	Quantitative identification of well separated customer segments when the observations follow a mixture of multivariate normal distributions
Weaknesses		
Type of problems that cannot be handled?	Each private forest owner could only be assigned to one cluster, the clusters are expected to be of similar size	The number of probabilities for each forest owner is equal to the number of components in the mixture, which is not practical when large numbers of clusters are expected in the population
Requirements for resources (e.g. software)?	Most statistical packages include statistical testing and non-probabilistic clustering algorithms	Advanced methods, not available in common statistical packages such as SPSS

What can easily be mishandled or done poorly?	Setting an inappropriate number of clusters (k) before starting the analysis, classification of owners with fuzzy attitudes	Operating with non-normally distributed data, poor rate of convergence in not well-separated mixtures, employing the EM algorithm for a model having a certain number of components when there are actually fewer groups
What needs improvement?	Uncertainty about whether the multi-objective forest owners truly represent a separate group or are just a methodological artifact	More examples of better performance in comparison to the Frequentist approach, examples of good practices are still scarce
Opportunities		
Does it meet trends in sciences?	Well-established methods	A forest owner could be production-oriented, protection-oriented, or multi-objective at the same time. Multi-objectiveness of private forest owners represented with probabilities [0-1] of membership to segments 1...n
Niches that competitive methods are missing?	The number of customer segments can be more controlled (e.g. expertly defined)	The multi-objectiveness is not methodologically distorted, generalized EM clustering can handle categorical variables, log-normal and Poisson distributed data
New technologies	E.g. fuzzy k-means	Probabilistic methods are quickly developing, e.g. Bayesian structural equation modeling
New needs of typology users	No opportunities	A more extensive implementation of the Bayesian approach in studying private forest owner behavior could facilitate meta analyses of typologies and cross-national evaluation studies
Threats		
The obstacles to overcome	Meta analysis of typologies from different countries is difficult	Distrust in quantitative methods
Competitive methods	Qualitative, mixed methods	Qualitative, mixed methods
Negative environment	Favoring qualitative approach	Favoring qualitative approach, aversion to quantitative methods in social research

Out of 29 quantitatively-derived typologies, only two were developed with the probabilistic approach; Boon and Meilby's (2007) typology of forest management attitudes and practices which uses latent class analysis (though no probabilities for cluster membership are reported), and the typology of management decision making in private forest properties by Ficko and Boncina (2013a), where expectation maximization clustering was employed.

3.3 Possible effect of biased responding on segmentation results

Any biased respondent's interpretation of the equidistant Likert scale resulted in significantly different cluster membership assignment (Table 3). Cramer's V between the original response–based clustering and the biased response–based clustering ranged from 0.405 for EXP to 0.605 for LOG, indicating that risk–seeking behavior may generate the most extreme deviation from the original response–based clustering. By calculating the normalized mutual information (NMI) for pairs of clusterings, we found that if strong bias in the responses truly existed, treating the responses as unbiased would only reduce 21.9% to 37.6% of the uncertainty about the true clusters in the case of risk–seekers and risk avoiders, respectively. If our surveyed population represented a mixture of risk–attitudes, interpreting the biased response–based clustering as unbiased only reduced the error in predicting the true (i.e. unbiased response–based) clusters by 33%.

Table 3: Similarities in the classification of NIPF owners (N=364) using unbiased responses (LIN) and biased responses (LOG, SW, EXP, MIX). In (%) of owners. * denotes approx. significance at p < 0.001.

A) k-means clustering							Pair counting measure of similarity	Information theoretic measure of similarity
		LIN						
	Cl.	1	2	3	4	5		
		17.3	17.0	4.1	29.1	32.4	Cramer's V	Asymmetric NMI
LOG	1	12.4	0.5	0.0	0.0	8.2	0.605*	0.376*
	2	3.0	3.8	1.1	5.5	1.9		
	3	0.0	0.0	1.9	0.0	0.3		
	4	1.9	1.4	1.1	23.6	22		
	5	0.0	11.3	0.0	0.0	0.0		
SW	1	7.7	0.8	0.0	0.0	7.4	0.452*	0.269*
	2	3.8	4.9	1.4	6.6	4.9		
	3	3.6	0.8	1.4	2.2	0.8		
	4	1.6	0,3	1.1	19.2	19.2		
	5	0.5	10.2	0.3	1.1	0.0		
EXP	1	9.6	1.6	2.2	4.4	4.7	0.405*	0.219*
	2	1.1	10.7	0.0	3.8	2.5		
	3	1.6	3.3	1.9	1.4	8.8		
	4	0.0	1.4	0.0	10.2	2.5		
	5	4.9	0.0	0.0	9.3	14.0		
MIX	1	0.8	12.6	0.0	0.8	0.0	0.524*	0.330*
	2	10.4	0.3	0.0	0.8	8.8		
	3	1.6	0.8	2.2	0.0	3.0		
	4	3.0	2.5	1.4	8.5	2.5		
	5	1.4	0.8	0.5	19.0	18.1		

4 Conclusions and recommendations

- In NIPF owner segmentation, quantitative survey-based studies prevail. As a rule, 'hard' rather than ’soft’ algorithms were used for clustering; forest owners were assigned to exactly one cluster and within that cluster, all were equals. Probabilistic methods for developing forest owner typologies are not yet extensively used in forest owner segmentation research, despite the fact that there are some obvious advantages.
- Self-reported respondent uncertainty has been accounted for in only 20% of typologies. However, none of the analysts considered latent drivers for bias (e.g. response style or socially desirable behavior). We showed by a simulation that any type of severely biased responding would result in significantly different cluster membership assignment. Hence, more attention should be given to methodological rigor (bias control, robustness of clustering methods, cross-validation of typology etc.), and advanced methods from social sciences should be used to ensure the validity of typologies (e.g. confirmatory factor analysis).
- Uncertainty persists about whether multi-objective forest owners truly represent a separate group of owners or are just a methodological artifact of k-means clustering. The establishment of disjoint forest owner types may be in contradiction to real attitudes, for a forest owner may have more than one significant management attitude or fall in between different attitudes. In probabilistic segmentation, multi-objective owners do not necessarily cluster into a separate group but are members of each group with certain probability.

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[AS3-3]

Public Opinion on Forestry and Forest Policy in Japan

Ryoko Ishizaki[1]

1 Introduction

Small-scale forestry in Japan has been largely supported by public forest policy; therefore, public perception of forestry and public preferences for policy are particularly important for its existence. Recent trends in Japanese forest policy are characterised by two aspects. The shift of policy focus from wood production to fulfilment of the environmental functions of forests is one aspect that would change the perception of forestry in public policy. Another aspect is implementing the idea of 'new public management' (NPM) and focusing on cost-efficiency for governments. This aspect has often stirred debates on the allocation of public investments between urban and rural areas. These trends could suggest that public support for forestry as an economic activity in rural areas is declining by the day. However, the nature of public opinion on forestry and forest policy has not yet been thoroughly investigated in Japan. There is a requirement to identify the aforementioned aspects from the data on public opinion.

This study seeks to determine the trends and nature of public opinion on forestry and forest policy in Japan. Since 1976, the Japanese Cabinet Office has conducted ten public opinion polls concerning forest issues. Using these data, the Japanese public's perceptions of forestry and forest policy are analysed. The analysis focuses on the differences in public opinion based on personal attributes such as sex, age, and area of residence. Moreover, the study examines the relationships among the answers to a number of different questions.

2 Materials and Methods

The data analysed in this study are the results from a series of surveys conducted every three or four years since 1976 by the Japanese Cabinet Office (Table 1). In all of these polls, the stratified random sampling method is used and the answers from samples are collected through face-to-face interviews with adults aged 20 or above. The data published by Cabinet Office are the results of simple tabulations and cross tabulations with attribute data or the answers to some other questions.

Each poll is composed of 12–21 questions. Not many of the same questions are asked on multiple surveys. The question 'preference of house construction methods' is the only common question asked on all ten polls in the same way. 'Reason for visiting forests' and 'Needs for forests services' are the questions asked on all ten polls, but the questions are worded differently and the listed choices differ sometimes as

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well. The differences in the main questions which are analysed in this study are shown in the right 4 columns of Table 1.

Table 1: Public opinion polls concerning forest issues conducted by the Cabinet Office

	Enquiry		Title of the Poll	Sample	Valid		Number of	Need for	Need for	Forest	Measures for
	Year	Month	"Opinion Poll on ..."	Size	Responses		Questions	Services	Measures	Improvement	Improvement
1	1976	9	Forests and Forestry	5,000	3,687	74%	20	△	△		
2	1980	7	Forests and Forestry	3,000	2,388	80%	21	○			
3	1986	8	Green and Trees	3,000	2,405	80%	14	○			
4	1989	10	Forests and Life	3,000	2,358	79%	16	○		○	
5	1993	1	Forests and Green	3,000	2,166	72%	12	○		○	
6	1996	1	Forests and Forestry	3,000	2,282	76%	17	○		○	
7	1999	7	Forests and Life	3,000	2,137	71%	17	◎	○	◎	
8	2003	12	Forests and Life	3,000	2,113	70%	20	◎	◎	◎	
9	2007	5	Forests and Life	3,000	1,827	61%	16	◎	◎	◎	◎
10	2011	12	Forests and Life	3,000	1,843	61%	15	◎	◎	◎	◎

Note: ◎means that there was the same question and the same number of listed choices on the poll in 2011. ○ means that there was the same question but with a different number of listed choices on the poll in 2011. △ means that there was a similar question on the poll in 2011.

3 Results: Public Perceptions on Forestry and Forest Policy

3.1 Needs for forests services

3.1.1 Trend

The results of the question on ‘Needs for forests services’ offer the basic public perceptions of the roles of forests, and its ranking order lists are often quoted in white papers by the Forestry Agency (ex. Forestry Agency, 2013). The respondents can select up to three services which they most expect forests to fulfil.

Environmental services, especially the services which are expected to prevent damage to life, were given the top priority as needed services. The highest-needed forest service on nearly all of the polls was ‘Prevention of disaster’, followed by ‘Conservation of water resources’ and “Prevention of global warming’, which was added from the poll in 1999.

The need for the ‘Production of wood’ has shifted most dramatically. On the 1980 poll, and also the poll from 1976, ‘Production of wood’ was the one of the services most prioritised by respondents. This need declined drastically in the 1980s and 1990s and then increased moderately in the 2000s.

The trend in the need for ‘Recreation and relaxation’ is possibly affected by the changes in the wording in the choices which are given to interviewees. Until the poll in 1999, the needs related to ‘Recreation and relaxation’ asked about the need for recreation, whereas on the 2003 poll, the question asked about the need for recreation and relaxation, and since 2007, the poll has only asked about the need for relaxation. Therefore, the noticeable increase in the need for ‘Recreation and relaxation’ from 2003 is considered to show that the need for relaxation is greater than is the need for recreation.

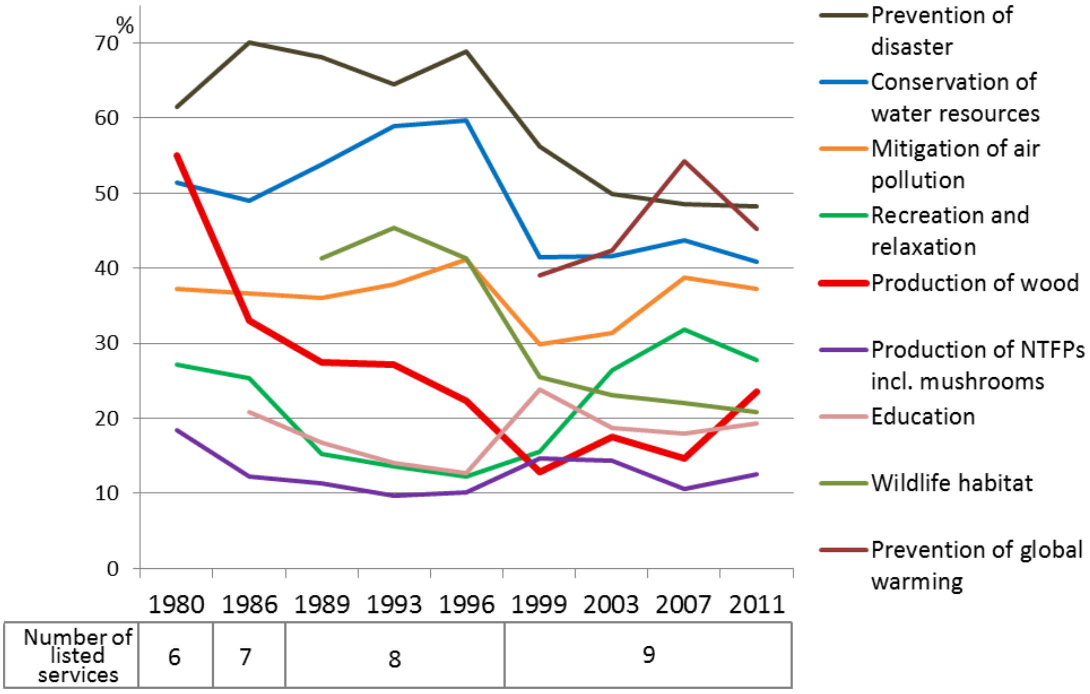

Figure 1: Needs for forests services (Multiple Answers (MA): up to three)

Note: 'NTFP' is an abbreviation for non-timber forest product, such as mushrooms and forest plants.

Sources: Public opinion polls by the Cabinet Office.

3.1.2 Differences between men and women

The proportions of the responses on the needs for forests services differ between men and women (Figure 2). The needs for 'Production of wood' and 'Conservation of water resources' have shown the same gender differences on all of the polls since 1976. The needs for these two services are always much higher among men than women. The need for 'Education', on the other hand, has shown the opposite gender difference—this need has been higher among women than men on all of the polls since 1986 when this need was added to the list of choices. The needs for 'Wildlife habitat' and 'Recreation and relaxation' have been higher among women on most polls.

Despite the observed gender differences noted above, the trends in the rises and falls in the needs for each service have been similar among both men and women. The only exception is the need for 'Recreation and relaxation'; women's need for this has risen rapidly since the poll in 2003. This indicates that the need for relaxation among women is much higher than among men.

In a broad way, it can be summarised that these differences between men and women reflect that men tend to prefer concrete things and material services whereas women tend to prefer intangible inner services.

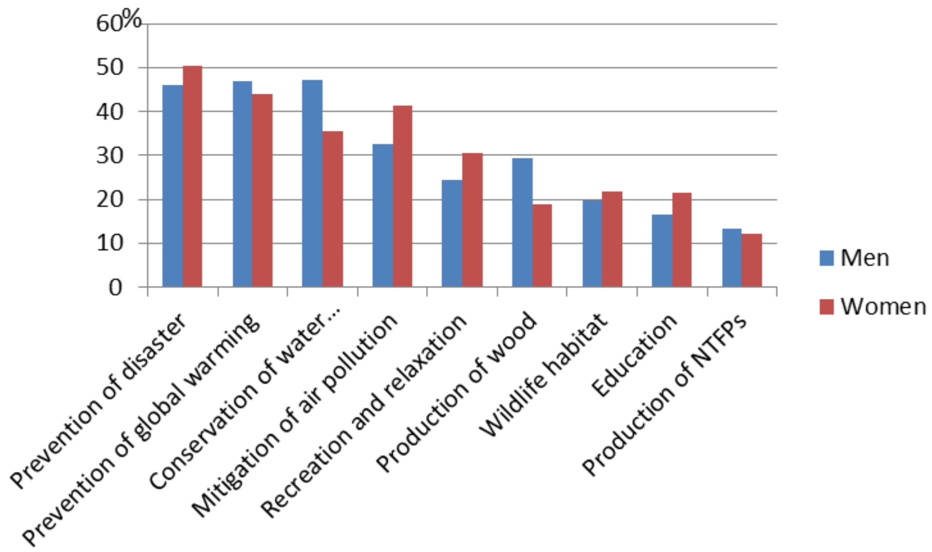

Figure 2: Needs for forests services by sex in 2011 (MA: up to three)

Sources: Public opinion polls by the Cabinet Office.

3.1.3 Differences between age groups

Age is also an interesting factor which is considered to greatly affect the need for forest services. Differences among age classes have been observed for most services (Figure 3). The forest services which are needed by younger age groups much more often than by older age groups are 'Wildlife habitat', 'Mitigation of air pollution', and 'Recreation and relaxation'. These preferences have been observed from 1980s. The forest services which are needed by younger age groups much less often than others, on the other hand, have been 'Conservation of water resources' and 'Prevention of disaster'. The experiences of each respondent could affect these differences in the needs for services. Additionally, 'Prevention of global warming' has been especially preferred among respondents in their 30s and 40s. The need for 'Prevention of global warming' was also high among respondents in their 20s in 1999 and in 2003, and there is a possibility that the preference depends on generation to some extent.

A remarkable decrease in the need for 'Conservation of water resources' among younger age groups has been observed in the results of recent polls. This tendency of low need among younger ages for water resource conservation has been observed since the poll in 1976, but the extent of the low preference on the 2007 and 2011 polls is extreme. Fewer than half of respondents in their 20s selected 'Conservation of water resources' compared with those in their 50s in 2007 and 2011, and this extreme low preference cannot be explained solely by life experience.

The differences in the need for 'Production of wood' across age groups have changed over time. A tendency towards an increased need for the 'Production of wood' among older age groups had been observed since 1986, and the need was rather concentrated among elder men through the 1990s. The need for 'Production of wood' among men in their 20s began to increase starting in 2003, and the increase spread to both men and women in their 20s and 30s in 2011.

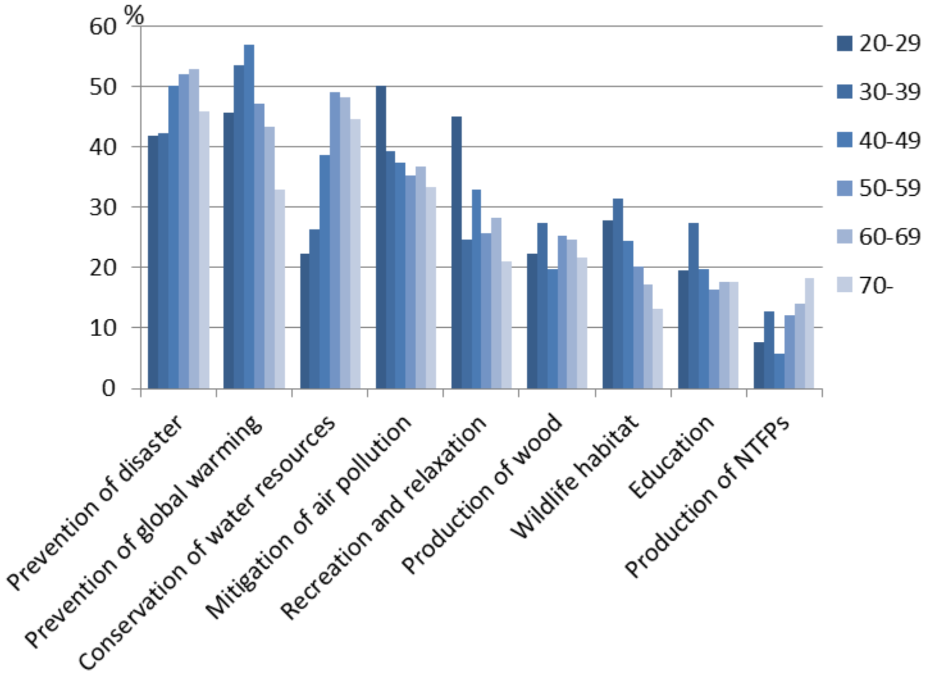

Figure 3: Needs for forests services by age group in 2011 (MA: up to three)
Sources: Public opinion polls by the Cabinet Office.

3.1.4 Differences between area types

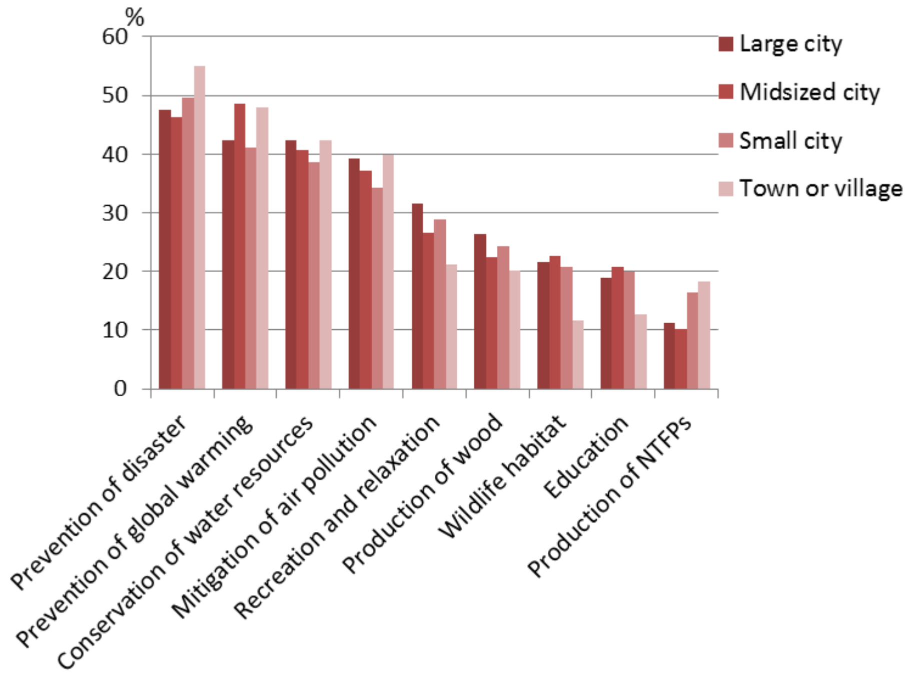

Figure 4: Needs for forests services by size of municipality in 2011 (MA: up to three)
Sources: Public opinion polls by the Cabinet Office.

The changes in the need for 'Production of wood' are also observed in the differences by size of the municipalities where respondents live. From 1976 to 2003, the need for the 'Production of wood' was higher among the respondents living in towns and villages than among those living in larger cities. The tendency became difficult to identify in 2007, and the situation reversed in 2011 (Figure 4). It seems that new advocates for the 'Production of wood' emerged in the 2000s.

The differences in needs by size of municipality have been observed in some other services as well. The needs for 'Recreation and relaxation', 'Wildlife habitat', and 'Education' were low among residents of towns and villages compared with those needs among residents of cities. In particular, the need for 'Wildlife habitat' among residents of towns and villages was remarkably lower than it was others. The needs for 'Prevention of disaster' and 'Production of NTFPs' were, on the other hand, higher among the residents of towns and villages.

The need for 'Conservation of water resources' is affected to some extent by the region where respondents live. In the poll conducted after a serious drought in a particular region, the need for water resource conservation in that region has sometimes risen temporarily.

3.2 Preferences for forest policy

3.2.1 Needs for forest policy measures

Figure 5 shows the trend in the needs for forest policy measures from 1999 to 2011. The most-needed measure throughout the entire period has been 'Disaster prevention facilities', which was cited by 70% of respondents on the 2011 poll. Even among the respondents in their 20s and their 70s, who have presented with the lowest needs among various groups by attribution, 63% cited 'Disaster prevention facilities' as a needed measure. The need for 'Preservation of native forests' is, on the other hand, a measure for which needs have been divided by age group and respondents' areas of residence. Elder respondents and respondents living in towns, villages, and rural areas have cited this measure less often than have others.

Preferences in forest policy measures are affected by the needs for forest services to some extent. For instance, the respondents who selected 'Production of wood' as a needed service cited 'Promote wood supply' as a needed measure much more often than did others. The linkages between the service 'Prevention of disaster' and the measure 'Disaster prevention facilities' and between the services 'Education' and 'Recreation and relaxation' and the measure 'Supply of recreation sites' have also been observed clearly. Furthermore, the respondents who chose 'Wildlife habitat' as a needed service tended to choose many more needed measures than did others. The measures they notably selected much more often have been not only 'Preservation of native forests' but also 'Support for mountain villagers' and 'Enriched volunteer opportunities'.

It is profoundly interesting that the trends in the needs for forest services have not always been linked to the trends in the needs for forest policy measures. In the case of disaster prevention, the needs for forest services are on a declining trend, as Figure 1 shows, whereas the needs for policy measures have remained high. The trends relating to wood production present a notable observation: The need for 'Production of wood' has increased in the 2000s, as previously discussed, whereas the need for the policy measure 'Promote wood supply' has not changed much. The respondents who selected 'Promote wood supply' much more often than others on the 2011 poll were elderly respondents and residents in towns and villages. The new advocacy for wood production among groups such as younger respondents and residents in larger cities, which has been observed in the needs for forest services, has not been observed in the responses about needs for forest policy measures. This probably indicates that these new advocates tend to need wood production without public support.

The responses for 'Support for mountain villagers' are interesting from the aspect of the relationship between urban and rural area residents. The proportion of respondents who chose 'Support for mountain villagers' remained relatively high throughout the 2000s. It seems a noticeable reverse relationship between urban and rural that the residents of larger cities and non-agricultural areas cited this need much more often than did others. The issue of conflict between urban and rural areas, on the other hand, is the need for 'Preservation of native forests'. Residents of towns, villages, and agricultural areas selected this measure less often than did others. The lower preference for 'Preservation of native forests' among the rural population could possibly be considered a feeling of rejection by the people who feel anxious about being affected by this measure.

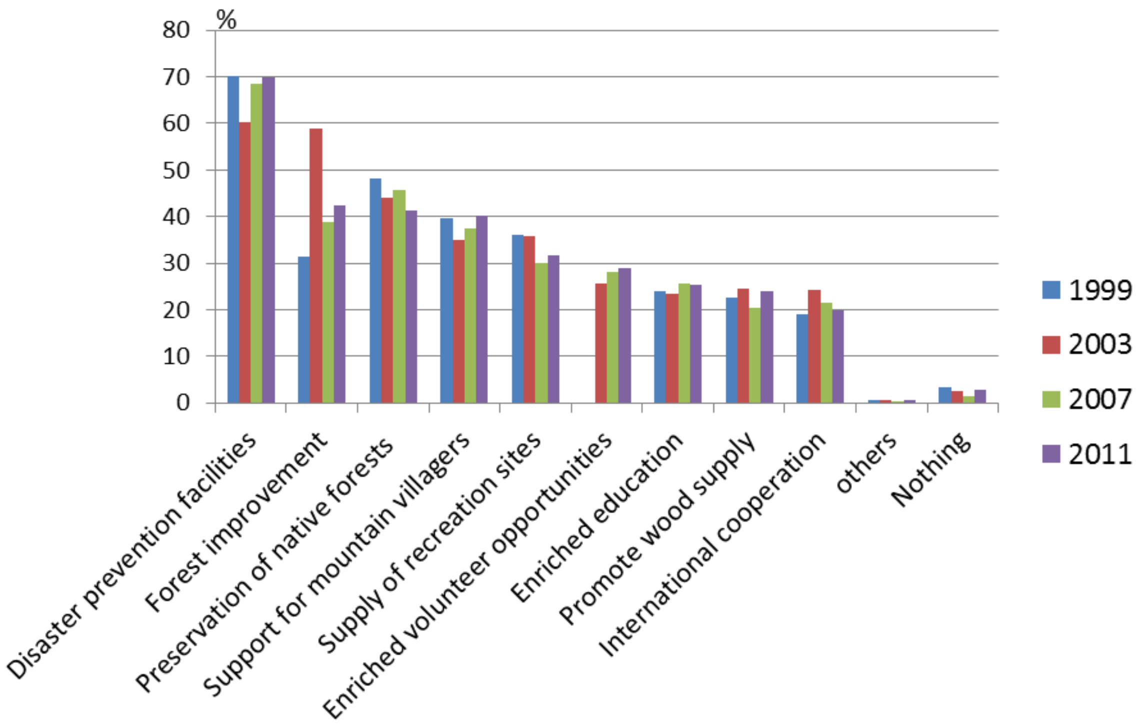

Figure 5: Trends in the needs for forest policy measures (MA)
Sources: Public opinion polls by the Cabinet Office.

On the 1976 poll, the questions about needs for forest policy measures were asked in a different way. The interviewees were asked first whether they perceived any needs the government should meet. Those who responded 'Yes, there are', 50% of the interviewees, were asked to select the needed policy measures (multiple answers were allowed). The most-selected measure among them was 'Control the operation of harvesting and planting (selected by 43% of the respondents)', followed by 'Prevention of overexploitation (30%)' and 'Preservation of natural forests (30%)'. A direct comparison of the data in Figure 5 is difficult, but it is possible to note the following two differences in the 2000s compared with 1976: (1) the need for forest policy measures themselves has become far more widely accepted among the population and (2) what the forests are expected to provide for the public now takes greater priority among the population than what people do in forests.

3.2.2 Necessity of forest improvement activities

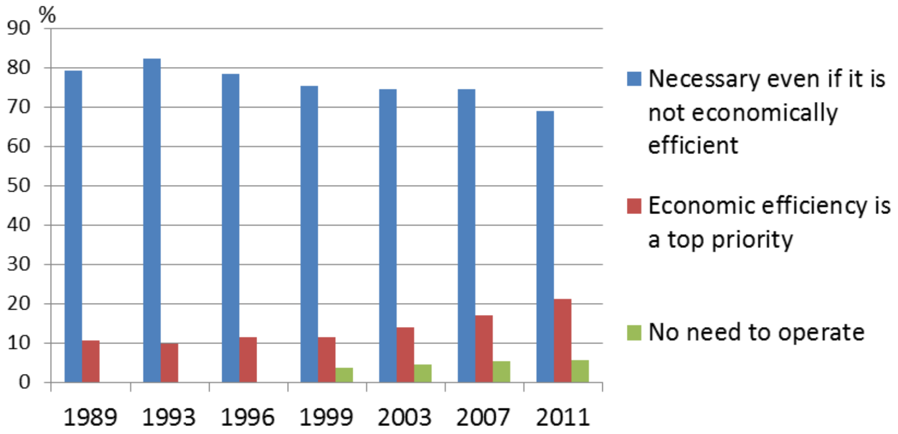

Figure 6: Necessity of forest improvement activities (Single Answer (SA))

Note: The polls from 1989 to 1996 did not offer the choice of 'No need to operate'.

Sources: Public opinion polls by the Cabinet Office.

Promoting forest improvement activities, such as thinning within the proper periods, has been one of the main issues towards which the Forestry Agency has taken active measures in the last few decades. Respondents are asked their opinions on the necessity of forest improvement activities (Figure 6). Most respondents think forest improvement activities are necessary even if the activities are not economically efficient. The proportion of the respondents, however, is on a declining trend since 1993. The proportions of respondents who think that the decision of whether a forest improvement activity should be pursued or not should be based on economic efficiency and who selected 'Economic efficiency is a top priority', on the other hand, increased clearly in the 2000s.

The proportions of respondents who think forest improvement activities are necessary are higher among those who cited 'Prevention of disaster', 'Prevention of global warming', 'Conservation of water resources', and 'Wildlife habitat' as needed services. The respondents who selected productive services much more often than did others, such as men in their 20s, and the respondents who said that they do not feel familiarity with forests, on the other hand, selected 'Economic efficiency is a top priority' much more often than did others. An increase in the opinion that 'Economic efficiency is a top priority' in 2000, however, can be observed among all groups noted above, and the increase in the opinion that 'Economic efficiency is a top priority' can probably be considered a general trend among the entire population of Japan.

3.2.3 Control measures of forest improvement activities

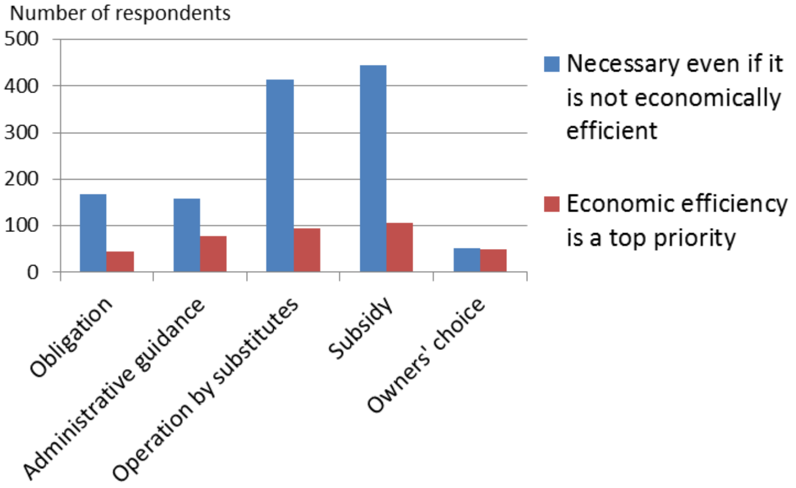

Figure 7: Control measures of forest improvement activities in 2011 (SA)

Note: This question was asked of the respondents who chose 'Forest tending operations are necessary even if it is not economically efficient' or 'Economic efficiency is a top priority" on the previous question.

Sources: Public opinion polls by the Cabinet Office.

The opinions on the necessity of forest improvement seem to affect the preference of the related control measures (Figure 7). The preferences of the respondents who think forest improvement activities are necessary have been concentrated in 'Subsidy' and 'Operation by substitutes', which are the most typical measures implemented by the Forest Agency and most local governments in Japan. The preferences of respondents who emphasise economic efficiency are, on the other hand, divided among all choices including leaving it up to 'Owners' choice', which was selected by only 4% of the respondents who think forest improvement activities are necessary.

The respondents who selected 'Subsidy' cited the highest number of needs for forest policy measures; in particular, the needs for 'Disaster prevention facilities', 'Forest improvement', 'Preservation of native forests', and 'Support for mountain villagers' were notably higher than they were among others. The respondents who selected 'Owners' choice', on the other hand, cited the lowest number of needs for forest policy measures, particularly the needs for 'Forest improvement', 'Support for mountain villagers' and 'Promote wood supply'.

Compared with the results from the 2007 poll, the proportion of respondents who selected 'Obligation' and 'Subsidy' have decreased, whereas those of respondents who selected 'Owners' choice' and 'Operation by substitutes' have increased. The decrease in the proportion of respondents who selected 'Subsidy' and the increase in the proportion of respondents who selected 'Owners' choice' are observed among almost all groups who had the same attributes and also among the respondents who gave the same answers to the questions which are analysed in this paper, so this can also be considered a general trend among the population in Japan.

4 Discussion and Conclusion

Based on the findings from the analysis described above, the following four facts can be identified as the trends and structure of public opinion on forestry and forest policy in Japan. First, environmental services which are expected to prevent damage to life have been given top priority as not only as forest service needs but also as necessary forest policy measures for all 30 years of the surveys. The extremely low need for water resources conservation among the younger age groups, however, has been observed in the latest two polls, and it is possible that the highly prioritised need for this service will change in the future.

Second, the differences between the sexes, age groups, and, partly, areas of residence affect the preferences for forest services and forest policy measures. For instance, broadly, men tend to prefer concrete, material services whereas women tend to prefer intangible inner services. These facts may suggest that the participation of citizens with different attributes, especially the participation of minority groups, should be taken into consideration in decision-making processes relating to forestry and forest policy issues.

Third, conflicts between urban and rural areas are considered to exist in the preferences towards wildlife habitat and the measures for native forest preservation. With the preference for services related to wood production and the measures for supporting mountain villagers, on the other hands, there is an interesting reverse preference in which urban populations have been observed in the 2000s to tend to prefer these much more often than do rural populations.

One final and noteworthy point regarding the perception of forestry is the new trend observed in the need for wood production services in the 2000s. In this decade, new advocates for wood production are considered to have emerged among young and urban populations. They seem to tend to emphasise economic efficiency, and they seem to need wood production without support from the government. This possibly indicates that the perception of forestry has reached a significant turning point, especially in terms of its change from the public to the private domain. Furthermore, the emphasis on economic efficiency has been observed throughout the whole population in the 2000s, and a fundamental review of the domain and design of forest policy could be needed in the near future.

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[AS3-4]

Bridging the distance – ownership, residency and self-performed work in Swedish family forestry

Gun Lidestav[1] and Solveig Berg Lejon[2]

1 Introduction

With the foreseen shift towards a post-petroleum bioeconomy, forests are expected to increasingly contribute to the production of energy and provide a wide range of environmental and social services in addition to its traditional role as timber supplier for the forest industry. In Europe, woody biomass is by far the largest source of renewable energy (Mantau et al. 2010) and projections of the European Forest Sector Outlook Study II (UN 2011) indicate that the supply of woody biomass in Europe must increase by nearly 50 % if wood is to play its part in reaching renewable energy targets by 2030. Hence, a major challenge is mobilizing enough wood on a sustainable basis (Jonsson et al 2013). As more than half of the forest land in Europe is owned by (mostly) small-scale individual owners (Pulla et al 2013), their interest, willingness and capacity to manage their forest land is vital. However, in this respect concerns due to an ongoing transformation of the ownership structure of the European non-industrial private forest (NIPF) have been raised by authorities, industry as well as researchers.

Boosted by societal megatrends such as economic globalization of agricultural and forest products, labor, demography and urbanization, the number and diversity of private forest owners is growing (see e.g. Hogl et al 2005, Ziegenspeck et al 2004). The most apparent and direct impact on the transformation can be attributed to the structural changes of European agricultural sector in general and the family farming system in particular, as much of the small-scale forest ownership historically has been associated with small-scale farming (Hogl et al 2005). This connection is gradually dissolved, and replaced by ownership characterized by fragmentation due to sub-division of land, joint ownership, and alienation due to little or no involvement in management of the forest in combination with living outside the forest property. The growing share of “new” types of forest owners can according to Hogl et al (2005) be distinguished from “traditional” forest owners by; i) distance of the owners’ residence to their forest ii) urban residence iii) lack of connectedness with agriculture in terms of work, iv) socialization and economic relevance for the individual household. In sum, there is a growing distance or gap between the owner and his/her land. However, these “new” forest owners may on the other hand give high values to other goods provided by the forest property e.g. hunting, recreation, biodiversity and the possibility to keep contact with their place of birth and upbringing (Lidestav and Nordfjell 2005; Nordlund and Westin 2011, Ziegenspeck et al 2004).

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A general observation is that harvesting levels are falling in many European countries and that attitude and behavior change among NIPF owners is a major contributing factor (Follo 2011). Sweden is one important exception, where harvesting and wood biomass supply from NIPF is kept on a high level (Swedish Forest Agency, 2013) although migration from rural to urban is also affecting the residential pattern of Swedish family forestry. Paired with the increasing mechanization of harvesting operations, most NIPF forest owners choose to hire contractors for logging or sell the timber on stumpage basis to dealers or large companies (Lindroos 2006). According to official statistics only 11% of the harvested volume is felled and hauled by the forest owners themselves (Swedish Forest Agency, 2013). For silvicultural operations (scarification, planting and cleaning) the estimated figures are significantly higher, 43 % (ibid). Overall, this implies that NIPF owners and their families in 2011 spent some 11.2 million hours doing self-performed work (SPW) in their forests, which corresponds to 40% of the total number of working in harvesting and silvicultural operations in Swedish forestry the same year. As the NIPF owners mainly use manual or motor-manual methods, most of them cannot be regarded as professional, and consequently the productivity is lower than in large-scale forestry and for professional contractors. However it is evident that the predicted discontinue of forest owners involvement in forestry operations is not yet at hand, but still the knowledge of whom does the work and what their motives are, is fading. Is it done by those who still reside on or nearby their property only as part of their livelihood? Or, is it an expression of non-resident owner's desire to bridge the physical distance to their forestland, and keeping up with their forest-owner tradition? And further, what impact does it have from a societal perspective, if forest owners are self-active or not?

Thus, the aim of this paper is to make a more detailed assessment and description self-preformed work (SPW) in contemporary NIPF in Sweden, and more specifically address the issue of "distance" both in physical and mental sense. The usefulness and the disadvantages of self-performed work will be discussed from an individual perspective, and a societal perspective.

2 Material and Methods

A quantitative analysis of the self-preformed work (SPW) was performed using data held by the Swedish Data Base for Forest Owner Analysis (DBFOA) regarding forestry activities of 2010. This database contains survey data regarding harvesting and silviculture gathered by the Swedish Forest Agency on an annual basis. Fore a detailed description of the database, see Berg Lejon et al (2011). In the analysis concerning the distance between forest management unit and the respondent forest owner only those who reported any SPW were included (692 out of 1164) and their permanent address were identified. Postal code for both forest management unit and respondent forest owner's permanent address were used to calculate the coordinates for both forest management units and the permanent address. The coordinates for the permanent address were accessed from Statistics Sweden according to the grouping of postal code by the Post in April 2010. The center of the largest property in the forest management unit represents the coordinates of the forest management unit.

To get more in-depth information on the motives for self-performed work, two sourced of qualitative data were used; narrative accounts collected in 1999 (for detailed description see Lidestav 2010) and focus group interviews carried out in 2006 (for a detailed description see Lidestav and Arvidsson 2011).

3 Results

When dividing the 1164 respondents (DBOFA 2010) into ownership categories reflecting the distance between owner(s) and their forest estate, using the same criteria and definitions as Swedish Forest Agency, we found that three-quarter of all forest estates are in hand of owners living in the same municipality as the forest estate (Table 1). In addition, 6% of the estates have at least one of the owners living in the same municipality. Consequently, only a small number (15%) of estates have none of the owners living nearby. Further, estates with two or more owners of which all or at least one of them lives outside the municipality appears to be somewhat large. On those estates, self-performed work (SPW) is also less likely to take place. The highest occurrence of SPW is found on estates with two or more owners living nearby (65%) followed by single owners living nearby (57%). Overall, it was estimated that SPW occurred on 51 percent of all estates (not presented in table) which corresponds to 116,000 management units. Dividing the 11.2 million working hours reported by Swedish Forest Agency (2013) on those estates, the average input of SPW during a specific year can be estimated to 96 hours per estate. When looking at specific activities, other cuttings respectively cleaning are the most common followed by thinning and final felling. Whether we look at the

Table 1: Occurrence of self-performed work (SPW) in 2010 by different ownership categories

	Single owner, living within the municipality	Two or more owners, living within the municipality	Two or more owners, some living within the municipality	Single owner, living outside municipality	Two or more owners, all living outside municipality
Proportion of ownership categories, %	48	28	6	11	4
Mean size of forest property, hectare	47	50	73	49	62
Properties with occurrence of any SPW, %	57	65	45	43	37
SPW final felling, %	20	15	20	13	15
SPW in thinning, %	29	25	20	20	10
SPW in other cuttings, %	40	45	36	22	34
SPW in scarification, %	8	8	8	7	7
SPW in planting, %	14	15	8	11	11
SPW in supplementary planting, %	6	8	4	6	15
SPW in cleaning, %	34	39	26	26	28

general picture or the individual activities, there is a similar pattern showing that one (or more) owners living nearby the forest estate have a positive impact on the occurrence of SPW. Considering what has been reported in previous studies (e.g. Lidestav and Nordfjell 2005) and the plausibility of a negative relationship between SPW and increasing distance, this finding is by no mean unexpected. However, we find the level of involvement in SPW, particularly in final felling and thinning, surprisingly high.

Still, it has to be considered that "living within the same municipality as the forest estate" is a very broad definition in terms of distance. In Sweden there are municipalities with 20 km as well as 200 km between the extremes, meaning that some forest owners defined as living nearby actually have to travel a much longer distance to reach their forest property than some of those living outside the municipality of their forest estate. Therefore, a more detailed analysis of the actual distance between the owner and the forest estate was carried out. For all the 692 respondents that have indicated any SPW, sums of specific activities performed on each individual forest estate were calculated. From the scatterplot in figure 1, it is evident that less distance increases the likelihood of multiple SPW on the forest estate. Yet, there are forest estates with owners living on the property (0 km distance) were only one SPW has been carried out. Within the span 0-100 km there are quite a number of estates with 4 or more SPW, indicating that both harvesting and silvicultural activities have been carried out. Also in the span 100-400 km, estates with several SPW can be found, but beyond 400 km no more than two SPW per forest estate is reports. On none of those long distant forest estates final felling, scarification or supplementary planting were carried out as SPW (figure 2) while cleaning occurred on 11% of the long distant estates.

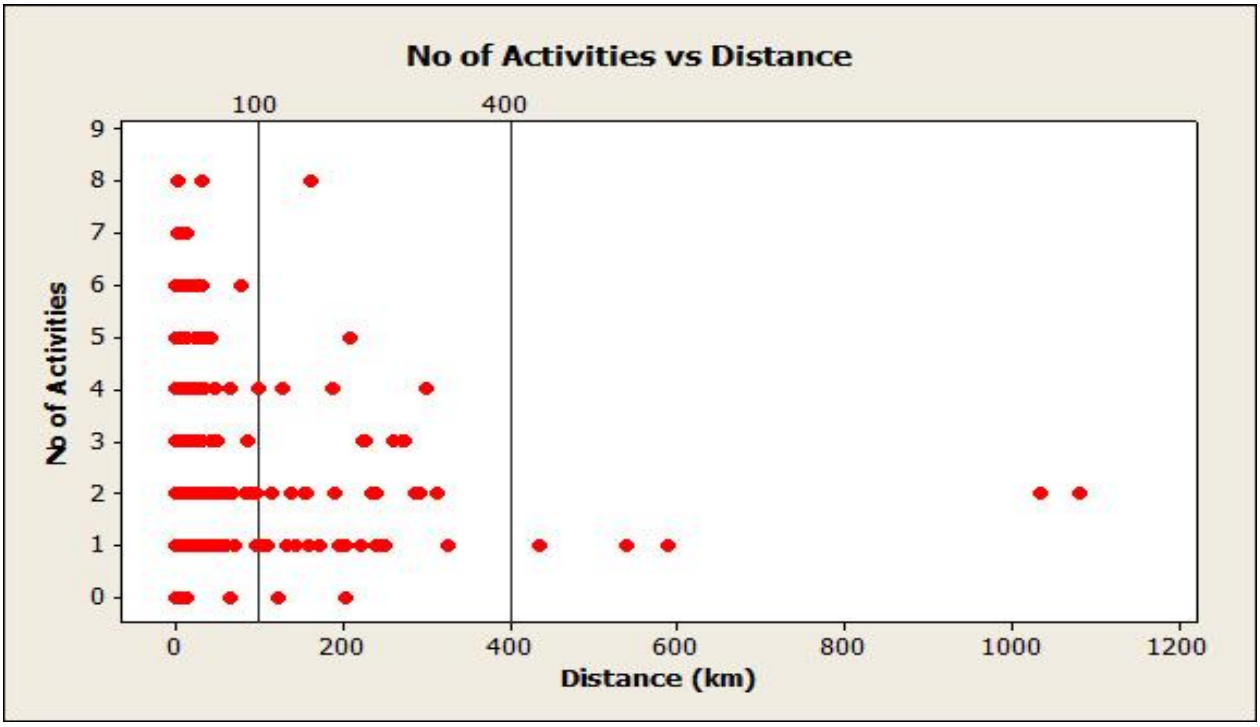

Figure 1: Number of self-performed activities (SPW) by distance between the forest owner and his/her forest estate (n=692).

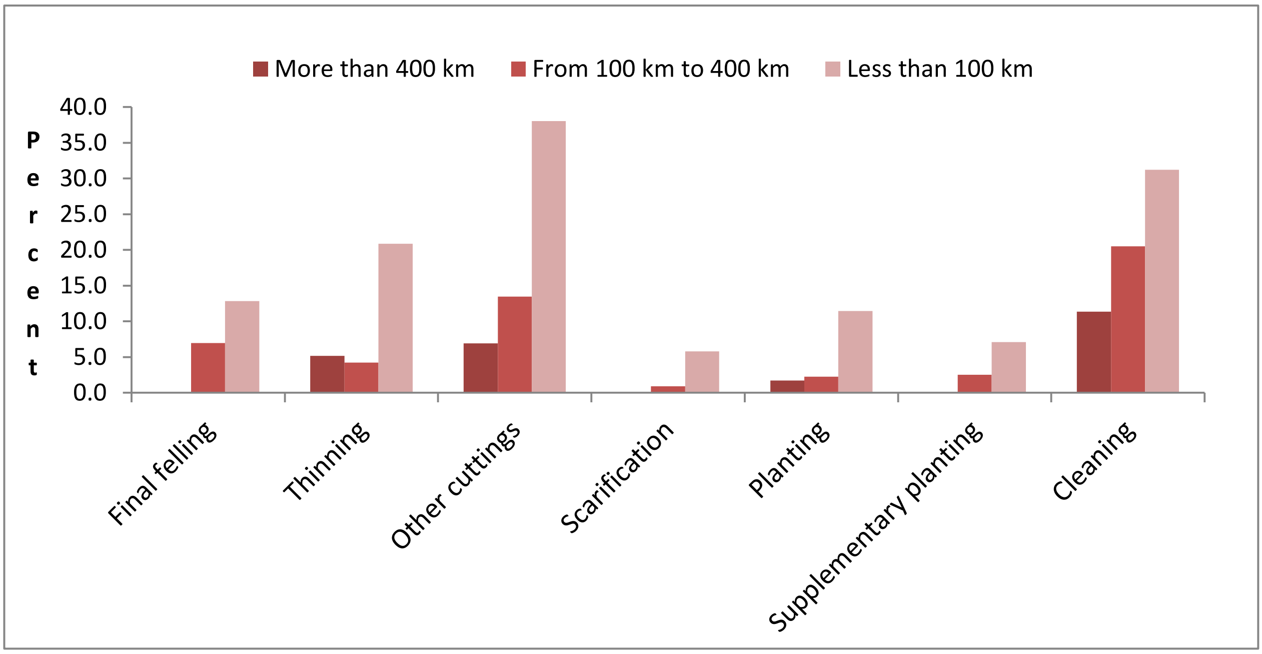

Figure 2: Proportion of forest estates with self-performed activities in different harvesting and silvicultural operations (n=692).

4 Discussion

Previous studies have shown that an overall goal for most forest owners is to hold on to the property, and to manage it in such a way that it can be handed over to the next generation in an equal or even better condition than when they received it (see e.g. Lönnstedt 1997). Furthermore, the forest property can be regarded as a "project that spans generations" not only in terms of economic value but also in terms of knowledge and emotional values of which one is "to keep up with a forest farmer tradition (Törnqvist 1995, Lidestav and Nordfjell 2005, Lindroos 2006). According to Ager (1995) the motives for SPW can be categorized as i) family tradition ii) economic motives iii) job satisfaction iv) control of the condition and development of the forest.

The last motive is of particular interest in relation to the "new" and more ambitious forest policy introduced in 1993 placing environmental goals in parity with production goals, but at same time giving the forest owners more of 'freedom with responsibility' compared to previous (Appelstrand 2007). With this deregulation there are no longer any obligations of harvesting or cleaning and neither any subsidy for silvicultural measures that are not directly profitable. Basically the only obligation is to do to take measures necessary to achieve satisfactory results regarding reforestation after final felling (could be by seed trees or planting with or without scarification). According to Appelstrand (2007 p. 302) this imply an apparently paradoxical where "one set of goals, environmental goals, can easily be interpreted as counter to the economic interests of forest owners, yet in legislation forest owners were given greater autonomy, voluntarism was the order of the day and enforcement instruments were taken out of the hands of state authorities and funding to these authorities was decreased." To reach the production goal (i.e. an efficient utilization of the forest and forest lands) and the environmental goal (i.e. maintaining the naturally given productive capacity and securing biological diversity and genetic variation) knowledgeable and competent NIPF owners are decisive. Even if the NIPF owners do not carry out the operations themselves, they have to know what has to be done, how it should be done and be able to evaluate the result. Previous studies indicate forest owners with good or at least approved results of reforestation are more likely to be self-active (Lundqvist 2004). Furthermore, self-active forest owners are more likely to harvest and do silviculture operations, and seems also to be more inclined to take environmental considerations (Lidestav and Berg Lejon 2011)

Yet, it could be argued that as long as the NIPF owner has the competence to order and purchase the service from professional contractors or forest companies, this will be more economically viable. If the 11.2 million working hours in SPW would be converted to paid jobs, some additional 3000 - 4000 full-time forest workers would be needed. Based on the cost for different forest operations reported by forest large-scale forest companies (Brunberg 2012), a rough estimate of the economic value of SPW can be done. SPW in harvesting and hauling corresponds to approximately 100 million Euro and in cleaning and planting to about 75 million Euro. To perform this work, forest owners buy equipment and machinery. Lindroos (2006) estimated the sale of items suitable for SPW to sum up to 67 million Euro in 2002. Investment in equipment is thus substantially less than the value of SPW.

Without claiming to provide a comprehensive or systematic analysis of “family tradition” and job satisfaction” motives, I would like to conclude the presentation by a couple of quotations illustrating the value of SPW from the perspective of the individual NIPF owner and his/her family.

“Forestry work has become like a necessity for me. I get out in the forest; get fresh air and some proper exercise. My previous problem with a stiff neck due to desktop work is a thing of the past. I work with my hands and I can see the result of my efforts in years to come. It is a very good variation to my regular job, and I can spend my leisure time with my husband”. (Ragnhild Larsson, Forest Museum SKB. Authors translation).

“Planting has become a family business for adults and children. We bring coffee and sandwiches; enjoy the fresh air and plant with love and care” (# 24, Forest Museum, SKB. Authors translation)

“Together we plan and discuss the different management operations; it makes it much more enjoyable. My partner do the thinning and final felling, I do the pruning, planting and cleaning we share, depending on time and possibility” (#13, Forest Museum, SKB. Authors translation)

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[AS3-5]

Electronic wood marketplace: www.puumarkkinat.fi

Efficiency and transparency to roundwood trade

Erno Järvinen[1]

1 Introduction

Private forest owners play an important in the Finnish wood supply. The number of individual timber sales concluded in Finland each year is about 100,000, in some years even 140,000. The private stumpage earnings have in the 2000's annually been around 1.5 billion euros. The transaction costs for roundwood buyers are remarkable. They are estimated to be around 250 million euros annually. There are around 600 professional roundwood buyers in several companies.

The operation of the Finnish roundwood market has been assessed in several studies during the last decade. Competition in the market has been considered fairly effective (see e.g. Kniivilä 2009 and Pöyry 2009). The sawlog market has been found to be more competitive than the pulpwood market, which is showing signs of imperfect competition. The Finnish wood market's characteristics in comparison to other countries include a strongly consolidated forest industry and centralized demand for wood.

In the roundwood market assessments one very often mentioned improvement proposal for enhancing effectiveness has been electronic marketplace. By using electronic services savings could be achieved. According to surveys both forest owners and roundwood buyers are willing to use electronic services in roundwood trade.

Radical reforms in the Finnish roundwood market procedures are rare. Transactions have been conducted in much the same way for decades. In the spring 2010 The Central Union of Farmers and Forest Owners MTK decided to start financing implementation of electronic roundwood marketplace. www.puumarkkinat.fi was launched by MTK in January 2013.

2 Functioning of the electronic roundwood marketplace

Puumarkkinat.fi is an electronic bulletin board, where forest owners can market their timber lots countrywide. Service is map-based and registered roundwood buyers have real time information on private forest owners' roundwood supply. Roundwood buyers can evaluate lots and quote a price for those they find interesting.

By forest owner's letter of attorney, forest management association transfers information about timber lot to the www.puumarkkinat.fi service. Based on the information existing on the website timber buyers are

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able to bid without field visit and hence achieve remarkable cost savings. A single stand is visible for bidding for a pre-defined time, which is normally 5 days. After that final deal and terms will be concluded in face-to-face negotiations. Thus e-commerce is not yet possible.

Access for the front page of the service is free for everyone (Figure 1). In the left column of the front page there is information needed for registration. Central column shows the latest roundwood prices in the seven different geographical areas of Finland. Presented price information is the moving average of the last four weeks in stumpage and delivery sales. Price data is provided by the Finnish Forest Research Institute. The column in the right contains summary information on the supply volume in the service.

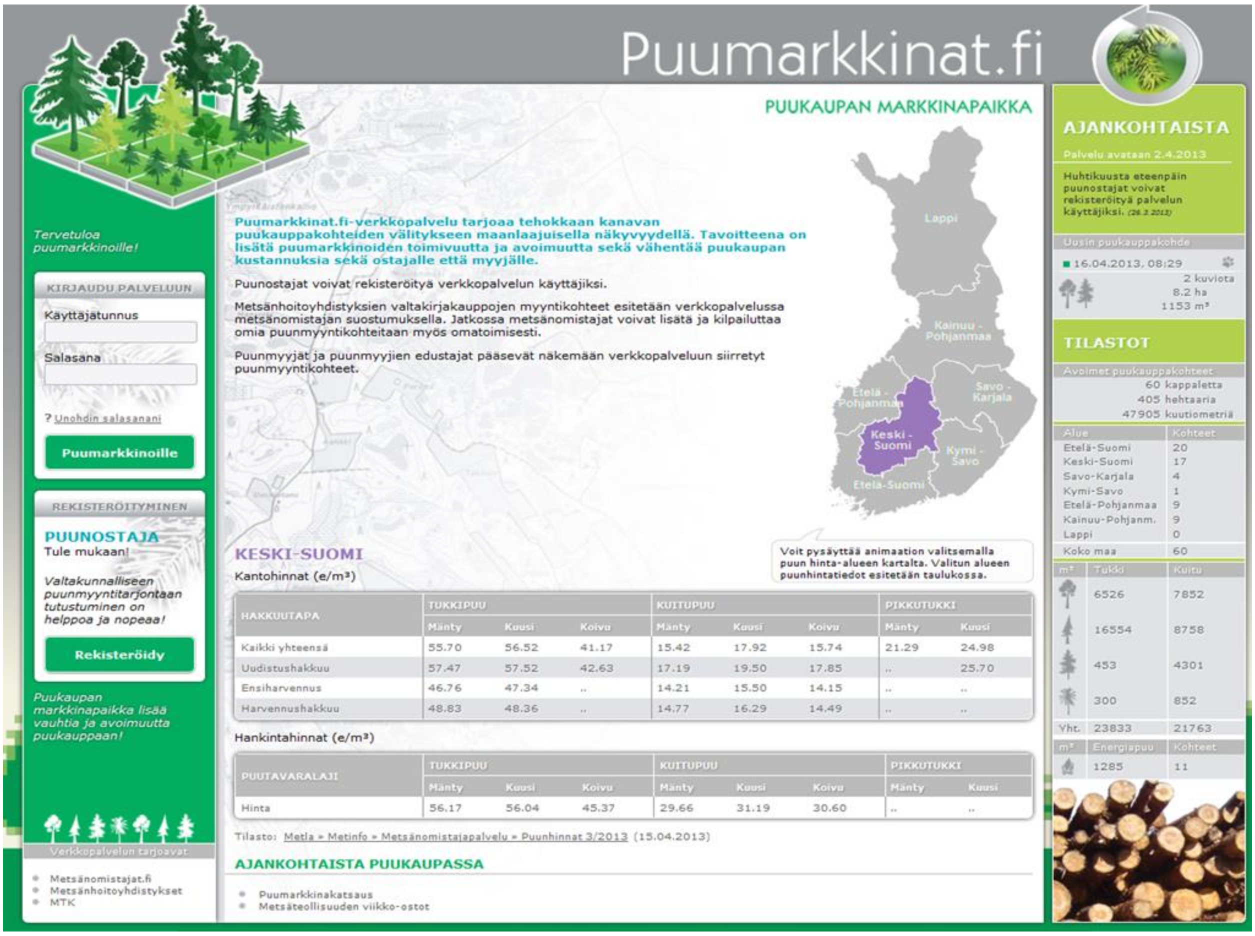

Figure 1: Front page of puumarkkinat.fi

Source: www.puumarkkinat.fi

At the bottom of the page there is information about the terms of use of service and handling of personal data.

Administrator charges operators that are using the service. A single-user license (without VAT) costs 100 euros/year. Those operators, who have from two to four users, pay annually a basic charge of 100 euro plus 50 euros/user. If a roundwood buyer has 5 or more users, the basic charge is 500 euros annually plus 50 euros/user.

Puumarkkinat.fi has been programmed using HTML5 technic and by utilizing existing forest data standards. Service can be used with the following browsers: Mozilla Firefox 19.0, Google Chrome 25.0, InternetExplorer9 and Safari 5.1.7. Front page includes advertisements.

The electronic roundwood marketplace is currently available only in Finnish, but versions in different languages can easily be produced. In addition, the service will have several other development possibilities, e.g. in the future forest owners will be able to add themselves timber lots to the marketplace. In addition, interfaces with roundwood buyers data systems must be set up.

The Figure 2 shows the front page of the registered users. That view summarizes roundwood supply in the geographical area set by the user as a default. In the left column there is a list of all single timber lots on sale in the area selected by the user. For each lot on the list there is a summary of characteristics of the lot, including volume, area, wood species and information on the existence of nature values of special importance.

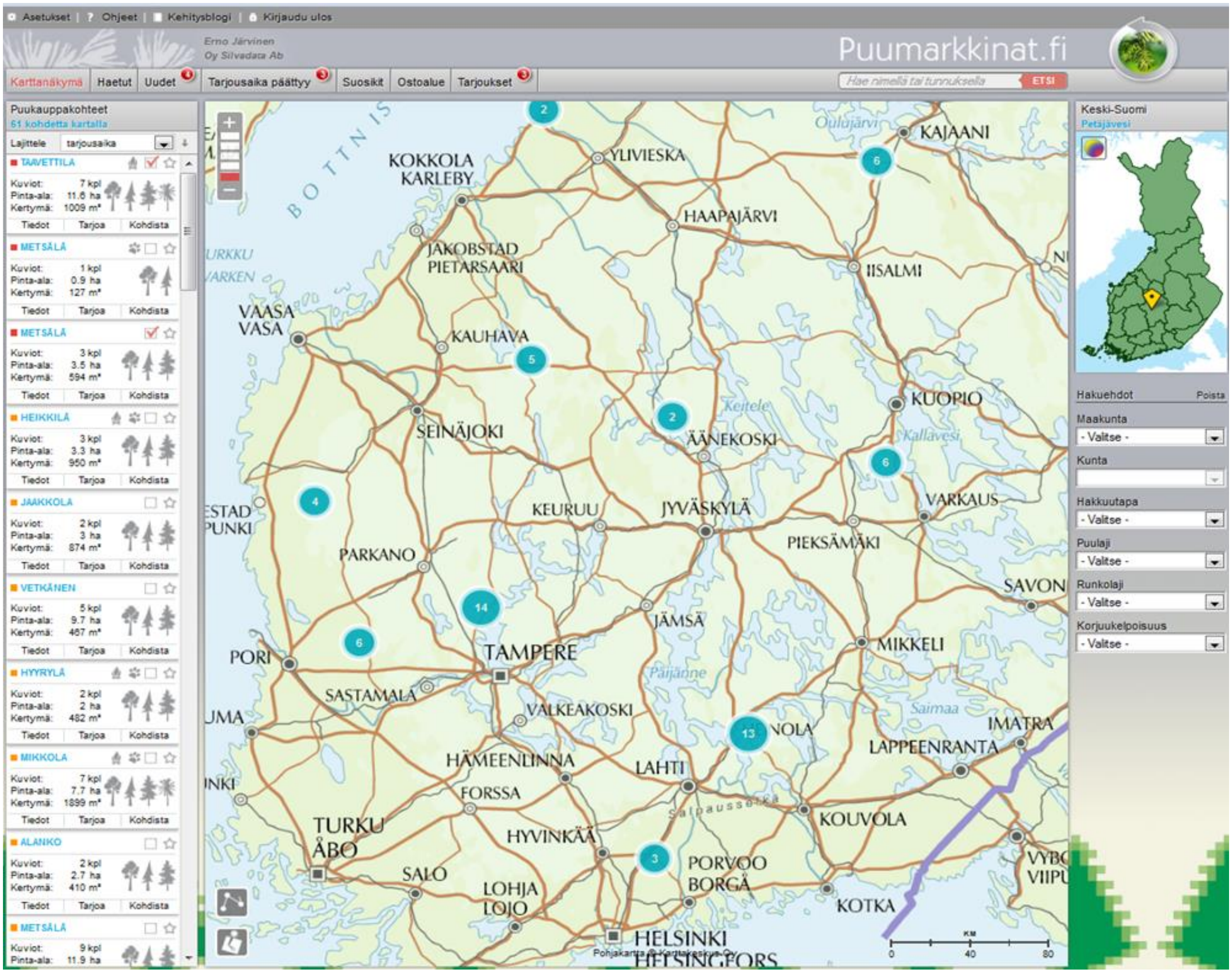

Figure 2: Front page of roundwood buyers' view at puumarkkinat.fi
Source: www.puumarkkinat.fi

On the right column of the front page (Figure 2) the user of the service can set various search criteria concerning province, municipality, harvesting method, wood species, timber sorts and harvesting possibilities.

Figure 3 illustrates the information that registered users can see concerning a single timber lot. Basically it contains all facts that are needed for making a bid, e.g. volume of timber per species and sorts, harvesting methods, haulage distances, wood yard, soil quality, important nature values etc.

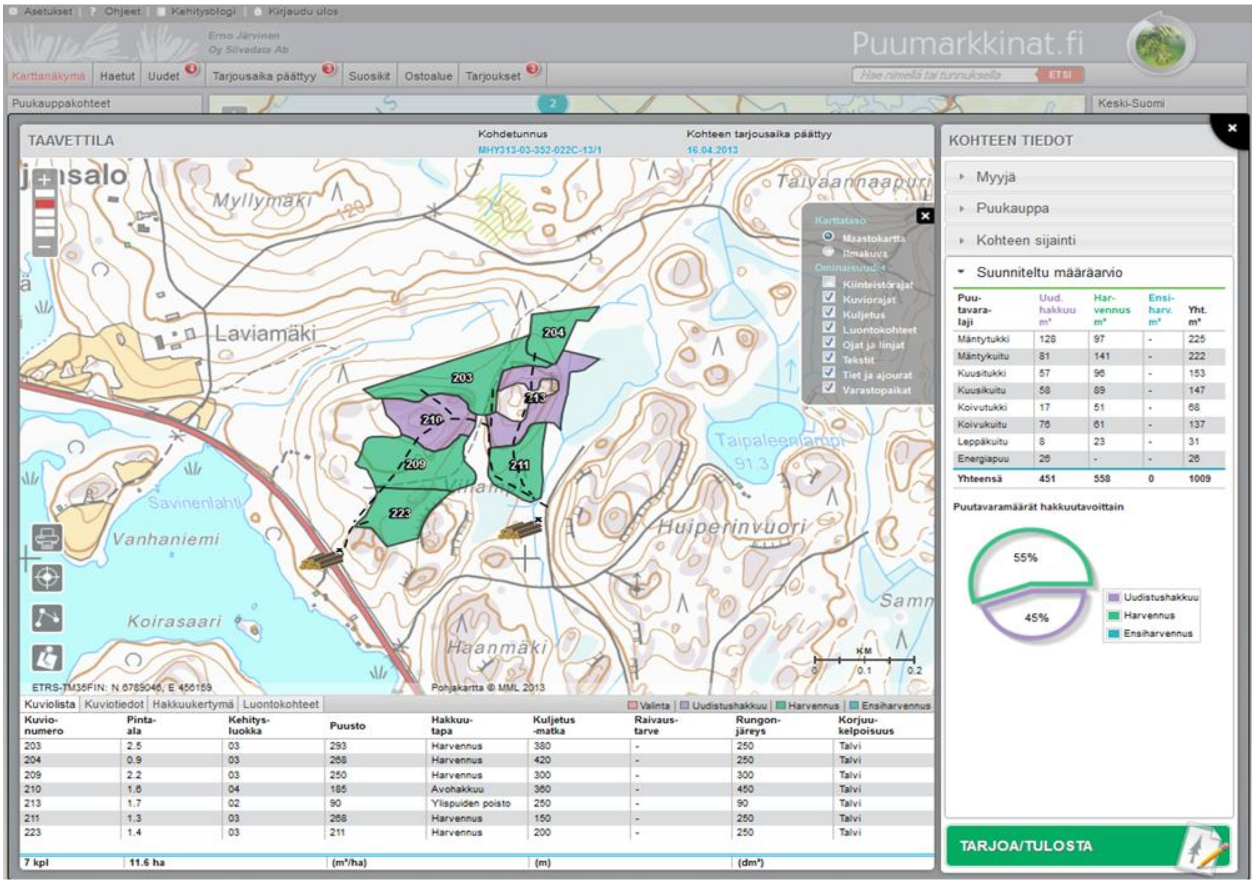

Figure 3: View of a single timber lot at puumarkkinat.fi

Source: www.puumarkkinat.fi

Also a forest owner that has put a timber lot for sale will see similar kind of information of his or her own selling object.

3 The benefits of the electronic roundwood marketplace

In addition to cost savings, electronic roundwood marketplace is also expected to improve transparency of the Finnish roundwood market and hence improve functioning of the market as well as operational environment of the Finnish forest industry. It is expected that annually over 40,000 potential roundwood trades are marketed in the service. By the beginning of August of 2013 53 Finnish roundwood buyers have registered to the service. Their combined market share is well over 95 percent of the annual procurement volume of the privately owned forests. The roundwood supply in the service has since this spring been continuously around 300,000 cubic meters. The number of forest management associations using puumarkkinat.fi in the marketing of timber-lots is also 53 out of 96. The target of MTK is that by the end of the year 2013, at least 75 forest management associations will use puumarkkinat.fi.

In comparison to previous system, in which roundwood buyers got information about timber lots by an e-mail or a letter, puumarkkinat.fi provides an easy way to follow roundwood supply. All roundwood buyers have equal possibilities to explore timber lots that are for sale. For a single forest owner puumarkkinat.fi provides easy, safe, flexible and modern way to provide timber for sale. Puumarkkinat.fi also rationalizes the work of forest management associations' employees. After preparing a timber-lot, he or she just has to click one button.

Acknowledgements

Electronic roundwood marketplace www.puumarkkinat.fi is an outcome of 2.5 years project from June 2010 to January 2013 conducted by Silvadata Ltd Co. and funded by The Central Union of Farmers and Forest Owners MTK and forest management associations.

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[BS1-1]

Migrants, livelihoods and equity: Understanding for Emissions Reduction in Jambi (Sumatra, Indonesia)

Noviana Khususiyah[1], S Suyanto and Janudianto

Abstract

Continuing carbon emissions from conversion of peatlands for agriculture or plantation industry are targets for the Government of Indonesia in achieving a break with 'business as usual', while maintaining national economic growth. Land use by local farmers and spontaneous migrants to the peatlands in comparison with that on adjacent mineral soils is a relevant part of the issue, with indicators of equity relevant for pro-poor, pro-investment policy design for a green economy. The study compared four types of smallholder farming community in the Tanjung Jabung Barat district of Jambi (Sumatra, Indonesia): local farmers on mineral soils and peatland parts of the landscape, government-sponsored migrants on the mineral soils and spontaneous migrants on the peat. Focus group discussions and household survey were employed in the study. Average income per year per household was higher in mineral soil areas than on peat, suggesting that a shift of development towards mineral soils can be attractive for emission reduction. The income of transmigration villagers was about three times that of local villagers, because they grow oil palm and rubber. The older migrants have invested in coffee agroforestry under betel palms with lower profitability than the oil palm chosen by more recent migrants prioritize. Equity of income is higher in the peat soil areas than in mineral soil areas, as indicated by a lower Gini ratio. Financial surplus from oil palm income for transmigration villagers is used to buy new land from the local community and invest in oil palm expansion, further increasing the income gaps.

Keywords: agroforestry, peatland, rubber, oil palm expansion, income, Gini ratio

1 Introduction

Indonesia made voluntary international commitments to reduce carbon dioxide emissions through its NAMA (national appropriate mitigation actions) plans; it committed itself to reduce emissions 26% below the 2020 'business as usual' level, expecting a further 15% reduction with international support. The target is to achieve this emission stabilization at approximately the level of 2005 without compromising economic growth, aiming for 7% of GDP (gross domestic product) growth per year. These national targets require sub-national strategies in low-carbon emission development plans that fine-tune the design of interventions for a green economy. An understanding of current livelihood strategies in high- and low-emission parts of the landscapes is required. In Indonesia's lowland peat areas the total carbon stocks per ha are at least 10

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times as high as those on mineral soils (Agus et al. 2011) and emissions are high during conversion from forest to other land use, as well as in recurrent annual emissions due to drainage of the peat. Districts that have both peatland and mineral soils are a natural laboratory for operationalizing low emission development strategies. Tanjung Jabung Barat in Jambi province, neighbouring Riau province, is such a district; its estimated annual emissions from land use change alone were 6.6 ton CO_2 eq/ha/year for the 1990-2005 period, more than twice the average for Indonesia and one and half times the average for Jambi, the province with third-highest emissions per unit land area, after Riau and Central Kalimantan province (Ekadinata et al. 2011).

Emission reduction requires a break with current land use practices that have evolved because of providing local livelihoods. New forms of investment may be needed to support forms of land use that reduce emissions without decreasing human welfare. As different actors, both large-scale and smallholders, local communities and migrants are usually involved; reduced emission development may involve shifts between these groups. Basic data on current land use practices as source of income is needed, along with the equity-enhancing or equity-reducing characteristics of the various activities.

The objectives of the livelihood characterization study for Tanjung Jabung Barat district were to study: 1) land use strategies on the peatland and mineral soil parts of the District, lined to main land users and associated changes over time; 2) the livelihood strategies that include off-farm activities; and 3) the poverty and equity dimensions of different activities. The results can inform the design of emission reduction interventions in the district and others with similar characteristics.

2 Methods

2.1 The Study Area

The study site is Tanjung Jabung Barat district in Jambi Province, Sumatra, Indonesia (Figure 1). The total area is around 5,000 km^2 with almost 40% peat area in the east towards coastal areas. About 48% or 240,000 ha of the district is classified as ‘forest area’. About 71% of ‘forest area’ is classified as production forest, 6. 65% is protected peat forest and 3.66% is a national park. The proportion of ‘non forest area’ in this district is very high, dominated by coconut agroforestry, rubber agroforestry, rubber monoculture and most recently palm oil.

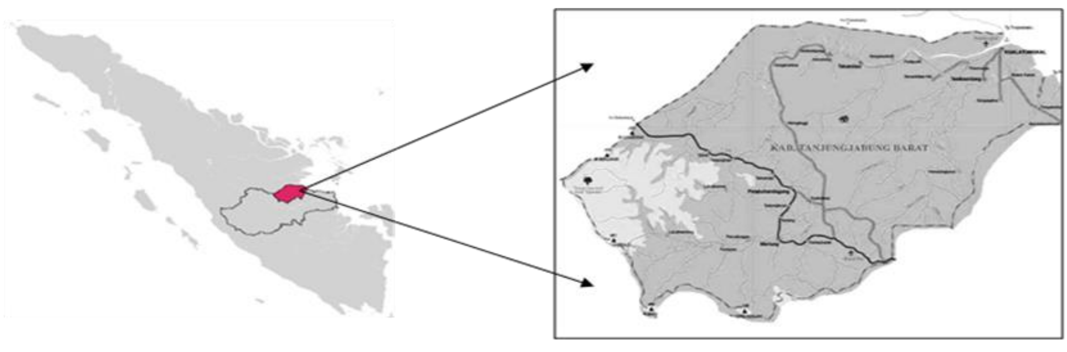

Figure 1: Location of Tanjung Jabung Barat district, Jambi province, Sumatra, Indonesia

In 2009, the population was approximately 266,952, with a density of 51 people/km^2. Early migration occurred in the 1940s to 1950s. These people were typically of Bugis and Banjar ethnicity, from Sulawesi and Kalimantan Island. More significant migration to this site occurred in 1980s and 1990s with the transmigration program. Transmigration was established to get establish a labour force in the area in order to develop large scale palm oil plantations. The study area is portrait of peat land areas in Indonesia with high pressure of migration and developing of oil palm plantation.

2.2 Research Method

The livelihood study using data collected from community and household interviews. Based on the type of soil (mineral soil and peat soil) and migration type (migrant and local community) we stratified the community in the study site into four strata which are as follows; 1) the local community living on mineral soil; 2) the transmigrant and spontaneous migrants on mineral soil; 3) the older migrant community on peat soil; and 4) the recent migrants on peat soil.

Eight focus group discussions were used to gather information on sources of livelihood, land management practices, demography, poverty, and major development or commercial activities. About 10 to 15 people representing the formal and informal leaders were invited to attend one day of discussion from 8 am to 5 pm in every focus group discussion. Following up on issues raised at the focus group discussions, more quantitative data was collected through a household survey (in-depth interview). Forty respondents were interviewed in the mineral area (some transmigrant village people and some local village people) and 40 in the peat area (some old migrants from the village and some recent migrants from the villages). As much as possible, both the husband and wife in each household were interviewed together.

3 Results and Discussion

3.1 Livelihood options

This section discusses the various livelihood options of the communities in the study area. It identifies what major and important livelihoods are at the present, as well as the changes of community

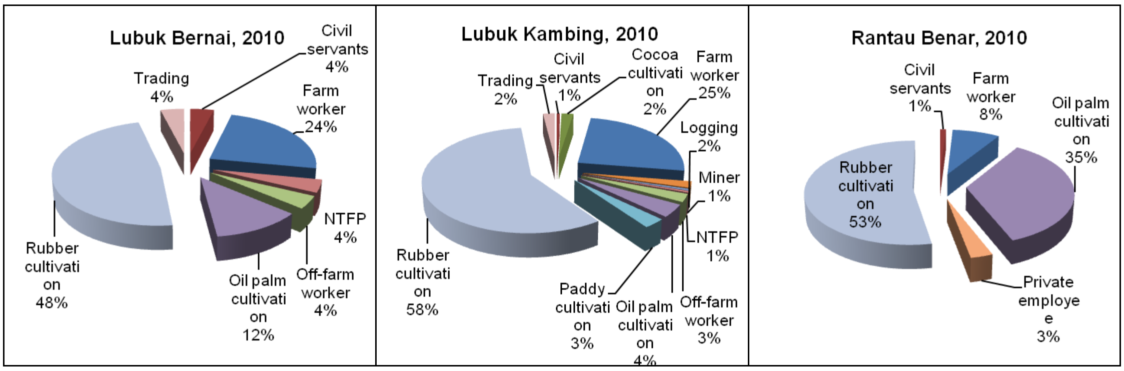

Figure 2. Components of main livelihoods strategies in mineral soil-local community

livelihoods in different periods and strata. Changes of livelihoods were examined for fivetime periods: 1) the early years of a village's establishment; 2) 1970's (logging concession period); 3) 1990s (transmigrant and oil palm period); 4) 2000's (reformation era); 5) the current time (2010). We interviewed three different community strata: 1) the local community living on mineral soil; 2) the transmigrant/spontaneous migrant community on mineral soil; and 3) the migrant community on peat soil (historic and recent migrants).

The local community on mineral soil were the Malay people who already lived in the villages before the 1900s. The history of agriculture systems in this area began more than a century ago, and over time the systems have transformed from sub-systems to become more market oriented. Currently, the livelihoods of most communities rely more on commercial tree-crops such as rubber and oil palm, and many people work as farm labourers (Figure 2).

The transmigrant and spontaneous migrants on mineral soil area were mostly come from Java island. People in this area rely on commercial tree-crops, especially oil palm. Currently, important livelihoods in the region are oil palm cultivation, daily labour for oil palm companies, farm work, livestock work and trading.

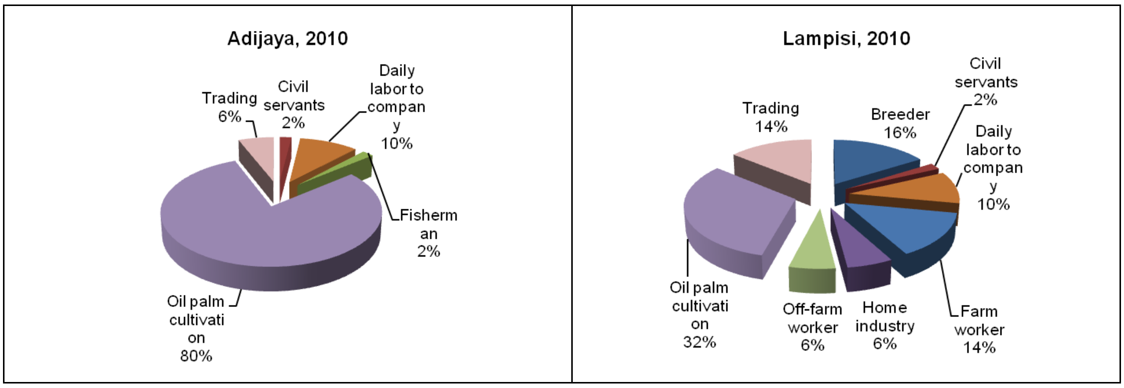

Figure 3. Components of main livelihoods strategies in mineral soil-migrant community

The transmigrant and spontaneous migrants on mineral soil area were mostly come from Java island. People in this area rely on commercial tree-crops, especially oil palm. Currently, important livelihoods in the region are oil palm cultivation, daily labour for oil palm companies, farm work, livestock work and trading.

The two transmigrant villages located in the mineral area shows oil palm option is still a main source of income, but there are others. Villages and communities are more developed; there are off-farm sectors such as home industries. Entrepreneurial ventures and trading are fairly advanced. In contrast, in the newly established transmigrant villages, dependency on oil palm is very high, reaching about 80% of total livelihoods. This figure is followed by labourers who work at the oil palm companies (10%) (Figure 3).

The migrant community in the peat soil area is comprised of migrants (both historic and recent) who have come from Banjar, Java, and Bugis since the 1900. The migrant people mostly rely on agricultural sectors that require specific drainage systems (canal and ditch) to manage and drain excess water, avoid high level of peat acidity, and to prevent flooding in tidal phases. They spent a lot of money in order to maintain the drainage system.

Recently, coconut agroforestry and coffee agroforestry were major sources of livelihoods in peatland villages. However, oil palm is also an important source of livelihood. It has been predicted the role of oil palm will increase because of its profitability. Other sources of livelihood are farm work, off-farm work, swamp paddy cultivation and rubber harvesting (Figure 4).

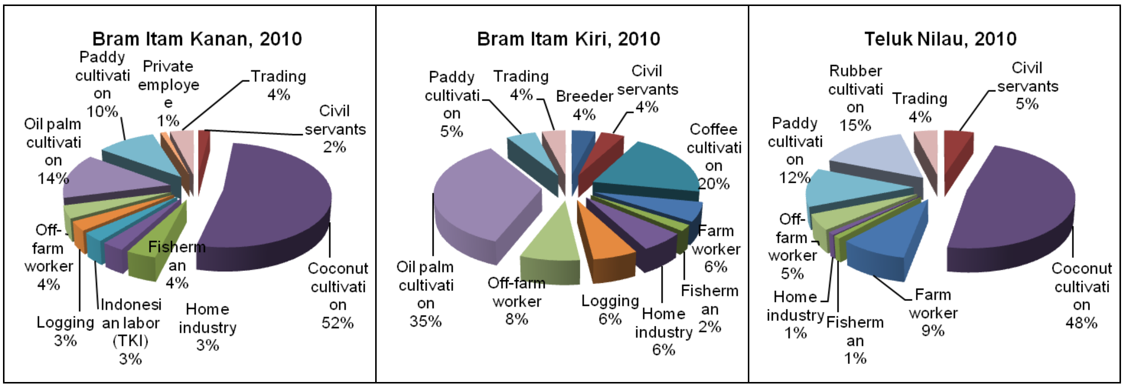

Figure 4. Components of main livelihoods strategies in peat-migrant community

3.2 Land holding area of the household

Based on our survey of 80 households, our findings reveal that the average land holding of transmigration villagers in mineral soil was the highest (8.12 ha), following by recent migrants in peat (6.19 ha), local villagers in mineral soil (4.91 ha) and the lowest was old migrant villagers in peat (4.37 ha) (Figure 5).

The compositions of land holding by land use types were different across the sites. Transmigration villagers owned 99.6% of oil palm and only 0.4% of bush fallow. The ratio of transmigration villagers to oil palm was very high. However, the composition of land holding by land use for local villagers in mineral soil is different. They owned 35% of oil palm, 35% of rubber, and 30% of bush fallow.

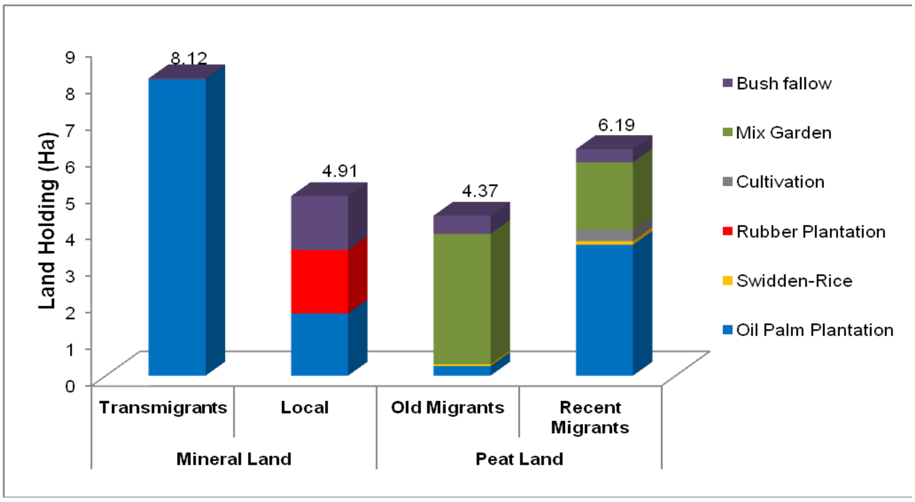

Figure 5. Land holding per household

In peatland, the agroforestry or mixed garden system that consists of a mix of coconut with betel palm (*Areca catechu*) and/or coffee is very important for old migrants. The average mixed garden plantation (agroforest) land is 3.56 ha or 81% of total land holdings while the average oil palm land is 6% and bush fallow 11%. The swidden-rice percentage is very small.

All land belonging to transmigration, local and old migrant villagers is private land. However, for the recent migrants in peat, around 71% of total land holding is state land. They planted mostly oil palm (82%) and a small area is used for a mix of gardens and bush fallow. The private land belonging to the recent migrants is located far away from the village or in the previous villages of the migrants and it is mostly planted by mixed trees (agroforestry).

3.3 Poverty and equity status of the household

3.3.1 Poverty analysis

We used income as a quantitative indicator to assess the poverty of the studied area. The calculation of income included the value of commodities consumed. However, most of income came from cash crop (crops grown for profit).

The average of total income per year per household in the mineral area was higher than in the peat area. However, the difference of income between transmigration villagers and local villagers was high. The income of transmigration villagers was about three times of local villagers. In contrast, the income of old migrants and recent migrants in the peatland area was almost the same. The daily income per capita of transmigrant villagers in the mineral area was IDR 71,455 (USD 7.9)[1], local villagers was IDR 25,046 (USD 2.8). In the peat area, the daily income of old villagers was IDR 32,484 (USD 3.6) and recent migrant villagers was IDR 27,816 (USD 3.1) (Figure 6).

The average family size ranged from 3.1 to 3.8 members at both sites. Using the international poverty line standard of USD 1.00 a day (the World Bank standard), the percentage of respondents living below the international poverty line in mineral area and in peat area was none (0%).

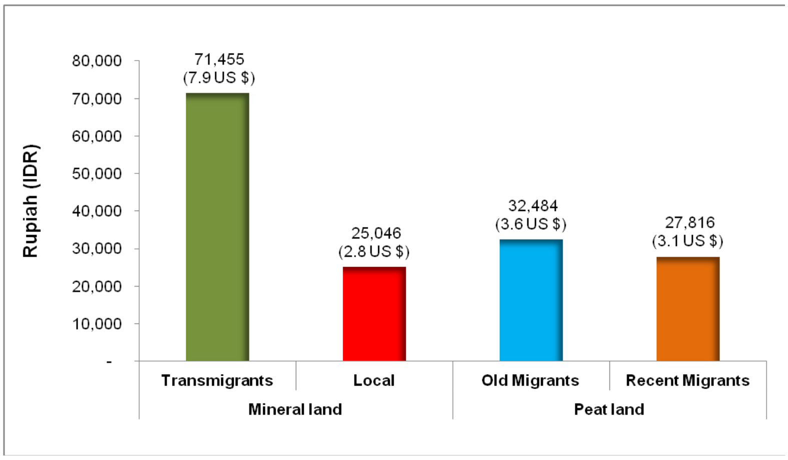

Figure 6. Income per capita per day

The basic income equation for income from self-employment (in agricultural or business) is:

$$I = \sum_{i=i}^{n} p_i y_i - \sum_{j=1}^{m} q_j v_j$$

[1] Average exchange rate in 2010 was USD 1 = IDR 9,000.

Income (I) is gross value (price times quantities of all n products) minus total costs (price times quantities of all m purchased inputs), for example, fertilizers, seeds, tools, hired labour (Angelsen and Lund, 2011). Agriculture is the major source of income in both the mineral and peat areas, but the type of agricultural income is different. In transmigration villages in the mineral area, the highest source of income is from oil palm plantation (75.24%), while rubber plantation (60.68%) was the major source of income of the local villages in the mineral area. The share of income from oil palm plantation in local villages in the mineral area is low (8.90%) (Figure 7). It is expected the share of income from oil palm will increase in the near future as about 35% of land holdings are currently immature oil palm.

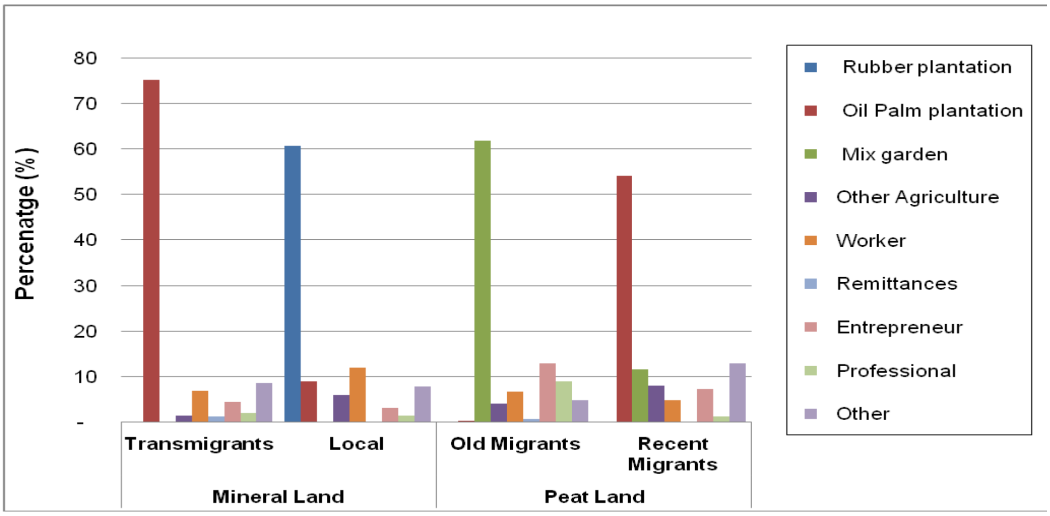

Figure 7. Household income by activity type (%)

In the peatland area, the major source of income between old migrants and recent migrants is also different. The highest source of income for old migrants is the mixed garden (62%), while oil palm (54%) is the major income for recent migrants.

3.2.2 Equity analysis

In order to analyze the equity of income, decomposition analysis was applied using the Gini coefficient that ranges from 0 (equal distribution of income) to 1 (total concentration of income). Gini decomposition is commonly applied in economic analysis, it is a (Alderman and Garcia 1993) formula that was developed by Fei, Ranis, and Kuo (1978) and Pyatt, Chen, and Fei (1980). The computation results of the decomposed Gini ratios show income is higher in the mineral areas (0.39) than in the peat areas (0.22), but this figure is relatively small. This indicates that income at both sites is equally distributed.

The assessment of income inequity s calculated using the concentration coefficient. A source of income is influential in improving income equity if it has a concentration coefficient of less than 1. On the contrary, if the concentration coefficient is higher than 1, the source of income is influential in causing income inequity.

Income from rubber plantations reduced the overall inequity of income distribution at the mineral area. This suggests that the income from rubber plantation is relatively equally distributed, making this income important in reducing poverty and increasing income equity. On the other hand, income from oil palm plantations from private land leads to unequal income distribution in the mineral area. Wealthy farmers often extend their private land through purchasing, which seems to have concentrated the income from private land into the hands of fewer people. In contrast, in the peat area, income from oil palm plantation on state land reduced inequity of income, since forest areas were more available in the peat area (Figure 8 and Figure 9).

The coefficient concentration for mixed gardens (1.89) showed an increase in the inequity of income in the peat area, and the share of income was high (37.52%). This implies the value of mixed gardens in the peatland area is high.

Working (assessed through wages) from agriculture, especially in oil palm plantation, makes up an important share of total income (5.76% - 8.28%) and the concentration coefficient was lower than usual for both sites, which implies a distribution that is equal. It is important to note that for poor farmers, their wages are a very important income source.

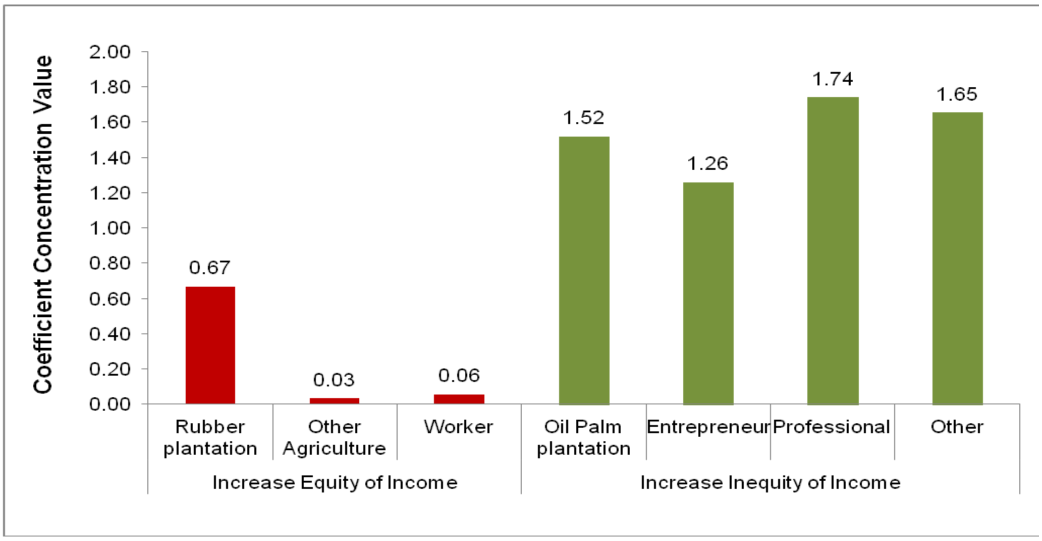

Figure 8. Coefficient concentration in mineral area

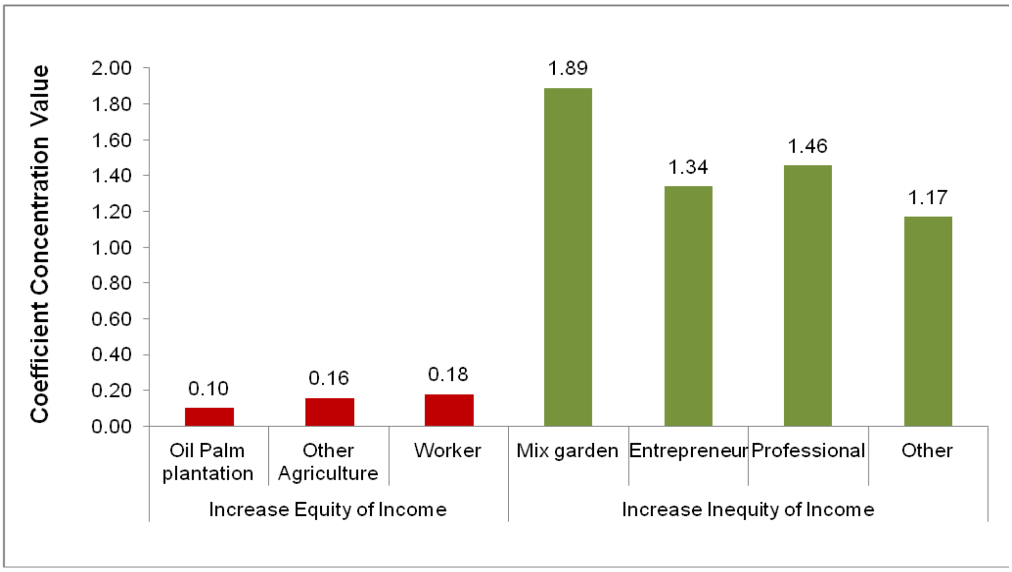

Figure 9. Coefficient concentration in peat area

Other agriculture (agriculture from household gardens and livestock) also reduces income inequity at both sites. About 2.85% - 5.89% of total income is from 'other agriculture'. Non-farm income (entrepreneurship and professional work) is more unequally distributed at both sites, the mineral area and the peat area. Income from entrepreneurship accounted for 4.10% of total income in the mineral area and 10.18% in the peat area. Income from professional work was 1.88% of the total income in the mineral area and 5.20% in the peat area. Most non-farm income came from professional work requiring higher skills, higher education and large amounts of capital, such as teaching, government positions, *warung* (small shops) and trading. Therefore, non-farm income widened the income disparities between individuals and households in the community.

4 Conclusion and Policy Implications

This study shows the welfare level among different community types, as indicated by income and land holdings are different. The average of total income per year per household in the mineral area is higher than in the peat area. However, the difference of income between transmigration villagers and local villagers is also high. The income of transmigration villagers is about three times that of local villagers. In contrast,the income of old migrants and recent migrants in peatland is almost same. The compositions of land holding by land use types were different across the sites. Most of the transmigration villager land was oil palm. The composition of land holding by land use for local villagers in mineral soil is different, dominated by rubber and oil palm. In peatland, the agroforestry or mixed garden system that consists of a mix of coconut with betel palm (*Areca catechu*) and/or coffee is very important for old migrants's income stability.

The equity of income is higher in the peat area than in the mineral area, indicated by a lower Gini ratio. Income inequity is very high between transmigrant and local villagers in the mineral soil area. The surplus from oil palm income for transmigration villagers is used to buy new land from the local community and investing in oil palm expansion, further increasing the income gaps.

Designing an intervention of emission reduction without understanding the livelihood strategy of communities can often lead to misleading recommendations. In this study, the economic situation of villagers has been outlined. Some of these implications from this study are as follows:

- A total restriction of the development of oil palm will have a negative impact on smallholder livelihoods. The development of oil palm can still continue but it should be converted from the land that has a lower carbon stock. Rahayu et al. 2011 reported the average carbon stock of oil palm plantation is 40 tonne C per ha. Not converting land that has carbon stock of more than 40 tonne per ha could be used as a threshold for a policy.
- Reward rubber agroforestry farmers by giving technical assistance, providing good planting materials, increasing the quality of slab and improving their access to the market.
- Policy development in local villages should be a priority in order to reduce the income inequity between transmigrant and local villages.

- Rehabilitate degraded peatland area with agroforestry systems such as coffee, coconut, betel nut, and *jelutung*.
- Consider restricting large scale development programs in peatland in order to avoid the environmental and socio-economic impacts of large-scale demographic shifts.
- Prioritize livelihood development for local village in order to decrease the income gap between transmigrant and local village.

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[BS2-1]

Women Participation on Community Forest Management in Gunungkidul Yogyakarta Indonesia

Silvi Nur Oktalina[1]

Abstract

Gender equality issues on many aspects become priority in *Millennium Development Goals (MDGs).* Women participation in development is for accelerate the objective of development. Decreasing of women role in development will influence the development process it selves. As general it is also happened in community forest development. Women role on community forest development is started from planning, planting until marketing of community forest products.

This research is part of social dimension analysis (SDA) on overcoming constraint community based commercial forestry (CBCF) project that funded by ACIAR, cooperation with Indonesia ministry of forestry. The objective of this research is to analyze women participation on community forest management. This research was conducted in 2 villages in Gunungkidul district that had certification on sustainable community forest management. Method of the research was focus group discussion (FGD), and the participants consist of 10 men and 10 women. FGD was done separately. Indept interviewed was done to give detail explanation. Analysis of the data was using a mixed method which combines quantitative and qualitative methods to provide a more in-depth explanation.

The research finding shows that according men and women perception, community forest management is dominated by men. Male dominance is especially shown in the following activities: (1) determine the types of trees to be planted, (2) planting trees, (3) maintain the trees, (4) cutting down trees; (5) determine the time of harvesting (6) cut trees (7) bargain price of timber to the trader; (8) farmer group meetings attending. While women do not have the dominant role of the community forest management activities. Some of the activities carried out by women such as to determine the species of agricultural crops, and maintain and harvest the agricultural crops is done together with the men. Based on the research finding, women empowering and increasing role of women in community forest is importance issue.

Keywords: women, community forest, participation, Gunungkidul

1 Introduction

Development of community forests in Indonesia today has increased significantly. Data from the Ministry of Forestry in 2009 the total area of communiity forest in Indonesia reached 3,589,434 ha. Of the

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total community forest area turned out to 2799.81 hectares or 77.98% are located in Java. From the same data source shows that the potential standing stock for community forests as much as 125 627 018 m³. While the potential of ready to harvest reached 20,937,836 m³. The number is certainly very significant because the current national timber production reached 43,655,101 m³. Potential largest private forest harvesting in Java, which reached 16.3 million m³.

In addition to generating potential standing stock for for carpentry and wood for fuelwood, community forest also collected non-timber forest products leaves, foder for cattle, medicines and crops and understory . Community forest has also conservation function such as a barrier to soil erosion and landslide as well as storing carbon stocks in trees, litter or in the soil.

Community forest management today is still manage individually by the owner and not much synergy between the three function of communiity forest. Recently farmer strated to manage community forest in a group so sustainable forest management can be improve as communal in economic of scale. This is will affect the technical community forest management in the field in planning, organizing and yield regulation .

Development of community forests in Java certainly can not be separated from the history of the development of community forests in Gunungkidul. Gunungkidul area with critical economic and social conditions in the province of Yogyakarta. Data from the Forestry agency in Gunungkidul show that in the last 2 years ie 2009 and 2010 have been the increasing of the community forest area of 2597.85 ha or by 8.2%. In early 2009 the community forest area in Gunungkidul is 29073.98 ha and in 2010 increased to 31671.83 ha. In 2010 production of teak logs 85403.815 m³, mahogany m³ 6696.310, and rosewood 3360.773 m³. The number of sawmills in the medium-large scale in Gunungkidul as many as 24 units, 18 units of craft industries as well as furniture and carpentry industry as much as 206 units. Timber transaction results in Gunungkidul have been able to contribute revenue of Rp. 569 651 906 for local government.

In the era of forest management paradigm has changed from conventional forestry to social forestry, the forest include community forestry is one of the sub-systems of a regional development system, so the forest is expected to participate to solve the regional development problems. Community forest development aims to give maximum benefit to the people while conserving forest and social functions of the forest as well as improving the environment quality. The successful of this aim must be support by the community it selves while another stakeholders such as government, NGOs and industry. Woman as part of the community should be able to play important roles in the community forest rather that as objects of development. Active participation of women in every process of development will accelerate the achievement of development goals. Less involvement of women, will slow down the development process or even women can be a burden of development itself. The low quality of women also affect the quality of future generations, since they have a very large reproductive role in developing the human resources of the future.

This research presented here intends to know the woman participation on community forest. This research is part of social dimension analysis (SDA) on overcoming constraint community based commercial forestry (CBCF) project that funded by ACIAR, cooperation with Indonesia ministry of forestry. The objective of this research is to analyze women participation on community forest management.

2 Method

The basic method of this research was a focus group discussion (FGD). Key questions was prepared to guide the discussion related community forest management and role of men and women. FGD was done with participant men and women separately. Semi-structured in-depth interviews were conducted with the villagers, head village and key persons. Analysis of the data was using a mixed method which combines quantitative and qualitative methods to provide a more in-depth explanation.

3 Result and Discussion

3.1 Community forest management system

Community forest management according Atar (2010) consists of three interrelated sub-systems are sub-systems of production, processing sub-systems and marketing sub-systems.

a. Production sub system

According to the Research Institute of IPB (1990 in Attar 2000) production sub system consists of 3 activities are planting, maintenance and harvesting. Community forest management is done with agroforestry technique. Intercropping is done between agricultural crops and trees. Agricultural crops that combined with trees such as maize, cassava and beans. Some locations also planted vegetables such as beans, mustard and pepper. While the trees that dominate community forest in Gunungkidul is teak, acacia and mahogany.

1. Planting

Planting activities is preceded with land preparation. Land preparation is done by making the planting hole and cleaning the area around the planting hole. Before the seeds were planted in the holes manure. The seeds used are usually derived from stump in their own land or their neighbors' land. But lately more farmers are starting to buy seeds of certain trees. The farmers also seed from either the government or from other parties.

Activities carried out by farmers after planting seedlings is ready for planting and has entered the rainy season. Some farmers planted at a spacing of 4 x 4 m, but most farmers plant seeds randomly by planting on land are visible there is still no tree without regard to spacing, so that existing trees appear less regularly. There are also farmers who handed levels of regeneration in natural regeneration.

2. Maintenance

Community forest maintenance activities performed Gunungkidul farmers is weeding. Weeding is done in conjunction with the maintenance of agricultural crops and sometimes in conjunction with the activities necessary for livestock grass. Other maintenance activities are such as pruning is done with an intensity that is not fixed because this activity is done with the main objective to find firewood. Fertilization is sometimes done, but its main purpose is to cultivate crops and herb. Fertilization is usually only done 2 times, ie at the time of planting and 3 months after planting. While the tree thinning activities carried out with the primary objective is to get results, so the tree that selected for thinning is that have high economic value.

3. Hervesting

Harvesting or felling trees is usually done by traders after the transaction between farmers and traders. Community forest growers will sell the tree if they have an immediate need or a farmer requires a considerable amount of funds. The logging system is often known as “tebang butuh”. Farmers will choose a tree which when sold will be able to meet the immediate need and is quite large. For tree farmers considered the savings that will be used when having a big need. The branch of the trees is used for fuelwood while the timber is used for building materials.

b. Processing Sub System

Processing of the final product of community forest that been sold or used by the farmer. Based on observations and interviews with farmers in the form of community forest product processing conducted community forest growers in Gunungkidul is used for building materials and sold to the trader in standing stock. Logging activities carried out by traders because farmers do not have the infrastructure to cut the trees. The farmers sell the trees in standing stock. Processing activities have not been carried out by the farmers so that not a lot of added value derived from tree farmers from the community forest. Meanwhile, plantation crops and understory product has process by the farmer through drying using the sun so that the selling price could be higher than if sold in wet conditions. But not many farmers are doing these activities. It is because farmers need some funds in a quick time to meet daily needs.

c. Marketing sub system

Farmers do not sell forest products directly, but traders who visit the farmers to buy the wood, tree crops and herb. The trader will do all harvesting activities, for trees plantation and herb growers often do harvesting and sold at home instead of on land. However, some farmers also sell their crops or herb directly in the land with “tebasan” system. System of cash payments made after the agreement of the price. Mechanism that works is trader visit the farmers or farmers call traders then jointly look at the quantity and condition of goods to be sold and determine a mutually agreed price. Trader who is providing the highest offer that will make a deal with the farmer.

Some factors affecting the selling price are the location where the community forests are located. If the location is close to the access road, then usually the price will be more expensive because of its ease of access. In contrast to land located in a remote area, then usually the price will be lower because the trader requires additional labor and means of transport to take the goods. In addition to the location of the factors affecting the price is the quality and the size and physical condition.

3.2. Woman role in community forest management

The issue of gender equality in various fields has become one of the top priorities in the formulation of the Millennium Development Goals (MDGs). According Rahayu (2001) Women play an important role in various aspects of forest development. Gender issues should be enforced by way of identifying the processes and specific activities to facilitate women's participation as a partner in all phases of activities (planning, implementation, monitoring and evaluation).

Based on the results of focus group discussions, both with men and women know that there is division of roles between men and women in community forest management. FGDs were conducted separately between groups of men and women. This is done in order to avoid the intervention of the participant answers. Based on the results of the group discussions by women perception known that men still dominate forest management activities. Male dominance is especially shown in the following activities: (1) determine the types of trees to be planted, (2) planting trees, (3) maintain the trees, (4) cutting down trees; (5) determine the time of harvesting (6) cut trees (7) bargain price of timber to the trader; (8) farmer group meetings attending.

While women do not have the dominant role of the community forest management activities. Some of the activities carried out by women such as to determine the species of agricultural crops, and maintain and harvest the agricultural crops is done together with the men. According to the man perception of decision-making in community forest management activities carried out by men. While the role of women only help men manage community forests. Roles of men and women in community forest management according to the perception of women in both study sites in more detail can be seen in Table 1.

Division of roles between men and women as perceived by men is not much different from the perception by women. Activities and decision-making dominance exist in men. Differences that appear visible on some of the activities dominated by women in Katongan village are planting of agricultural crops, maintance the agricultural crops and determine time for cut the trees. In the Katongan village there is women farmer groups (Indonesia=Kelompok tani wanita/KTW) . One of the program of KTW is planting and maintenance of agricultural crops joined together in rotation among the members. This is why the role of women in the two activities is more dominant. The time for cutting trees in Katongan village is dominated by women because women know the financial situation in the family precisely. Trees in the community forest are one of saving that owned by farmers in Gunungkidul, so if they needed the money then the tree will be cut. However, before the decision to cut trees usually farmers will use other sources such as savings in the form of livestock. When all is not sufficient, then the tree is the last alternative. Detail the division of roles between men and women in community forest management according to the perception of men can be seen in Table 2.

Table 1: Women perception toward role of men and women on community forest management

Activities	Katongan village		Dengok village	
	Men (%)	Women (%)	Men (%)	Women (%)
1. Decide crops spesies	50	50	50	50
2. Decide trees spesies	100	0	50	50
3. Planting crops	50	50	50	50
4. Planting trees	90	10	90	10
5. Maintenance crops	50	50	50	50
6. Maintenance trees	100	0	100	0
7. Harvesting crops	50	50	50	50
8. Harvesting forest product	50	50	100	0
9. Decide time for cut the trees	50	50	100	0
10. Cut the trees	100	0	100	0
11. Bargaining with trader	80	20	100	0
12. Attending farmer group meeting	50	50	80	20

Source: Primary data, 2012

Table 2: Men perception toward role of men and women on community forest management

Activities	Katongan village		Dengok village	
	Men (%)	Women (%)	Men (%)	Women (%)
1. Decide crops spesies	50	50	75	25
2. Decide trees spesies	100	0	90	10
3. Planting crops	40	60	50	50
4. Planting trees	100	0	95	5
5. Maintenance crops	20	80	50	50
6. Maintenance trees	100	0	75	25
7. Harvesting crops	50	50	50	50
8. Harvesting forest product	80	20	100	0
9. Decide time for cut the trees	20	80	100	0
10. Cut the trees	100	0	100	0
11. Bargaining with trader	100	0	100	0
12. Attending farmer group meeting	90	10	50	50

Source: Primary data, 2012

Acording Gupte (2004) Women are still marginalized in decision making. This is evident from the findings that women's roles are still at the level of assist men in managing community forests. Decision-making is still dominated by men. Women are less able to participate because of the patron-client culture in Java that puts the role of men is higher than women. The domain of women role is in reproductive activities such as child care, house cleaning, cooking and other household chores.

The constraints that faced by women to be able to actively participate in community forest management arae:

1. Logistical constraints associated with woman's double work burdens: woman have no longer worksdays than men because of reproductive activities in the house.
2. Male bias: it is rarely woman be involved in decision making process such tree choice or micro-plans for community forest development
3. Social constraints: female seclusion practices, subtle disapproval of women's presence in public spaces; restrictive norms of appropriate female behavior and public interaction, social perception, articulated in various ways that women less capable than men
4. The absence of a critical mass of women. Women are often reluctant to attend meeting if they are only a few
5. Women's lack of recognized authority: many women find that when they do attend meeting their opinions are disregarded causing tem drop out.

In community foret managemetn, women's interest are linked more to the availability of fuel, fodder and non timber products for which they are more directly responsible and the depletion of which has meant ever-increasing workloads. Roles of men and women in community forest management in each area may vary. It is caused by socio-economic conditions of society and culture and norms prevailing in the community. Under these conditions, to improve the role of woman on community forest, it is important to analyze the social relations between men and women.

4 Conclusion

The research finding shows that according men and women perception, community forest management is dominated by men. Male dominance is especially shown in the following activities: (1) determine the types of trees to be planted, (2) planting trees, (3) maintain the trees, (4) cutting down trees; (5) determine the time of harvesting (6) cut trees (7) bargain price of timber to the trader; (8) farmer group meetings attending. While women do not have the dominant role of the community forest management activities. Some of the activities carried out by women such as to determine the species of agricultural crops, and maintain and harvest the agricultural crops is done together with the men. Based on the research finding, women empowering and increasing role of women in community forest is importance issue.

Acknowledgment

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[BS2-2]

Women and Non-Timber Forest Products (NTFPs) In Nepal

Mathura Khanal[1]

1 Introduction

Nepal occupies the central part of the Himalaya hence it provides a great variety of habitat which is colorfully reflected in the richness of flora and fauna. The diverse bio- physiographic, climatic and edaphic factors create a spectrum of micro environment with diverse biological and physical attributes creating niches for numerous species of flora and fauna. The various forest types ranging from tropical to alpine, supply timber, fodder and various Non-Timber Forest Products (NTFPs) and on the other indirect regular agricultural productivity, soil conservation, livestock improvement, wildlife protection, tourism promotion and finally a clue of environmental stability.

Biological resources are likely the key sources of energy in all forms consumed by human beings for their survival. Human being obtains food, medicine and range of other products from biodiversity. In Nepal, all goods and services for commercial, industrial or subsistence used derived from the forest and allied land uses, other than timber, fuel wood and fodder are considered as NTFPs. Every year 10,000-15,000 tons of NTFPs representing around 100 species are harvested from forest land in the mid-hills and high mountains of Nepal (Edwards, 1996). They are distributed in all the physiographic regions of the country. The distribution has been found approximately to be 31% in tropical and sub-tropical zones, 55% in temperate zone and 14% in alpine zone (Hara *et. al.*, 1978). For total Gross Domestic Product(GDP) of Nepal, Forestry sector gives 15% income with connection to the NTFPs which is about 45% of the forestry sector's contribution to the GDP (Edwards,1996). Forest resources contributing major sources of subsistence for poor forest dependent community and income linked to NTFPs. Forest is an integral part of the daily lives of the rural population of Nepal.

Generally most of the people living in the village areas do not have easy accessibility to modern commodities so that they have to rely upon forest plants as a substitute to their food supply in times of scarcity. Rural and indigenous women in particular intensively interact with natural resources, collecting raw materials and producing food, fuel and medicines in Nepal. They depend on the fruits, leaves and roots of the native plants such as *Phoenix humilis, Kalanchoe spathulata, Dioscorea bulbifera, Dioscorea deltoidea, Brassia butyrecea etc.* Women bear almost all responsibility for meeting basic need of the family, yet are systematically denied from the resources, information and freedom of action they need to fulfill the responsibility due to patriarchal society. Though, women are guardians of vast habitat with diverse flora and fauna. Women farmers are in fact been largely responsible for the improvement and adaptation of many plant varieties.

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The world forest biodiversity is threatened by deforestation, forest fragmentation and habitat degradation as well as decline in primary forest area and Nepal is no exception. Rural poverty, over population, urbanization and migration are the major challenges of forest degradation in Nepal. Most of the NTFP species subjected to over-exploitation are either disappeared or on the verge of extinction. Since last two decades commercial extraction of forest resources coupled with several other biotic factors, tends to led resources depletion *in situ*. Nepal's forest degradation has led to stagnant economic growth and extensive exploitation of valuable natural resources. Conservation and sustainable management of NTFPs, particularly commercially important resources are challenging task in government owned tropical forest in Nepal.

Before prescribing specific management tools to resource managers, adaptive research must be carried out (Karki, 2000). In Nepal, there have not been serious attempts for proper documentation of the use of medicinal and other useful plants. Besides that the indigenous people are under extreme pressure to change their way of thinking, decision-making and harvesting natural resources for livelihood due to rapidly increasing population, poverty and modernization. Most of the national level forest plans are focused on the tree and timber management plan only. The roles of the community and women in regard to conservation and domestication of rare gift of nature are ignored by the state. There is fear from the loss of the biodiversity; the medicinal plants represent an important component of it and consequently the loss of the traditional knowledge of the healers. Keeping all these important things in mind, this research was conducted.

2 Materials and Methods

This research was carried out in July 2011 to September 2012 in Rupandehi District, Saljhandi VDC-3, Panbari Village in Lumbini Zone, Nepal. The area is surrounded by the Kothiko Ban (Natural Government Forest) and Kanchan Community Forest (Plantation). I went directly to villagers by door to door visit to observe their day to day activities in relation with the forest resource utilization, domestication and commercial status. During this period, I became familiar with them and established the rapport which made me easier to obtain interesting information and to apply my selected methodologies. People were happy to lend me their time and knowledge. A representative sample reflects the actual characteristics of the population accurately and without bias. It is necessary to develop a sampling procedure that reduces sampling error to a tolerable and acceptable level. An attempt was made to follow all the steps and sampling procedure carefully in this study. The total 251 households of user community, living surrounding the forest is the target population for this research work. Sample was taken using systematic method of sampling for which sampling interval was calculated as: K= N/n; where, K= sample interval, N= total population and n= sample population.

First sample (n_1) was taken randomly. The next sample was taken as n_1+5. In my case the first sample was the first household from the list of ward office, second subsequently was 6 and similarly thereafter, results in total sample of 50 household from the village. In addition to the household respondents two local healers were also selected for the questionnaire survey. A group discussion with community forest users group was conducted to get more information about the conservation status of both forests. Semi-structured interviews with key informant, participant observation, private land observation, listing of NTFPs, photography, data storage and transformation and data analysis were conducted to complete the research work.

Figure 1: Group discussion

Figure 2: Private land observation

3 Results

The analysis begins with basic information of local resources in the study area and local pattern of domestication and utilization. The present study revealed more than 30 plant species having multiple values which are being used for different purposes by local users. However, study only focused on NTFPs having potentiality for contributing to the local economy and their significant role in subsistence farming system for their better livelihood. The results are presented in the form of table, diagram, figures and synthesized text.

Available NTFPs in the study area

This study found more than 100 species having multiple values which include shrubs and small herbal plants but the study focused on NTFPs which are possible to domesticate with market potentiality. Therefore, only 30 NTFPs are listed herewith to make the research effective.

Involvement of NTFPs collection from the forest

The research revealed that women in this area have less access to education, health services, credit facilities and productive employment opportunities and they have limited access to economic resources. According to the household survey 78% women used to go to the forest for NTFPs collection and only 22% males were found involved.

Table 1: Details of the NTFPs

Scientific Name	Status	Importance	Domestication	Economic Potentiality
Pterocarpus marsupium	Rare	Medicinal	No	High
Terminalia bellerica	Rare	Medicinal	No	Medium
Terminalia chebula	Rare	Medicinal	No	Medium
Phyllathus emblica	Few	Multiple	Few	High
Cassia Fistula	Few	Medicinal	Few	High
Aegle marmelos	Few	Multiple	Few	High
Azadirachta indica	Few	Medicinal	Yes	Low
Acacia catechu	Few	Medicinal	Yes	High
Vitex negundo	Few	Multiple	Yes	High
Madhuka indica	Few	Multiple	No	High
Eulaliopsis binata	Abundant	Multiple	Yes	High
Brassia butyraceae	Rare	Multiple	Yes	High
Phoenix indicum	Abundant	Multiple	No	High
Cinnamomum tamala	Few	Multiple	Few	High
Arundinaria Intermedia	Few	Multiple	Yes	High
Dandrocalmus strictus	Few	Multiple	Yes	High
Ban Aduwa (Local name)	Few	Multiple	Yes	Medium
Chini laharo (Local name)	Rare	Medicine	Yes	Medium
Piper longum	Abundant	Medicine	Yes	High
Kalanchoe spathulata	Abundant	Multiple	Yes	High
Thysanolaena maxima	Abundant	Multiple	Yes	High
Asparagus rasemosus	Abundant	Multiple	Yes	High
Aloe bzarbadenis,	Few	Medicine	Yes	High
Saccharum spontaneum	Few	Utensil	Yes	High
Bauhinia vahlii	Few	Multiple	No	High
Syzygium cumini	Abundant	Multiple	No	Medium
Achyranthes aspera	Abundant	Multiple	Yes	Medium
Dioscorea bulbifera	Abundant	Food	No	Medium
Dioscorea deltoidea	Abundant	Food	No	Medium
Morchella species	Abundant	Food	Not possible	High

Domestication of important NTFPs

Among listed NTFPs, which have market potentiality and are easy to cultivate within a small piece of land in short time span were found domesticated by the villagers. Among the 50 households' private land observation as per sampling method, 35 households have *Kalanchoe spathlata,* 30 have *Piper longum*, 29 have *Thysanolaena,*30 have *Asparagus* and 15 have *Arundinaria* in their private land.

Among them only 8 households are being involved in commercial cultivation of *Kalanchoe,* 7 in *Thysanolaena*, 8 in *Piper longum* only 5 in *Asparagus. Arundinaria* is used to prepare the leaf umbrella which can be sold to those neighbors who are unable to prepare themselves. Most of the other NTFPs specially the medicinal plants have been cultivated for their household uses and to send to their relatives who have long network in their family.

Diagram 1: Involvements in NTFPs collection

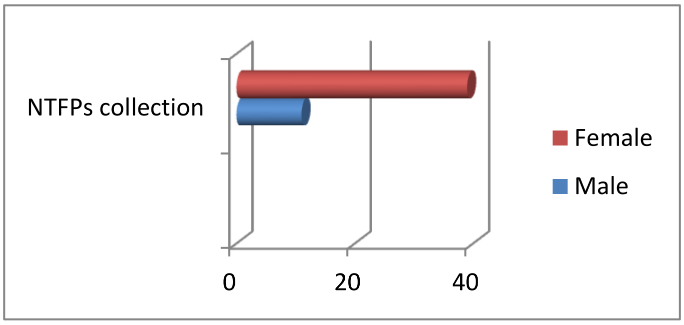


Diagram 2: Domestication of NTFPs

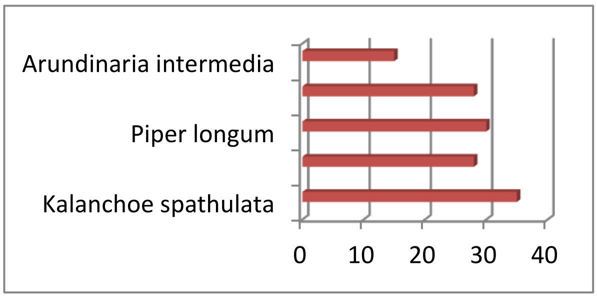
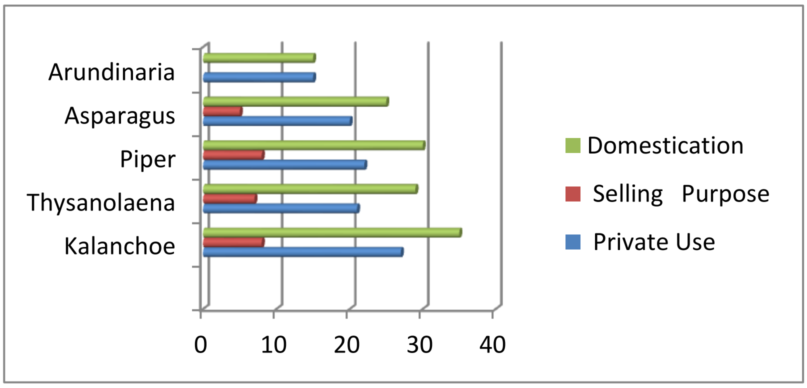


Figure 3: *Kalanchoe spathulata* domestication

Diagram 3: Purpose of domestication



Income from selling NTFPs

This study found farmers are not engaged in full scale business plan but they have just started to understand the value of cash income from a small scale trial of such NTFPs. Some cash income has been generated by the farmers who have started to sell some amount of NTFPs in nearby market and at house as well. The graph shows the income in 2012. *Kalanchoe spathulata* is very famous and gave higest income which is around 50,000/- per year to those farmers who have started to sell its root product. Broom from *Thysanolaena* occupied the second and *Piper* the third position which is below 10,000/- per year. *Asparagus* occupied the lowest position in income as it is used for tonic to their cattle to increase the milk production. *Arundinaria* is used to make leaf umbrella and domestic utensils which cost quite high.

Diagram 4 : Income from NTFPs

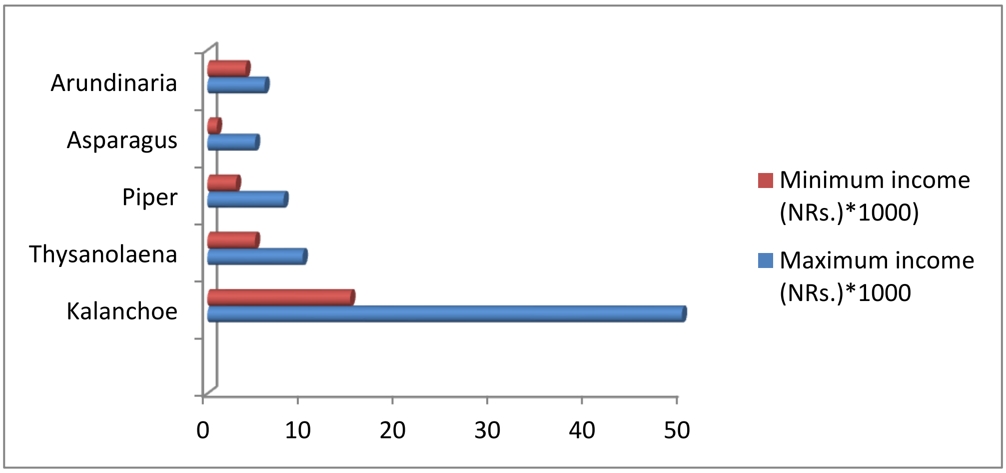


Figure 4: Root of *Kalanchoe*

Figure 5: Broom from *Thysanolaena*

Figure 6: Umbrella from *Bauhinia* leaves

Gender based involvement in NTFPs management

According to the household survey, in depth study and participant observation, 64% women were involved in domestication, management and selling activities of NTFPs and in remaining 36%, men and women were found involved. In most of the households, women especially widows and young women who have limited income from other sources were found involved to domesticate and manage plant species of their interest in their own land.

Diagram 5: Involvement in NTFPs management

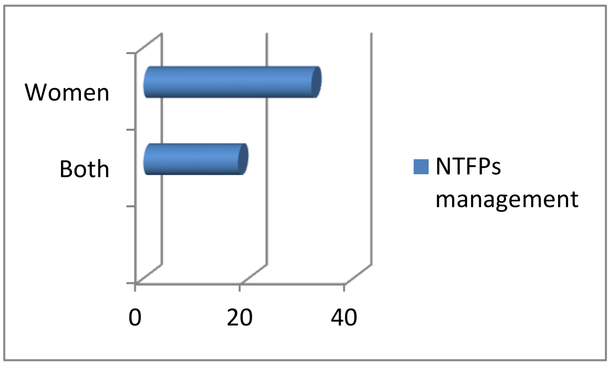
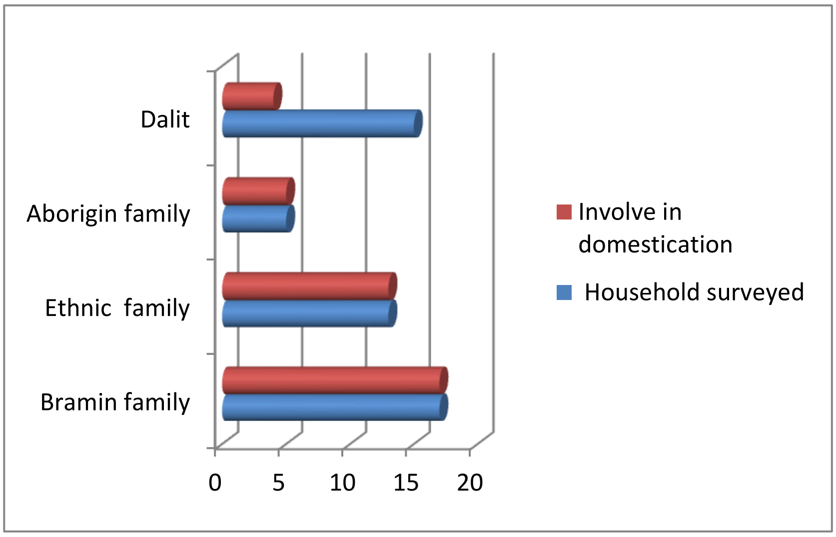


Figure 7: Women manage the NTFPs

Caste based involvement in NTFPs management

Study area has mixed settlement pattern. A large number of Brahmin family were found involved in domestication and management of NTFPs on their own land followed by ethnic group and aborigine people. Dalits were found having less interest in NTFPs management due to the insufficient private land as well as their traditional profession. However, poorest people of the community used to go to the forest to collect NTFPs for household use and selling purposes.

Diagram 6: Caste based involvement in NTFPs management



Motivation of people towards *Kalanchoe spathulata*

Based on their experience, local people have strong belief in *Kalanchoe spathulata*. They were found interested to cultivate in large scale if its value would be disseminated nationally and internationally. Following are the salient features of the plant:

- Magical experience in case of fracture joining.

- Large volume from small effort-two kg per plant per year.
- Easy to cultivate and management in marginal land.
- Multiple uses-medicines, fodder, fruit and fuel, manure.
- Increasing demand at high price in the market.
- Beautiful leafy plant increases the greenery of the site.
- Considered an important gift for relatives who have got fracture in accident.

Potentiality analysis for *Kalanchoe spathulata*

One ha. land area can produce 6000 plants at the distance of 1.25 m*1.25 m space. From one plant 2 kg root can be obtained which is sold in the market@ 500 NRs per kg. This way income 6000000 NRs per year can be made. The expenditures like land cost, compost manure, labor cost for plantation and harvesting can be covered within 300000 NRs. This assessment has been made in group discussion based on experience. The dissemination of its importance in other parts of the country and support from government side is essential for large scale production. It is necessary to find out the chemical constituents of the root extract.

4 Discussion

Plants are utmost interest to the human beings and our ancestors also lived on nuts, roots succulent stems, fruits and other parts of plants. Today, our existence can still not be imagined without plants. The Kothiko Ban (forest) was rich in biological diversity in the past. Unsustainable level of harvesting of valuable plant species, forest fire and overgrazing degraded the forest resulting the loss of important flora and fauna. Some of the senior local healers had started domestication of some useful plants as they did not have hospital facilities for minor to big health problems. They had great knowledge regarding the medicinal plants and practiced at local level. Most of the local healers did not pass the knowledge to new generation due to ignorance of the local treatments. Very few healers transferred the knowledge to their son. Presently very few local healers were found during my study period with vast knowledge and practices of plant species. Learning from these healers other people in the area started to domesticate commercially valued plant species as they are rare in the natural habitat. Study found that women from poor family have vast knowledge on plant species since they must go to the forest to collect needy things for their daily life. They have great association with such natural gifts in the forest and have started to domesticate. *Kalanchoe spathulata, Piper longum*, *Asparagus racemoses* and *Thysanulaena* have great potentiality for commercialization. Dalit people were found less interested in domestication of NTFPs. However, they depend on forest to collect mushroom, nuts, fruits, leaves, vegetables, honey and other essential goods. There seems great potential of regenerating valued plant species in the natural habitat due to changing profession of the local youths and community forestry program.

5 Conclusion

The present study indicates that Kothiko Ban, Kanchan Community forest and Panbari village area harbor a high diversity of useful plants species. Despite gradual socio-cultural transformation, the inhabitants have remarkable knowledge of plants and their uses. NTFPs have been playing crucial role in the livelihood of subsistence farmers in the area. People were found rely on plant based medicine for the primary health care. The magical effectiveness of *Kalanchoe* in case of bone fracture gains the positive response to domestication of it and other important plant species by the villagers. The popularity of this rare medicinal plant was found only in this area. Similarly *Asparagus, Piper* and *Thysanolaena* are playing important role in the economic enhancement of the farmers specially the poor, women and widows in the area. The domestication of some important plant species found quite few in Dalit families, however, they rely on NTFPs available in the forest area near the settlement. This study found income from NTFPs is much more than forest products and agricultural products from small efforts. The government of Nepal should encourage and support to the farmers for the large scale production of such NTFPs in days to come. It is essential to find out the chemical ingredient of the root product of *Kalanchoe spathulata* for the benefit of the mankind in future.

Figure 8: Learn from mother

Figure 9: Economic suppport from *Kalanchoe*

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Possibilities and problems of community-based forestry in the mountainous areas of Japan

A case study in Yasaka of Hamada City in Shimane Prefecture

Maki Fukushima[1]

1 Introduction

Forest resources were important for people in rural areas of Japan, not only as sources for wood fuels and agricultural fertilizer but also as a source of income. People's use of forested lands in rural areas was governed by the customary rules. However, rural life in Japan has changed rapidly since the 1960s. Fuel wood was replaced by petroleum oil and gas as a source of fuel, and chemical fertilizer replaced fertilizers from forested lands. In addition, due to the globalization of the forest-products market and the increasing foreign share of forest products, demand for domestic forest products has decreased. As a result, forests used for wood fuels in rural areas have been abandoned and silvicultural activities, such as thinning and pruning in commercial timber plantations, have been halted.

These changes in lifestyle in rural areas and also in the structure of the forest-products market created a fundamental problem for the relationship between people living in rural areas and rural forests; the lives of rural populations are no longer necessarily related to the forests. This situation brought another problem: it is difficult to recognize the role of forests in rural areas and develop policies for their management. This paper discusses the actual condition of forest management for people in mountainous areas and their ideas about forests, in order to determine an outlook for a better relationship between people and forests in Japan.

2 Research areas and methods

The study site is located in the western part of Shimane Prefecture, Japan. Until the 19th century, timber from the mountainous areas of the Shimane Prefecture was largely used for charcoal for manual iron-making. In the early 20th century, the modern method of iron-making was introduced to Japan and the traditional, manual style of iron-making gradually declined (Sugiura 1971). As a result, charcoal was directly sold to urban areas for daily household use. After charcoal production for urban area declined in the 1960s, with the liberalization of the petroleum oil market, timber in Shimane Prefecture was largely used for the production of Chinese mushrooms or directly sold as raw material

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for pulp and paper manufacturing. However, these forest products were also eventually replaced by imported goods. Furthermore, petroleum oil and gas became common in rural areas as well as urban areas of Japan. Rural populations in Shimane Prefecture started to plant cash timber such as Sugi and Hinoki in places that were no longer needed to grow timber for fuel and agricultural fertilizers. However, after lumber imports were liberalized in the 1960s, the demand for domestic lumber fell and the price of lumber declined by the 1980s.

Our study site, the village of Yasaka, experienced the same history. The population of Yasaka was around 5,000 through the 1950s, but it rapidly declined to under 3,000 people in the 1960s. The population continued to decline into the present day; in 2010, the population was only 1,492 people. Of the people in Yasaka, 43% are over 65 years old. There are 27 communities in Yasaka. These communities were formerly natural villages, consolidated into two administrative villages in 1922. The two administrative villages, Kitsuka village and Yasugi village, were consolidated into Yasaka village in 1965.

We focused on the Osaka community, one of the 27 communities in Yasaka, because this is the only community to have a community forest and a community-based forestry cooperative, Seisan-Shinrin-Kumiai. From April 2009 to March 2012, the author was a researcher in a community development project and lived in a neighboring community. Therefore, the author maintained contact and communication with people in the Osaka community on a daily basis.

The author also investigated historical documents of the Osaka community forest and conducted participant observation and interviews with several persons in the Osaka community in order to clarify the historical changes in the relationship between people and forest as well as to document people’s ideas about their forests.

3 Result and discussion

3.1 History of the assertion of the right to possess community forests

After the land tax reform in 1873, private ownership of land was legalized in Japan. If villagers could provide valid reasons for possessing the land, the village received the certification of land title. Otherwise, as was frequently the case, the land was made part of the national lands (Nakao 2009). However, there were more than a few cases in which villagers did not claim the right to possess the land until after the municipality system was legalized, and natural villages were regrouped into administrative villages, in 1898.

Members of the Osaka community registered their forested land in the community’s name in 1912, but soon reregistered the land in the name of a few representative individuals. The reason why they reregistered the land may be that the Japanese government tried to carry out a policy measurement to put the communities’ forested lands into the national lands or under state control (Kasahara 1998). It was suggested that the people of the Osaka community use their forest according to their customary rules, independent of those individuals under whose names the forest was registered.

During the Second World War, excessive use degraded large areas of forested land in Japan. After the war, the government initiated a policy to put forested land once again back under state control. A document retained by the Osaka community shows how residents dealt with the situation. In April 1947, people from the Osaka community held an emergency meeting in which they decided to change the registered name of community's forested land over to the names of 25 residents who possessed smaller forested lands, all less than one ha, which reduced the amount of forested land possessed by each person. This record also suggests that people in the Osaka community used their community forest independently of the registered individuals, and that there were strong customary rules governing the use of their community forest.

Until the 1960s, forest resources, such as firewood and fertilizer, were important for the daily life and agricultural practices of the Osaka community. They also planted commercial timber, such as Sugi and Hinoki, for future generations. As the use of gas and electricity increased, they extended their Sugi and Hinoki plantation into the abandoned areas previously used for wood fuels. In order to receive subsidies to engage in plantation activities more efficiently and also to clarify the ownership of the community forest, members of the Osaka community established a community-based forestry cooperative (Seisan-Shinrin-Kumiai). The government also supported plantation activities by providing subsidies and encouraging communities to establish forestry cooperatives in order to define the ownership of the forested lands traditionally used by rural communities.

3.2 Silvicultural activities and financial conditions of the forestry cooperative

Before they established a forestry cooperative, people in the Osaka community planted a 12 ha Sugi and Hinoki plantation. After they established their community-based forestry cooperative in 1973, they expanded the plantation area to 87 ha, 71 ha of which was a cooperative managed by a public forestry company and local authorities. The plantation made up 54% of total area of the community forest, with the other area remaining a natural broad-leaf forest.

However, during the period of high economy growth, which started in the late 1950s, the rapid industrialization of urban areas increased the demand for labor. Many young people moved to urban areas in order to find jobs. In addition, lumber prices decreased and the demand for domestic forest resources fell during the 1980s. As a result, people in the Osaka community gradually abandoned silvicultural activities before completely finishing the final thinning.

The last record of a sale of a plantation tree in Osaka was in 1994. They did not distribute money to individuals, but used it for repairing the roof of their shrine. Cooperative thinning activities were stopped in 1998. According to the financial statement of the 2011-2012 year, the only regular income from community forest was a rent payment from an electric company for the use of a site for a power pole.

In order to keep their community-based forestry cooperative a legal entity, they needed not only to pay corporate inhabitant and property tax, but also to commission a financial condition statement from a tax accountant, which would cost approximately 80,000-100,000 yen. As a result, the accounts of forest cooperatives are often supplemented by those of neighborhood community associations, which raised funds from monthly community fees and other sources.

3.3 Community members' ideas about the community forest and forestry cooperative

Even though they stopped collaborative thinning activities, community members continued to mow grass and clear the trail to the shrine located on a mountain summit within the forest once a year. These activities suggest that people of the Osaka community still see the forest as a source of inspiration and awe, inspiration that keeps them connected to the forest.

However, people in the Osaka community feel burdened by the cost of maintaining the forestry cooperative. Several individuals in Osaka say that it would be difficult to maintain the forestry cooperative in the future. On the other hand, one man in Osaka, who was in charge when the Osaka community sold trees in 1994, says that it is necessary to continually produce financial statements so that they are ready for the future opportunities to sell lumber. He also emphasized that trees planted on the plantation in the 1950s and the early 1960s were well managed in the past and currently have economic value.

In fact, members of the Osaka community paid for the installation of public facilities, such as plumbing and telephone lines, with income from the sale of lumber from community forest; as a result they still believe it is unnecessary for individuals to pay for the maintenance of public facilities. Moreover, the water for a paddy field in Osaka totally depends on the water supply of the surrounding mountains, 32% of which originates in the community forest. The inspiration and awe people feel towards the forest may, at an unconscious level, be connected to the importance of mountains and their water supply.

If members of the forestry cooperative hope to receive dividends from the community forest in the future, a corporate body such as the forestry cooperative (Seisan-shinrin-kumiai) may not only be useful but also in compliance with the law. However, the belief, held by many in the Osaka community, that they gain from keeping the community forest public, seems to be persistent. In this case, the cost to maintain the forestry cooperative organization is high for the members.

4 Conclusion

A recent study of the forestry industry in Japan noted that the depression of forestry was caused not only by a decrease in lumber prices but also by an increase in labor costs (Kuris 1999). In this situation, forest owners needed to conduct silvicultural activities by themselves in order increase their earnings from lumber sales, because, if they entrusted silvicultural activities to professionals, any earnings would be offset by labor costs. This may also be true in the case of forestry cooperatives. From such a perspective, there may be a useful aspect to the legal identity of the forest cooperative (Seisan-Shinrin-Kumiai), because the members can be compensated through the distributions of dividends. However, the cost of maintaining Seisan-Shinrin-Kumiai is not appropriate to the forestry situation in Japan. Reducing the burden of taxes and financial procedures is necessary.

In Japan, the number of communities which have dissolved forestry cooperatives is increasing, with many of them handing their community forest over to neighboring associations approved by the local autonomy act. However, when the neighboring association earns money from the forest, members of that association are restricted to the distribution of dividends. In order to examine the appropriate types of legal entities, it is important to consider who will actually conduct the silvicultural activities.

The tendency for young people in mountainous areas to move into cities continues. People in mountainous areas carry out many activities, such as mowing grass around their paddy fields and roads, in addition to their normal work. Thus, they usually do not have enough time to care for their forest. However, considering that their forest is an important source of water for rice cultivation, it is necessary to reevaluate the importance of their forest and the necessity of keeping it under their control. The active involvement of researchers is necessary and helpful for the reevaluation of the role the forest plays, and for the consideration of better forestry management by people living in mountainous areas.

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Challenges of Forestry Practice Planners in sustainable management of Japanese non-industry family forestlands

Takanobu AIKAWA[1] and Satoshi HAYASE[2]

1 Introduction

1.1 Small NIPF owners and management exceeding their property boundaries

In many countries, huge area of forest land is owned by private owners that contains a lot of non-industrial private forest (NIPF) owners: USA (Kittredge, 2005), European countries (Schmithüsen & Hirisch, 2010) and so on. Importance of NIPF on sustainable forest management has been acknowledged in several studies as well as political processes (Schmithüsen and Hirsch, 2010).

In those fragmented forest assets, ideal design of forest roads construction on scales that exceed individual property boundaries provides fundamental condition to realize economically efficient timber production (Sedlak, 1996). Moreover grouping various owners' forests at a landscape scale can contribute for an effective management unit in fragmented landscapes, to realize other non-wood ecosystem services (Kitrredge, 2005).

Therefore, various cooperative approaches have been attempted in several countries especially where fragmented area is dominant or transferring to next generation has been proceeding (Kittredge, 2005). Land consolidation is one of the most fundamental solutions that have been conducted in European countries (Vitikainen, 2004). However, effective instruments for each country should be tailored, reflecting legal framework and socio-economic conditions.

1.2 Role of professionals and education and training in changing society

The success of promoting sustainable forest management eventually rests on a better understanding of the landowners and forestry professionals (Pregernig, 2001). Several recent studies have shown that forestry professionals could make an influence on forest owner's decision making (Hujala, Pykäläinen, & Tikkanen, 2007; Pregernig, 2001; Primmer & Karppinen, 2010). Moreover in some countries, forestry professionals hired by forest owners association have been playing important role to manage forests of various owners in a landscape level through providing advice services (Mendes et al.2006; Kittredge, 2005).

In many countries it had been very common that those experts are required relevant education and training in universities or colleges. Those educational institutions have been providing both

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academic rigor and relevance to the managerial and social duties of a professional (Brown, 2003).

On the other hands, the increasing ecosystem values and social structure changes require new way for natural resource managers to understand and relate to their professional roles and responsibilities (Kennedy & Koch, 2004). For the forestry sector, education and training has been also facing significant changes all over the world (Nair, 2004), including USA (O'Hara & Redelsheimer, 2012), Australia (Vanclay, 2007), UK (Leslie, Wilson, & Starr, 2006), and other European countries (Schmidt & Network, 2007). Moreover it would be worth noting that general competencies such as analysis & synthesis, problem solving, communication and business management have been regarded as important besides of traditional specific forestry competencies (Arevalo, Pitkänen, Gritten, & Tahvanainen, 2010; Vanclay, 2007).

In addition to the educational institutes, professional associations have been playing important roles to develop professionals and control their qualities by setting membership standards or operating certification schemes. Those organizations are active in USA, UK, Canada, New Zealand and Australia, and have been providing continuing professional development (CPD) programs that were effective to update their members' skills and knowledge.

1.3 Japanese forest management situation where fragmented NIPF owners are dominant

Japanese 14million ha of plantation forestlands, including production forests are mainly owned by NIPF owners. Many of these are plantation forests that were planted in the 1960-70's using subsidies. Thinning is most important silvicultural works for those age's plantations in Japan, but most of them has been managed behind proper thinning schedule.

This is because low profitability due to the fallen log prices with high operational costs. Forest owners having small size parcels are losing their interests in their forest management, and the owners' aging have progressed, some of them as well as their successors do not know even their exact boundaries of their forest (Matsushita & Taguchi, 2010).

High operational cost is related to poor forest road network that is the most important infrastructure for forestry practices. European countries had invested heavily on forest road network in 1960-70's and achieved enough densities, for example 89m/hectare in Austria and 118m/hectare in Germany. However, the density of roads in Japan is only 17m/hectare due to steep inclination and the fragmented ownership structure (Japanese Forestry Agency, 2010).

To overcome those Japanese disadvantaged conditions, it is expected that professions called as "Forestry Practice Planners (FPP)" can carry out "forestry practice consolidation (FPC)" that means doing both thinning and road construction in a certain forest area owned by various owners. Please note that consolidation doesn't mean "land consolidation", but just "forestry practice" where road network could be build across various owners' properties.

Since 2009, the policy target of Japanese Forestry Agency (JFA) has been focused on realizing the target as increasing the timber self-sufficiency ratio to 50% in 2020, and FPC has been regarded as a key strategy to realize the national target. While the timber production oriented target might be criticized as old-fashioned and narrow scoping, it could be understandable in the sense of domestic forest utilization considering increasing global wood demand (Norton & Aikawa, 2012).

1.4 Objects of this study

In order to develop FPPs and promote FPCs, several training programs have been organized by various organizations with funding of JFA since 2007. Those programs were designed for professionals in active service to learn not only the methodology of FPC but also principles of forest management, because Japan had been lacking such a vocational education and training system in many disciplines including forestry.

As the trainings are intentionally limited to two or three weeks so that they can participate, they must be evaluated whether they can learn relevant knowledge and skills. However, few studies have been conducted about the relevance of training programs for FPPs.

Moreover, the outcomes of the training initiatives remain unclear, while some case studies already reported FPPs' efforts on FPC (eg. Gendairingyo 2013). Additional barriers to conduct FPC might have to be considered, whether they are either inside or outside of enterprises for which FPPs worked for. For example, FPC could be a new business for most of forestry enterprises (Fujino 2009), FPPs would have to act as "intrapreneurs" in their organizations. Moreover, Japanese problematic forest land tenure management system (Matsushita & Taguchi, 2010) could prevent FPPs activities, considering the previous study's findings that enterprise development depends on the security and transferability of property rights (Bouriaud, 2007).

Therefore, this study was conducted to attain following objectives for further policy development;

- To describe the overview of FPP developing policy and characteristics of training programs
- To point out future challenges and trying to make evaluation and some recommendation

2 Methods

Since 2007, the training program for FPPs has been mainly organized by National Federation of Forest Owners' Cooperative Association Japan (NFFOCAJ) with supporting fund by JFA. After that, many prefecture governments began to provide follow-up training seminars. In 2012, to operate certification system for planners, Japanese Association of Forestry Practice Planners (JAFPP) was established. The authors have been engaged in those initiatives as a committee member and a secretariat, respectively.

For this study, published materials were gathered from JFA, NFFOCAJ and JAFPP to review and analyze the FPP developing policy and training program. Moreover, certified FPPs' needs of future opportunities to develop them-selves were also analyzed with both a survey conducted by JAFPP and a group interview with 6 certified FPPs held on July 2013.

3 Results

3.1 FPP development policy by Japanese Forestry Agency

Although the importance of consolidation had been recognized for a long time, the methodology had been poorly developed in Japan, whether it means “land consolidation” or “practice consolidation”. Around 1995, Hiyoshi Forest Owners Cooperative in Kyoto Prefecture developed original method of FPC by them-selves and succeeded in expanding managed forests area in their town.

Their method was innovative for Japanese forestry sector in following points; 1) showing transparent cost and income estimation to owners, 2) showing the importance of ideal road construction design to realize cost effective timber production from thinning. Moreover, the procedure was so standardized to spread among other enterprises that JFA adopted its method after analyzing and launched training programs in 2007.

In 2009 Japanese Ministry of Agriculture, Forestry and Fisheries (MAFF) developed the “Forest and Forestry Revitalization Plan (FFRP)”, as a part of a national economic initiative that was created by a new cabinet of the Democratic Party of Japan. The plan aimed to realize a target rate of wood self-sufficiency of more than 50%. The target is still valid, after the Liberal Democratic Party of Japan came back to the power in 2012.

In order to realize the target of FFRP, five committees were organized to discuss each specific issue. Policy options for upbringing FPPs were discussed in both the human resource development committee and the reforming FOCs committee. The two committees approved the target as 2,100 trained FPPs by 2015, and also pointed that it was essential to provide continuing professional development (CPD) program even if they are certified. According to the recommendation of the committees, JAFPP was established in 2012 to operate a certification system that requires both exams and CPDs.

3.2 FPP in new governance framework after FFRP

In Japan, advising services for NIPF owners have been provided by both public and private sectors: In addition to the stuffs in FOCs, prefecture extension specialists had been main service providers. After the FFRP discussions, JFA decided to launch retraining program and renew national exam system of extension specialists. Although the reform was inspired by Western countries’ “forester” systems, the name of the new title was decided to “Senior Forest Management Advisor (SFMA)” at last.

Within the new governance framework, SFMAs are expected to support municipalities to develop their “Master Plan of Forest Management”, while FPPs provide services as consultants for forest owners to prepare forest management plans for their private forest lands (Figure 1). The Master Plan will play an important role as a guideline for estate’s management plans that are mainly developed by FPPs as results of FPC processes (Aikawa, 2012).

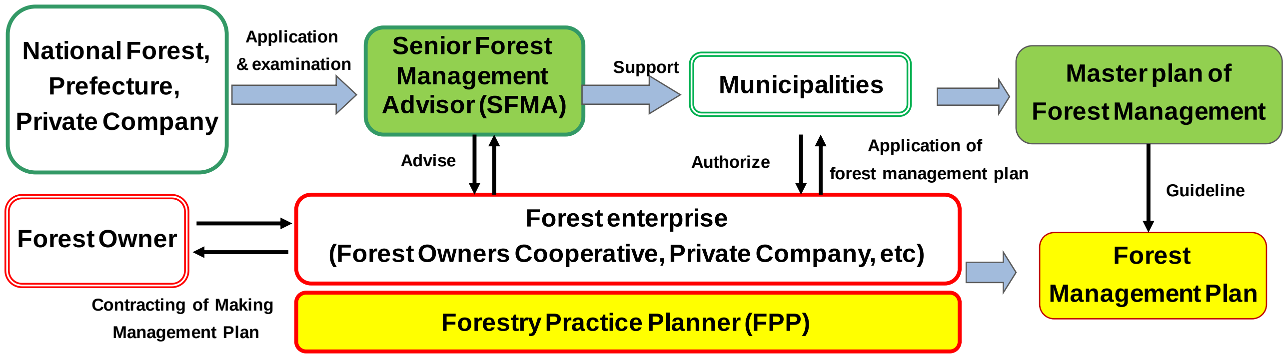

Figure 1: New Governance Framework after the Revitalization Plan

Source: Japanese Forest Agency (English translation by the authors)

3.3 Training programs

Table 1 shows the basic curriculum of the training program. In two or three week courses, trainees learn basic knowledge and skills necessary for conducting FPC. Silviculture, road construction and cost calculation are essential subjects, while knowledge on non-timber forest ecosystem services such as biodiversity, is not fully provided because of time limitation. Business management skill like cost management was one of the most welcomed subjects among trainees, because most of them haven't learnt relevant cost calculation method ever. Group workshops and discussions are regarded as important to develop communication skill that is one of the most important competences for FPPs.

Table 1: Standard curricula of FPPs training program

Theme	Method
Planning and proposal	
Significance of forest consolidation	Lecture, Case study
Forest management plan	Explanation by prefecture government
Grand design of consolidated area and developing proposal	Workshop in forest. Case study
Consensus buildings with forest owners	Lecture, Workshop on communication skill
Timber sales marketing	Lecture
Forest Practice	
Target forest structure and silviculture	Lecture, Exercise in forest
Commercial thinning with forest machine	Lecture, Workshop in forest
Road construction	Lecture, Workshop in forest
Management of working procedures	Case study
Business management	
Cost management for commercial thinning	Lecture, Exercises in cost calculation
Tips for consolidation process	Case study, Croup workshop
Safety	
Safety for forest practice	Lecture

Source: Guidebook for organizing FPPs training seminar (NFFOCAJ 2012)

By the end of FY2012, more than 1,000 people have participated in basic training course, and 231 people also joined the second year's follow-up program (Table 2). Majority of trainees were from FOCs, while the ratio of stuffs from private companies was about only 10%. In response to the requests from participants, managers of each enterprise with accountants and leaders of workers have been recommended to attend the second year's follow up since 2008. These team based participations have been contributing to encourage forestry enterprises to launch FPC.

Table 2: Standard curricula of FPPs training program

	Forestry Owners' Cooperative	Private Forestry Company	Others*	Total
Basic course	881	117	71	1,069
Follow up course	206	25	-	231

Note: Others includes stuffs belonging to prefectures or prefecture association of FOCs
Source: NFFOCAJ

3.4 Certification for FPP

During the discussion of FFRP, the human resource development committee concluded that quality control of FPP is needed to promote FPC as an important national policy. According to this, JAFPP launched a certification system for FPP in 2012.

Sometimes much confusing usages are observed, but there are three types of credentialing approaches used by public and private entities: certification, registration and licensing (Society of American Foresters, 2001). According to their definition, FPP's scheme can be regarded as a certification, because it is voluntary and operated by non-governmental organization, whereas credentialing for SFMAs will a kind of registration in the sense that the scheme is operated by

Table 3: Characteristics of two types of foresters in Japan

	Senior Forest Management Advisor (SFMA)	Forestry Practice Planner (FPP)
Main client	Municipalities	Forest owners
Function	Supporting to prepare master plan of forest management as well as implement it	Consulting to prepare forest management plan with grouping owners
Employer	Prefecture, Forest Agency, Private company	Forest enterprise, forest owner cooperative
Training provider	Forest Agency	Federation of forest owners association, Prefecture
Qualification type	Registration	Certification
Qualification provider	Forest Agency	Japanese Association of Forestry Practice Planners (JAFFP)
Examination	Written exam, essay, interview about working experiences	Written exam, essay, interview about working experiences
CPD	Yes	Yes
Political target	2,000 -3,000 (by 2020)	2,100 (by 2015)

government to guarantee competency for a particular practice (supporting master plan of municipalities) (Table 3).

In May 2013, after written examination (multiple choice questions), essay and interview about working experiences, 393 people were certified as "Certified FPPs": 347 people are employed by FOCs, while 46 belong to private forestry companies, respectively. According to the comments from interviewers, even if they passed the exams, relevant communication skill with which they could explain their work experiences have to be strengthened further.

3.5 Development of CPD scheme by JAFFP

JAFPP is currently developing CPD program for Certified FPPs so that they can fit themselves for more reliable planners to their client forest owners as well as local communities. CPD for FPPs were proposed by FFRP committees at first, interviewers of certification exam also pointed out that even certificated planner have to learn further. Therefore development of CPD is one of the most important tasks for JAFFP.

Table 4 shows the needs for CPD that obtained by JAFFP's survey for certified planners. This result indicates that certified FPPs are keen to learn further knowledge and skills and interested in networking and exchanging their experiences with other FPPs, or that they don't have enough confidence with their performances. In addition to those specific competences, general competence such as communication and presentation is recognized as important.

Table 4: Summary of needs for CPD of certified FPPs

Training seminars	Road construction
	Business skills (Proposal document, management)
	Presentation, communication
Networking	Local meetings
	Workshop for certified FPPs
	Competition of proposal documents
	Workshop with SFMAs
Educational materials	Advanced textbook
	Good practice guide
	Translation of forester textbook in other countries

Source: JAFPP

4 Discussion

4.1 Knowledge,skills and competence for the relevant FPP

In many countries, it has been very common forest professionals were required relevant education and training in universities or colleges where silviculture or forest ecology has been regarded as a core competence. On the country, a recent study showed that a lot of managers of enterprises have strong needs for generic competencies such as management skills and marketing and presentation skills as well as subject-specific competence (Arevalo et al., 2010; Vanclay, 2007).

As there have been lack in such a vocational education and training system in many disciplines including forestry in Japan, JFA adopted a strategy of launching reeducation and retraining program to develop relevant professional. More than 1,000 people participated in basic training course during these 6 years, and 339 were certified in 2013. Those initiatives could be evaluated as the first reeducating and retraining opportunities for most of Japanese forestry professionals to learn comprehensively from basic forestry competence (eg. silviculture and road construction) to business skills (eg. cost estimation, communication).

However, further trainings are needed because the programs are intentionally limited to two or three weeks so that professionals in active service can participate. Although there are little differences in the views between external experts and FPPs themselves, further trainings for most of core competencies (eg. silviculture, road construction, communication) are inevitable.

As all vocational training systems can take full advantage of workplace learning (Hoeckel, Field, & Grubb, 2009). It would be applicable for the FPPs' CPD, because most of core competencies are difficult to learn without field experiences. Therefore, even for the certified FPPs, further on the job trainings combined with knowledge and field experiences will be needed.

Although deliberate discussion is now done to develop relevant CPD programs, the key concept should be self-assessment based and mutural-learning, but top-down traditional “teaching”model. Participation to the CPD of local educational and research institutes could enhance collaboration of academicians and practitioners.

4.2 Why don't FPPs take any actions?: Barriers for FPC and policy recommendation

FPC could be as a new business for most of forestry enterprises (Fujino 2009), FPPs would have to act as “intrapreneurs”. According to the framework developed by Kirkpatrick (1975), the training seminar have to be evaluated by four levels: reaction, learning, behavior and results. For the FPPs training case, there would be a barrier between “learning” and “behavior”. If it is true, the seminar programs have to be amended so that FPPs could change their behavior and take relevant action to conduct FPC works.

In addition to such inter-barriers, there are serious outer-barriers. In Japan, the fact that land tenure and forest information system that has a critical deficit could prevent enterprise development (Bouriaud, 2007). Some case studies showed that municipalities help could play a key role not only to facilitate owners grouping but also to overcome their problematic land tenure conditions proactively (Gendairingyo, 2013). Moreover, it would also be helpful for SFMAs to assist forest enterprises whether they are FOCs or private companies. From the viewpoints of training FPPs, communication skill to facilitate cooperation with those local authorities need to be strengthen.

Therefore, comprehensive studies with relevant framework are needed to understand the outcome of reeducation and retraining programs. And detected barriers have to be removed within the policy review process.

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[BS2-5]

The prototype of the business model that the Japanese forestry is going to realize

A Case Study of Forestry Owner's Cooperative of Hiyoshi town in Kyoto Prefecture

Masaya FUJINO[1]

1 Introduction

1.1 Objective of study

Due to the distributed small-scale ownership pattern of private forests in Japan, weeding labor and tree thinning has been performed by every single compartment separately. Therefore, in order to improve productivity, it is important to perform such works at the same period in multiple adjacent compartments as well as to achieve economies of scale of lumber production by establishing work roads and using forestry machines. In particular, it is important to realize such environment that makes it possible to work together at the same period in multiple compartments by having contracts between various forestry owners.

Addressing this problem, Hiyoshi town Forestry Owner's Cooperative (FOC) in Kyoto has systematized the results into an approach called "Forestry Practice Proposal". Along with its dissemination based on workshops which were launched six years ago led by Forestry Agency, Forestry Practice Proposal has also become one of private forest policies which are currently promoted by the agency. Although many forestry companies have sought for the way to work on Forestry Practice Proposal, the amount of lumbers produced in the course of such efforts is not so large.

Objective of the study is to analyze a business model for Forestry Practice Proposal executed by Hiyoshi town FOC to demonstrate the differences between other FOCs which are expected to become leaders of Forest Practice Proposal as well as to examine a method for other FOCs to shift their business models.

1.2 Methods of analysis

Business model refers to such model that shows business strategy and earnings structure regarding products and services to generate profits. Studies on business model are classified roughly into two groups; a study on definitions of business models and another to apply such definitions to actual corporation activities for analyzing such activities.

Literatures frequently cited in previous studies include those reported by Timmers(1998), Afuha(2003), Kim & Mauborgne(2005), Morris et al(2005), Chesbrough(2006), Johnson et al(2008),

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Johnson(2010). As for a definition of a business model, "a framework of making money" defined by Afuha (2003) is simple one. Among the studies having excellent aspects respectively, "Business Model Canvas" suggested by Osterwalder & Pigneur (2010) is superior as an empirical tool for analysis of corporate activities. Osterwalder & Pigneur (2010) have classified components of business model into four areas (customer, value proposition, infrastructure and funds) and nine structural blocks (1. Customer Segments, 2. Value Propositions, 3. Channels, 4. Customer Relationships, 5. Revenue Streams, 6. Key Resources 7. Key Activities 8. Key Partners, 9. Cost Structure). Even though each component itself has been advocated in existing studies, relationship between them has not been clearly referred to in those studies. Therefore, Osterwalder & Pigneur (2010) have clarified the relationships between each component and suggested a method to show the respective relationships by a diagram (Fig. 1).

Business Model Canvas is believed to have significantly high adaptability to corporate activity analysis in consideration of the fact that it has been formed based on repeated discussion by a lot of researchers and practical persons. Therefore, I have decided to apply it to this study as an analysis method.

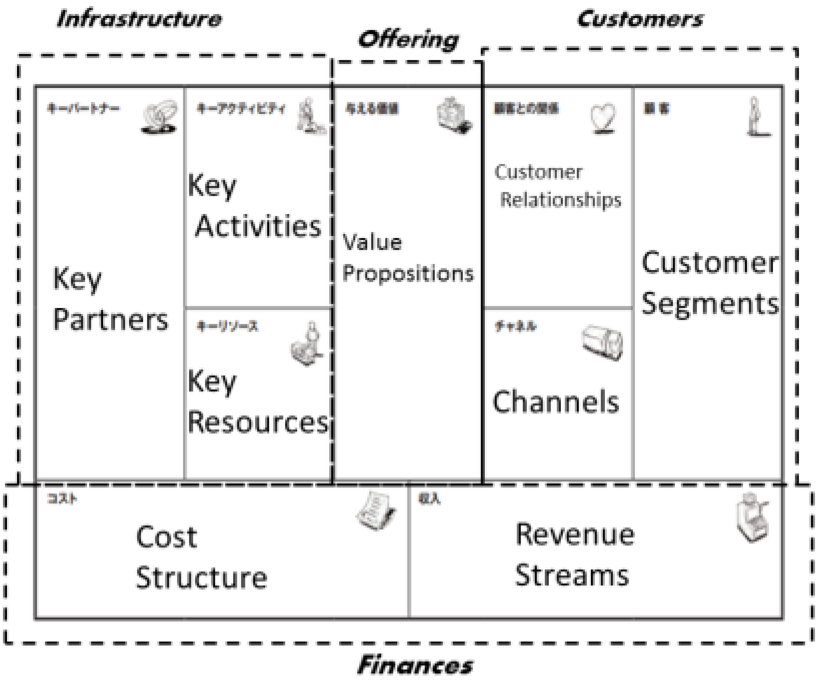

Figure 1: Business Model Canvas (retouched)
Source: http://businessmodelgeneration.com/canvas

1.3 Previous studies regarding Forestry Owner's Cooperatives in Japan

In addition to a lot of studies on forestry management by forestry owners conducted by many researchers such as Sato (1991) and Nezu (2012), studies focused on management of FOCs include those conducted by Kurotaki (1998) and Yukutake (1988) in Japan. However, such studies that have focused on business model or economic profile are limited to those conducted by Fujino (2009), Tsuzuki (2012), etc.

2 Analysis of Present State

2.1 Transition of Postwar Forestry in Japan

With two thirds of its national land covered by forests in Japan, 40% of them have been artificially regenerated. Most of them are conifers, such as cedars and cypresses, which have been planted after natural forests of broad leaved trees were clear-cut logged in the wake of the end of the World War II (since 1945).

Due to its warm climate with high rainfall, understory vegetation exhibits a luxuriant development in Japan. Therefore, weeding labor is required in summer annually for about a decade after planting. In addition, repeated tree thinning is also necessary in order to prevent tree crowns from growing thickly as well as to enhance the growth of targeted trees. These are called as tending operations which were often performed by forest owners themselves. However, subcontracting of such operations to FOCs and forestry companies have become a trend since around 1980 causing an increase in FOC, forestry companies and on-site engineers who professionally perform tending operations.

On the other hand, clear cut logging has been on the rise recently based on a long-held belief in Japan that cedar and cypress are economically advantageous to be clear-cut logged at tree age from 35 to 45 years. In addition, tree thinning to carry out lumbers along with establishment of work road networks is believed to be increasing in consideration of the work road network density of around 18m/ha.

2.2 Current state of Forest Owner’s Cooperatives

According to “Forest Owner’s Cooperatives Statistics” published by Forestry Agency, there are 679 FOCs in Japan as of March, 2011. The FOCs consist of 1.57 million members of forest owners with the total forest area of about 9.56 million ha which covers major part of Japan. While 30% of the whole FOCs are shared by those with total forest area exceeding 20,000 ha owned by the members, 20% of them are those with total area of less than 5,000 ha. While 56 FOCs consist of more than 25 full-time executives and staff members which amounts to 10% of the whole members, 382 of those consist of less than 10 amounts to more than half of the whole, 23 FOCs of which employ neither full-time executive nor full-time staff member. Main business contents of the FOCs include technical guidance to members, sales of lumbers to saw mills, and practice of tending operations. Almost half of the FOCs also engage in wood processing.

As FOC is a cooperative association, its first duty is to execute businesses directly relating to the members. According to Muro (2012), however, a questionnaire survey on 99 FOCs across the nation has revealed that about 40 to 50% of the budget was used by people other than the members. Among reasons asked, a reason that “it was necessary to keep the amount of work steadily” shared 78% of the whole. It shows a reality that many FOCs are positively securing jobs from those who are not the members in order to maintain the organization. Other parties except for the members include mostly "private forest owners other than the members", "(old) Forest Development Corporation (government corporation)", "local public authorities" and "the national government".

3 Activities of Hiyoshi town Forest Owner's Cooperative

3.1 Forest and Forestry in Hiyoshi town

Hiyoshi town FOC has been carrying out activities in Hiyoshi town, Nantan city, Kyoto where it exercises its jurisdiction. Located at rather west side of the central part of Japan, it takes about an hour by train to the town from city center of Kyoto which has been designated as a world's cultural heritage. It is a typical hilly and mountainous area in Japan where agriculture is the main industry.

According to 2000 World Census of Agriculture and Forestry in Japan, areas of the town and forests are 12,350ha and 10,700ha respectively and all of the forests are privately owned. Ratio of artificial forests is 42% and cedar and cypress grow by proportion of two to one in the forests. Ratio of forest area where trees less than 45 years of age grow is 76% of the artificial forest area.

Even though firewood and charcoal had been produced from Fagaceae since more than 1,000 years ago, conifers such as cedar and cypress were planted in place of logged Fagaceae since 1960's due to fuel revolution. A survey in 1996 conducted by Hiyoshi town FOC indicated that area of conifer forests required for prompt tree thinning reached 2000ha. There are a few small-scale forestry companies in the region other than the FOC which is the largest forestry company there.

3.2 Outlook of Hiyoshi town Forest Owner's Cooperative

The number of members the FOC was 934 (as of January, 2007) and forest area owned by the members was 9,917ha (as of April, 2005). Of its 20 staff members, 13 persons engage in operations on the site. Aside from them, six workers were employed to be paid by the jobs (as of April, 2007).

In 2006 fiscal year, among 192 million yen for the business cost of the FOC, 132 million yen was spent for Forestry Practice Proposal, showing the project to be the primary one. The logging amount of forest thinning and its sales amount are 10,000m3 and 73 million yen respectively and sales donations are plywood factories, chip plants and raw wood markets. Since 2004, new work road network has been established by a distance of 20,000m annually.

While tree thinning in the town had been performed for about 100ha annually by the forestation cooperative or individuals since 1995, tree thinning by the FOC was less than 50ha. However, since 1997 when Forestry Practice Proposal was launched and 2003 when full-fledged logging and thinning was adopted, more than 150ha of thinning has been performed annually by the FOC.

In order to perform tree thinning smoothly, Hiyoshi town FOC has started to prepare "Forestry Practice plan" as a sheet of estimate and subcontract of practice to show members in the corresponding complex zone. Tree thinning performed since 1997 has been based on this system resulting in almost 100% of contract rate.

Process to implement tree thinning is divided into three stages, i.e. plan preparation, plan implementation and post handling. At the plan preparation stage, “Forestry Practice Planners” may perform confirmation of boundary, design of work roads, measurements and planning after operation complex zone was set up in a meeting participated by all staff members and receive a subcontract of practice from owners within the complex zone.

In operation site for the plan implementation stage, operations of felling, road network establishment, timber processing and transporting are performed using chain saw, backhoe, harvester, and forwarder respectively, establishment of road network and transporting timbers to factories are consigned to external contractors. In post handling started upon completion of on-site operations, preparation and mailing of report to members as well as closing of account are performed.

4 Analysis

4.1 Conventional business model of FOCs

Main operation of most FOCs is tending and thinning (thinning without transportation). Such operation is performed for forests of the members in some cases and for those ordered form Forestry public corporations in other cases. Explanation of tree thinning is often provided from FOCs to members by making door-to-door visits or organizing a briefing session. When a member consigns a practice to FOC, the member is supposed to have also requested it to apply for subsidy for afforestation. FOCs which received a request then entrust operation of the practice either to on-site engineers with direct employment or on-site engineer group with subemployment or to external forestry companies.

In the course of these services, FOCs receive the practice outsourcing expense and subsidy application fee from the members. Almost 70% of such practice outsourcing expense is compensated by the national government and prefectural authorities in Japan. In some prefectures and local governments, whole of the practice outsourcing expense may be compensated by further added subsidy. In the context of a contract, customer for FOCs is their member but governments may be regarded also to be customers since they provide the fund. Expenses required for FOCS are practice operation expense (or outsourcing expense in case of outsourcing) and indirect expense (Fig. 2).

On the other hand, bidding system is often adopted for public or government corporations. Therefore, relationship between them is just a contractor-contractee relationship. If a bid is successfully made, procedures for a request are same as a case from members except for items relating to subsidy application. In case of public corporations, most of practice outsourcing expense is covered by subsidy from the national government and the like. In case of government corporations, principal fund is provided from tax money since they are extra-government organizations (Fig.3).

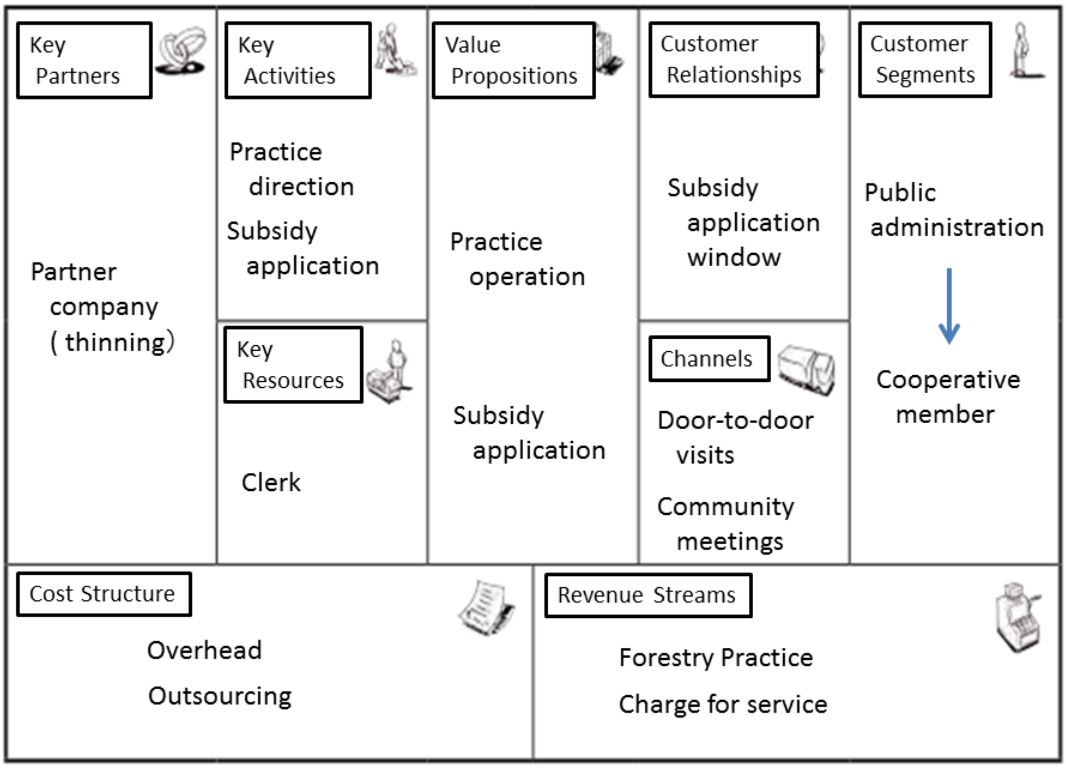

Figure 2: Business model of Thinning by FOCs (Cooperative member)

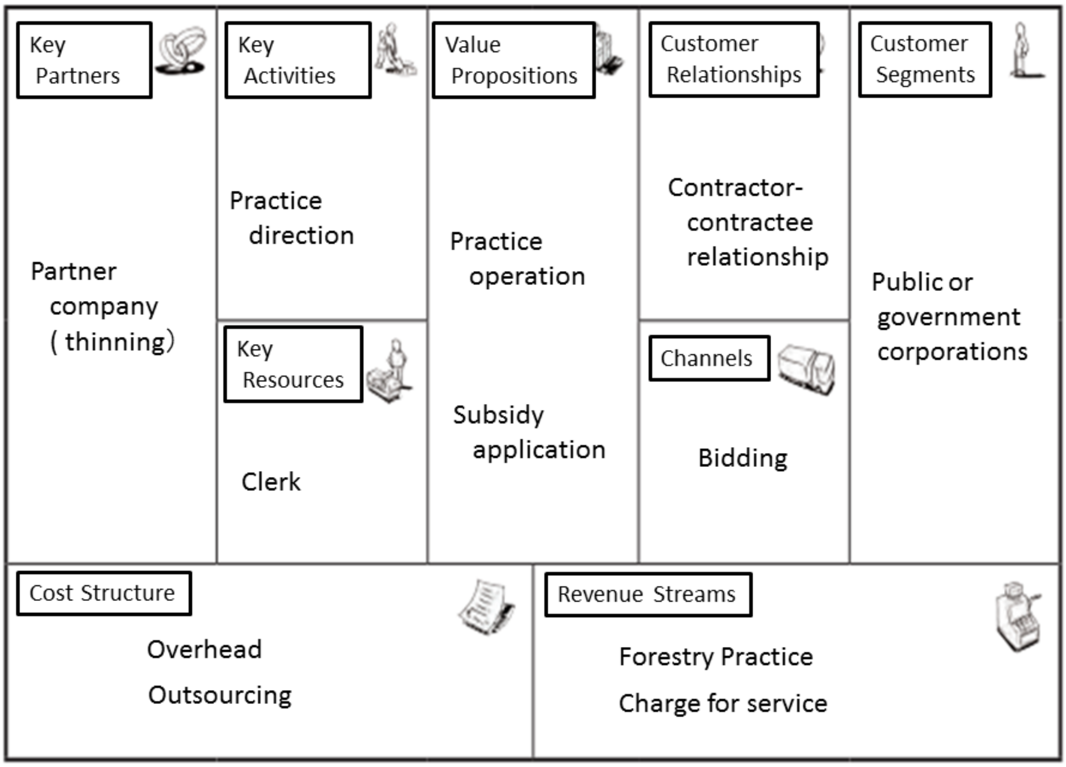

Figure 3: Business model of Thinning by FOCs (Public)

4.2 Business model of Hiyoshi town Forest Owner's Cooperative

While making door-to-door visits and organizing community meetings for members of Hiyoshi town FOC, "Forest Practice Planners" may respond to individual case. With a suggestion of current state of targeted forest and future vision as well as estimated sum, they recommend outsourcing of thinning practice to members. By granting various requests from members in the course of the procedure, they play a role as a consultant. Further, the planners perform appropriate forest management (including establishment of work road network) as well as sales of lumber and subsidy application for the sake of members.

Therefore, key activities include tinning practice, work road establishment and sales of lumber. The Forest Practice Planners are in charge of these design and execution management. In addition, productivity of more than 10m3/person has been achieved by using a harvester made in Finland and forwarders made in Japan.

While FOC receives practice outsourcing expense and subsidy application fee from the members, they receive sale proceeds of lumber from FOC and subsidy from the government as well. As the sum of lumber sales and subsidy usually exceeds the amount of payment to FOC, members are able to gain profit.

In such a case, consolidation of forest lands becomes crucial. In case of thinning and transportation, efficiency of practice may be further improved by promoting contract with members within the practice area. Therefore, member is a customer having an aspect as a key partner at the same time for FOCs (Fig.4).

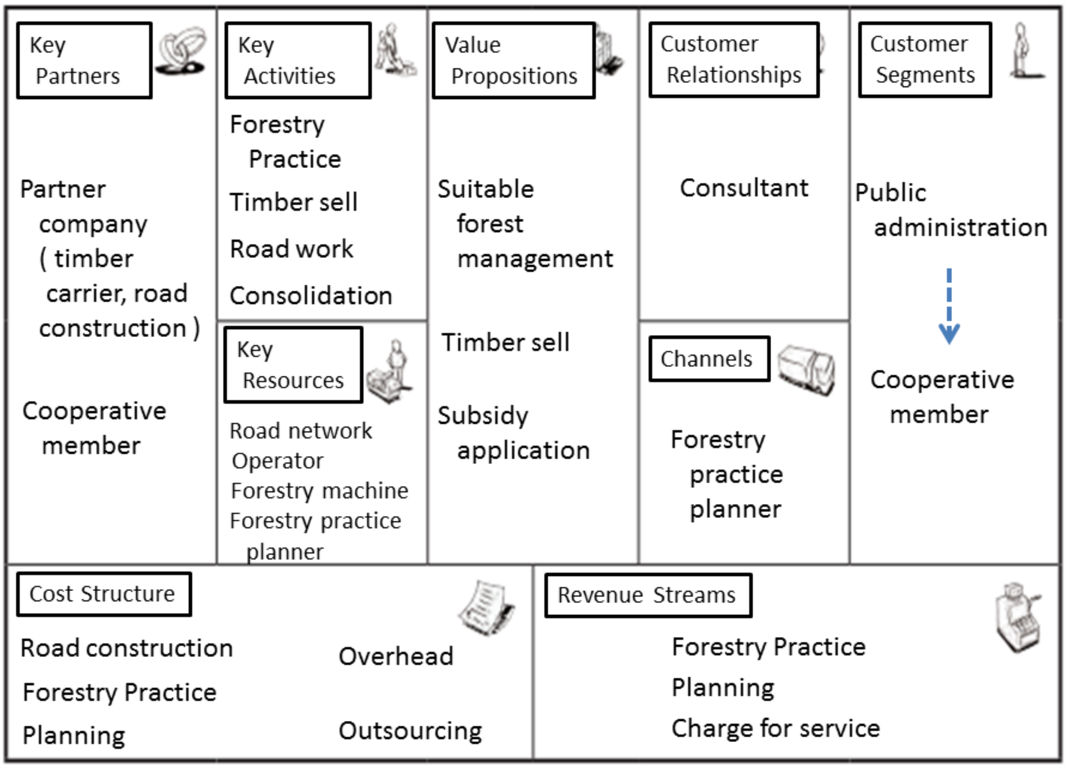

Figure 4: Business model of Hiyoshi town FOC

4.3 Comparison of business models

From a comparison of tending and thinning with thinning and transportation operated by Hiyoshi town FOC, at first it is possible to indicate that provided values are different. Tending and thinning is an implementation of practice just for once, whereas Hiyoshi town FOC suggests practice policy for the future and further makes a proposal of practice again according to the policy about 10 years later.

In terms of practice implementation system, management is almost unnecessary for tending and thinning since the operation is achieved by a chain saw man as a job as long as he has a chain saw. In case of thinning and transportation, a practice without management is prone to plunge into the red since machines are frequently used in such a case. Those who are in charge of management are not only responsible persons on the site but also forest practice planners who address negotiations with members. As sales representatives, they convey intention of members as well as make confirmations everyday for the intention to be reflected on the practice at the site.

In terms of key activities, there are differences in presence of not only lumber transportation but also consolidation. The same is true for revenues and expenses.

The differences between the two are believed to have been generated from those in three points whether ① it is tending and thinning or thinning and transportation, ② consolidation is performed or not, and ③ a forest management policy in the future is suggested or not. In case of implementing thinning and transportation, consolidation is required since work road networks are established and forestry machines are used. Therefore, the differences between the two are believed to exist essentially in two points whether ① it is tending and thinning or thinning and transportation, and ② a forest management policy in the future is suggested or not.

5 Discussion

I discuss here on a possibility that existing FOCs shift to a business model similar to that of Hiyoshi town FOC. First of all, shift from tending and thinning to thinning and transportation is not easy technically because use of heavy machine is necessary. Further, even though thinning is performed in both cases, it is required to improve information-gathering capacity and judgment of engineers on the site and office employees because practice is performed in consideration of timber price and transportation cost in addition to depiction of ideal forest in the future.

Then, as for the suggestion of forest management policy in the future, it is required for office employees of FOCs to receive certain training in order to obtain the ability to make suggestions. Although some experienced office employees and on-site engineers are able to explain required practice, few of them can suggest forest management policy based on knowledge of forest ecology. Fortunately, such training has been provided by the national and prefectural governments as a forest practice planner training.

However, even if shift to thinning and transportation has been achieved technically, this business model cannot work well unless values to be provided to customers are changed. In other words, it is believed to be necessary to shift from implementation of practice to that of appropriate forest management in a sense of value provided and to make the relationship firmer with members as a customer.

6 Conclusion

In this paper, I have conducted a comparative analysis on a business model for tending and thinning taken up by Japanese FOCs and that for thinning and transportation of Hiyoshi town FOC which is one of forestry policy models in Japan, by using a framework of business model campus.

As a result of the analysis, differences between the two were believed to be caused by two essential points whether ① it is tending and thinning or thinning and transportation, and ② a forest management policy in the future is suggested or not. Further, as a result of consideration on requirements for shifting to the business model taken by Hiyoshi town FOC, it is required to change the values to be provided by offering trainings for forest management to office employees and on-site engineers in order for them to be able to suggest a forest management policy in the future to members. In addition, it was believed that shift of a business model becomes possible from tending and thinning to thinning and transportation by offering technical trainings to support the shift to thinning and transportation.

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[BS2-6]

Group management of private forest in Japan

-Case study of North Kanto area-

Miho Yamamoto[1], Kawori Sano[2] and Yasuaki Onuki[3]

1 Japan's private forestry

In spite of its old history of forestry, Japan has imported 80% of the wood amount demanded. Private forest covers 58% of forest area, 65% of forest stock, and it is the most familiar forest for most Japanese, but it is faced with many problems as shown below.

1) In the late 1950s, restoration and reforestation after WW Ⅱ and 'fuel revolution' was promoted simultaneously, and that caused the great migration of young ages from mountain villages to cities. Many private forests used mainly as fuel wood forests had changed to coniferous manmade forests. Now private forest has about 73% of forest stocks of Japan's manmade forest.

2) Especially, individual owned forests are very small sized, dispersive, and there are many absentee owned ones. These forests are faced with the problem of inheritance now when the generation which did postwar afforestation has become over 80 years-old.

3）Although the forests by postwar afforestation policy have grown to be ages over 50 years, many owners hesitate to cut trees because of inactivation of market condition. Since the income which can cover reforestation costs are not obtained even if they cut down, sustainable forestry management is difficult to realize.

4) In 2012, the revised "Forest Law" introduced the new "Collective Forest Management Plan System" to overcome those vicious circle of postwar private forestry and to improve forestry productivity.

2 Research field, purpose and method

North Kanto area which is located on fringe of Tokyo -the huge housing market- is a developing forestry area since 1990's. Especially, the area managed by Takahara Forest Owners' Cooperative (FOC) is an outstanding case of Japan's 'postwar afforestation' area, that group management of private forest by the cooperative and lumber marketing by sawmill company have linked together efficiently. And this area is contrastively characterized by the adjoining forestry area 'Nikko'.

The purpose of this research is to assess "the forestry revitalization plan" with making clarify how

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group management has been promoted on what kind of background using these cases. Intensive fieldworks were conducted targeting on forest owners and the cooperatives about group management.

3 The feature of the North Kanto forestry area

3.1 The classification of forestry area

In addition to the geological and natural conditions of the forest, the very important social element which determines the character of forestry area is the relation with markets. In relation with markets, the following three points are important further: 1) when was the stimulus which promotes forestry development given, 2) who advanced commercialization, and 3) what kind of market was it linked with.

By the formation time, the forestry areas can be classified into three as follows, Type-1) forestry areas which originated before Edo and developed commodity production by the middle of Meiji, Type-2) forestry areas which rose quickly after the middle of Meiji -the progressive era of the capitalistic economy of Japan-, Type-3) forestry areas by the postwar afforestation boom.

The Type-1) forestry areas are developed when forestry products had extensive markets by the economic strength of local cities, or by the protection and participation of feudal domains. After the second half of the 16th century in which the shogunate and domain system by Tokugawa regime was built, reflecting on the wood shortage by the past over exploitation, study about sylviculture was propagated all over the country, and the wood culture which it is proud of in the world bloomed. Kitayama, Yanase, Chizu, Obi, Yoshino, Owase, Kumano, Sanbu, Nishikawa, are the cases. Hita, Akita, Kiso, Hida, are based on feudal domains or Tokugawa's concern.

The Type-2) forestry areas are quickly connected with a market by development of traffic centering on a network of railroads after the middle of 19th. Mountainous villages which commodity economy had hardly spread started to develop forest management. Japan began to follow the way to the modern state and introduced modern forest science from Europe, and aimed at creation of new industrial forestry. Such as telegraph pole, shipbuilding material, mine pillar, railway sleeper, tea box, axle, and building lumber, wood was important as basic materials of all demand, and in order to compensate the shortage, import from overseas was also advanced. Tenryu, Kaneyama, Kito, Oguni, Kanuma/Nikko, Ashikita, Yame, are the cases.

The Type-3) are forestry areas by the postwar afforestation boom. The postwar afforestation policy has completely changed Japan's forests and mountainous villages. And the trees planted in the times serve as the period of maturity, and "postwar afforestation" forestry is developing all over the country.

3.1 The Contrastive forestry areas—Takahara and Nikko

Although Takahara forestry area and Nikko forestry area are adjoining each other within Tochigi

Prefecture, they are contrastive examples in many points, such as the historical background, forest resources, and related market. By the above-mentioned classification of forestry area, Takahara forestry area is characterized by Type-3) and the Nikko forestry area is characterized by Type-2), respectively (Fig. 1).

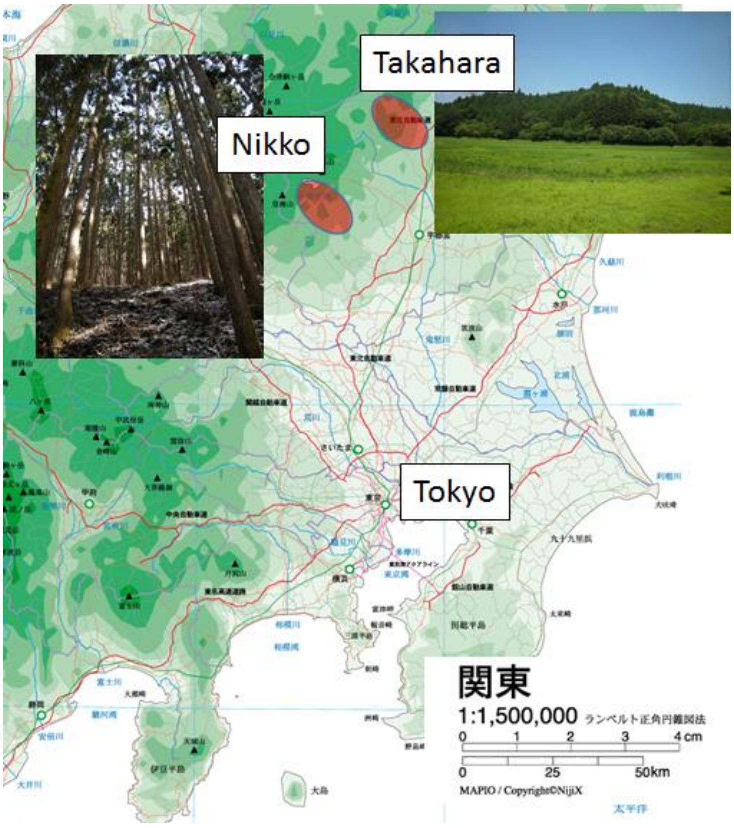

Figure 1: Takahara and Nikko

Takahara forestry area is one of the postwar afforestation areas which is developed on the hilly terrain of the Mt. Takahara. The forest land had been used as common-grassland for mowing and pasturing during Edo era, then was enclosed as national forest in the Meiji era, and granted by nation for settlement (Table 1).

The forest area is 39,355ha, private forest covers 48% of all forest, numbers of forest owners are 4,511, and 70% of them are FOC members. Most of them are postwar afforestation of cedar and cypress, and the peak of age class distribution is IX (40-45 year). The area is one of an outstanding case of postwar afforestation area as the nearest forestry area to Tokyo.

Nikko forestry area located on steep slope of Nikko mountain range (Fig.2) and alluvial fan, has long historical background since medieval era, governed by shogunate as 'Jinryo-territory of God-'. The forest area is 125,696ha, private forest covers 30% of all forest, numbers of forest owners are 4,256, and 53% of them are FOC members. Forest age is older than Takahara generally, the peak of age class distribution is XI (50-55 year).

Table 1: Chronologycal table of Takahara forestry area

Times	Events
The Edo era (-1869)	
	Commons of villagers within Utsunomiya domain
The Meiji era (1869-)	
	Incorporated into national forest
	The 1st land grant for logging, war horse pasture
The Showa era (1926-1989)	
1945	The 2nd. Land grant to Prefecture, village, settlement
1954	Shiota-Commons (350ha) was divided into 24 ownerships
1977	Thinning project at previous Shiota-Commons(350ha)+50ha(2nd Forest structure reform project)
	・・・ The basics of group management
1988	Thinning project at Nagai (100ha) (15ha/year×5)
1997	The combined Takahara FOC started up, T joint stock company started kiln dried timber production
2002	Direct payment and long term trust management
	Reorganization of regional forest management plan
2007	Reorganization of regional forest management plan
2011	Revise of basic unit of forest management plan, corp. T Co. became the No.1 company of Japan's sawmill company using sugi.

4 Group management of two contrastive forestry areas

4.1 The case of Takahara FOC

As for Takahara FOC, group management of private forest was started from the setting of model area of thinning project in Izumi ward conducted by 'Forestry structure improvement project ver.1' in 1988, and was established institutionally by long-term management commission advanced by 'Direct payment for forest management' in 2002. The 'Territorial joint forest management plan-Danchi-Kyodo-Segyo-' which set the Tahakara's 1980s model area, has been promoted since 1970s in order to advance the efficiency of Japan's small dispersive forestry, but the practical frame was becoming a mere name. Actually each jointed territory was not jointed each other, but it was settled only on paper just for getting subsidy.

'Direct payment for forest management' of 2002 aims at advancing stripped 'Territorial joint forest management plan' substantially. Coordination of Takahara FOC can be evaluated as a result which aimed at the political intention.

In Takahara FOC, the unit of the 'direct payment' agreement was set up in alignment with the basic unit of forestry planning. That is, the area division was made by 1)forest planning division, 2)municipality, 3)old municipality (of Meiji era), and 4)forest functional classification. The size of each agreement serves as a scale included communities and forestry groups without dividing them. On this systematic and basic unit, the agreement of long-term management commission was advanced smoothly.

The following points are mentioned as reasons that Takahara FOC can respond to the new forest program very smoothly. First, it is a mind to group management of Tahakara FOC. The FOC has six planners who are in charge of group management and each planner forms the plan concerning approximately 100ha forest area per year. At the same time, checking the forest registration, forest management map, cadastral map, the planners contact and refer to forest owners and group leaders. FOC always strives for the improvement in consciousness, in order to keep a confidential relation with FOC members-forest owners-. As a part of service to owners, especially they keep in mind to write simple and intelligible accounting documents.

In addition to the above, the following things are significantly mentioned as the factor which group management progressed smoothly, 1) easy geographical condition for forest management, 2) no problem with communication since there are few absentees, 3) forest owners are relatively rich and hardly depend on income from forests, 4) charitable forest owners made forestry groups and advanced postwar afforestation, 5) a huge lumber factory which has grown up in the same forestry area has created new market using whole forest resources of the FOC's area.

Some points of argument about the character of the forestry area are mentioned, 1) the stimulus which promotes forestry development was advanced by charitable forest owners who took the lead postwar afforestation, 2) market development was furthered by the local company which followed with the growing process of trees of postwar afforestation, 3) the related market is directly concerned to the big housing demands of metropolitan area which require speedy industrialized supply.

By the above, Takahara forestry area is characterized as which match industrial needs on land-based management-(not owner-based management).

4.2 The case of Nikko FOC

Group management is performed by completely different way in Nikko FOC. For example, in Osawa-ward, which located alluvial fan of Nikko, private forests are small scale and dispersive, contiguous to farmland or residential area, and is hard to make management space. FOC has to treat such case as one group on document, even if forests are adjoin respectively.

In Okorogawa ward, which located mountainous area, private forests are on the steep slope from the altitude of 300m to 1000m, and the surroundings of the forests of the middle-scale owners of 30-100ha are dotted with small-scale owner's forests.

Group management has been done by Nikko FOC as follows. Firstly, the FOC forms plan individually for every forest owner having more than the middle-scale of 30ha (12 groups, 12 members, 846ha). Secondary, the FOC makes forest groups of the owners of less than 30 ha (3 groups, 70 members, 904ha). Finally, the FOC makes forest groups of the small-scale owners of which forests located dispersedly (3 groups, 289 members, 2027ha).

Some points of argument about the character of the forestry area are mentioned, 1) four historical events can mentioned as the stimulus which promoted forestry development, the first one was primitive sylviculture advanced by the charitable forest owners in Edo era, the second one was objection making by the charitable forest owners to the treatment of Kan-min-division (enclosure of community forestry as national forest), the third one was the boom of logging telegraph pole from the Taisho era to the early Showa era, and the last one was the boom of postwar afforestation in 1950s. 2) Market development was basically furthered by merchants who concerned big scale central market in all three events. 3) The related market is desirable market for forest owners, and intensive sweet memory of profitable forestry about 90 years ago and 60 years ago has been remained still even now. Thus whole mind of Nikko forestry area is not based on speedy industrialized markets but old, qualitative, high-grade markets.

5 Learning from the case study

Group management private forestry is performed by completely different way even two adjoining areas in North kanto. In the case of Takahara, being linked together the both sides of whole log-lumber market, the unique superior case was created. The reasons are follows. 1) The base of group management promoted by national subsidy on 1980's, and the long term trust management between forest owners and the cooperative introduced with Direct Payment System on 2002. It can point out that activities of charitable forest owners in communities was carried out in comparatively new time, and that the confidential relation of a forest owner and FOC has been accumulated honestly. 2) The local sawmill company which became the biggest domestic timber sawmill enterprise, is making big timber market and also local employment cooperating with the FOC. It shows that the abundance of the talented people who live in local community, and mutual understandings and confidential relations can serve as key factor in marketing. And also the uniqueness of this case also suggests that "the forestry revitalization plan" effects on few cases.

The case of Nikko is assuming a former type forestry structure which inherited history and tradition, therefore it can accept neither speediness nor a systematic idea easily, and the rapid reform corresponding to change of the market has even a possibility of breaking the merit. It seems that the role of the FOC which takes charge of forest management becomes more important than now while the forest inheritance to the next generation from the generation of 'Showa-hitoketa' which bore postwar afforestation progresses.

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[BS3-1]

Experiences of introducing tools for better communication about land uses

The case of forestry within Vilhelmina Upper Forest Commons

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Abstract

Sweden has a fairly long history of formally organised forest commons, which, unlike in many other countries, are formed and organised in such a way that the shares of forestlands involved are privately owned but within a common they are jointly managed by forest professionals. Moreover, these shares are basically "set asides" of the private landholding, and thus cannot be owned or sold in isolation. While the shareholders receive their share of benefits from the commons, they often have very little or no direct involvement in the management of their commons, and as several previous studies have indicated, fewer shareholders are participating in their commons, including in the annual meetings. Studies of commons elsewhere suggest that long-enduring commons require an active participation of their members for their successful existence. In this study, we use the case of Vilhelmina Upper Forest Common (VUFC) in northern Sweden to explore the factors that might be contributing to this declining participation in the commons in Sweden. More specifically, we adapt participatory-GIS tools developed for reindeer husbandry planning to help with forest management plans as well as a tool for communication between management and the shareholders, and among the shareholders within the commons. This brief paper outlines the process and experiences of introducing GIS to the VUFC board. It is still an on-going process and we are continuing our study and documenting our experiences. Ultimately, through this study, we hope to elucidate what could be done to generate interests among the shareholders for a more active participation in their commons, and test the participatory-GIS as a tool for better communication about land-use and sustainable forest management in VUFC.

1 Introduction

The establishment of the modern Swedish forest commons was started during the late 19th century, as the undesired effects of the Great Land Redistribution and privatisation of land was being felt (Holmgren et al. 2010; Nylund 2009). The government aimed, through the creation of these forest commons, to prevent large-scale purchase and unsustainable exploitation of the forestlands by forest companies to the detriment of the farmers; to improve local economy and create a firm base for

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taxation; and to ensure continued existence of an independent class of farmers in Sweden (Carlsson 1999, 1997; Holmgren et al. 2010). Today, 33 forest commons, covering just over 0.5 million hectares of productive forestland and owned by some 25 000 individuals who also own private estates in the vicinity, exist in Sweden.

Unlike forest commons elsewhere, Swedish forest commons are constituted in such a way that the parcels (or shares) of forestlands involved are privately owned but as commons they are jointly managed. This distinction, and co-existence of private ownership and common management is what makes Swedish forest commons different (and interesting to study) from the commons in many other countries, where they tend to be either jointly owned and managed, or jointly managed while the ownership stays with the state or with other local authorities (McKean 1998, 1992). Furthermore, the shares in the forest commons are tied with the private landholding (farm/forest) and thus cannot be owned or sold in isolation. However, these shares can be transferred, usually to family members as inheritance, or sold along with the associated private holdings, thereby paving way for even an outsider to get access to the commons. On the other hand, when a shareholder moves away from the area, s/he will retain the shares in the commons as long as s/he holds on to the associated private property. Again this is distinct in Sweden from the commons elsewhere, where long-term association and residency in the local area where the commons are located is often one of the primary requirement for membership in those commons, and when they move away from the area they lose their rights to the commons even if they retain ownership to their private property (McKean 1992; Ostrom 1990). Moreover, shareholders in the Swedish forest commons could not only be the individuals but also the companies, church or the State so long as they own the property linked to the share in the commons (Carlsson 1997).

One of the most important aspects in the success of any community-based resource governance, such as the forest commons, is the active participation of the members in the management, governance, decision-making, and in the utilisation of resources from those commons. However, previous studies on some of the Swedish forest commons have not only pointed out the diminishing role of shareholders in terms of governance (i.e. “decision-making rights”) of their commons (Stenman 2009), but they have also pointed to the fact that the shareholders in Swedish forest commons do not bear costs proportional to the benefits they obtain (Carlsson 1997). Moreover, a more recent study has highlighted that although the resident shareholders seem to be generally satisfied in the way their FC is governed/managed, the participation in management, governance and decision-making is rather low among the shareholders (Lidestav et al. 2013). Furthermore, women’s participation in various aspects (utilisation, decision-making, benefits sharing) is found to be significantly lower compared to their male counterparts. Overall, previous research indicates a need to stimulate participation among the existing shareholders in these forest commons in order to make them truly participatory forest governance institutions.

In this paper, we present the case of Vilhelmina Upper Forest Common (VUFC) in Västerbotten in Northern Sweden where we attempt to introduce participatory-GIS (pGIS) as a tool not only for the management of forestland but also as a tool for communication about land uses among between board and the shareholders. VUFC is one of the major forest common in terms of size of forestland involved as well as the number of shareholders. However, it is also one such common where the participation among the shareholders, particularly in the governance and decision-making through general assembly held twice a year is among the lowest. As such this common presents a good case to study the shareholder apathy in governance/management, and to explore whether tools such as pGIS could be used to increase shareholders' interest in the management of their common forest as well as for better communication between the board and shareholders, and among the shareholders themselves. This paper briefly summarises the process and progress thus far in our research in VUFC.

2 Introducing participatory-GIS to Vilhelmina Upper Forest Common

We now have a fairly long history of development and successful use of participatory-GIS (pGIS) in reindeer husbandry in Sweden (Sandström et al. 2012; Sandström et al. 2003). More importantly, the pGIS developed and used for reindeer husbandry can be considered a tool for a broader multi-stakeholder land use planning, for the nature of reindeer husbandry practices is such that there is a sustained interaction between reindeer husbandry and other land uses such as forestry, mining and infrastructure development (ibid.). Furthermore, Sandström et al. (2003, 2012) show that tools like pGIS can be used not only for multiple land use planning and decision-making, but also for 'collaborative learning' and as a common communication platform among the stakeholders who are often competing and making trade-offs for the resources within the landscape.

Given the experiences of using pGIS in reindeer husbandry, we decided that a specifically modified pGIS from reindeer husbandry to address the needs of forest and other land use plans within VUFC could be used as a tool for forest/land use planning and as a communication platform in VUFC, especially to help increase shareholders' engagement with the common. In parallel with our on-going research on shareholder participation and perceptions in VUFC that involved questionnaire survey and discussions with the board, we introduced the pGIS to the board as the first step. As with any new technology introduction and adoption, we felt resistance from the board to use the pGIS in their forest management or in wider land use planning, or even to consider its potential benefits. This was particularly true for the forest manager in the common, who is responsible for the day-to-day forestry operations within the common.

Despite initial apprehension about the introduced pGIS, some of the board members were curious about its functioning at the very least, and were prepared to install and try it in their personal computers. Over a number of meetings and discussions with the board, we demonstrated how the pGIS works, what could be done with it and how it could also act as a communication platform regarding land use within the common. We also installed the pGIS on some board members' computers as well as that of the forest manager for them to try out. Thus far we are yet to receive feedback regarding their use of the pGIS and whether they have found it a useful tool in their land use planning and decision-making.

3 pGIS in VUFC: some reflections

It is clear that our attempts to introduce pGIS in VUFC have faced considerable challenges thus far. However, it is not unusual for any new technology introduction and adoption to face some resistance at the beginning, and we find studies of resistance to technology in agriculture to business to information and communication technology (ICT) such as GIS (Erik de Man and van den Toorn 2002; Parente and Prescott 1994; Morris and Venkatesh 2000; Budić and Godschalk 1994; Waddell and Sohal 1998). Furthermore, there could be some genuine concerns in part of the VUFC board against adopting the introduced pGIS without proper scrutiny and tests. Based on our discussions with the board and forest manager of the VUFC, as well as past experiences with pGIS in reindeer husbandry, we identify three potential reasons for the resistance in pGIS adoption in VUFC.

First is the often-held belief that GIS is a 'difficult' technology to learn and use for non-experts. In our discussions with the VUFC board, it was clear that they viewed GIS as a specialist tool and that it was not easy for a layman to understand or to use it. Furthermore, it could also be due to the fact that almost all of the board members are older men, and prone to resistance to technology adoption, at least initially (Morris and Venkatesh 2000).

Second is the fact that it has only been just over a year that we began this project in VUFC, and that our engagement and interactions with the VUFC board is still in its infancy. It takes time for both the parties to understand and trust each other, as well as for the VUFC board and the forest manager to learn about the tool and its potential use and evaluate its effectiveness. As such, we believe that it is too early to evaluate the adoption of the pGIS in VUFC. The experiences with reindeer husbandry shows that its takes a decade or more to have a fully technological functioning system in place that people can manage themselves and use it to their benefit (Sandström et al. 2012; Sandström et al. 2003).

Finally, and more importantly, we have to consider the fact that this is a case of introduction of new technology from outside – in contrast to the development of technology from within or in partnership with the subjects, as was the case with reindeer-herding Sami people (Sandström et al. 2012; Sandström et al. 2003). In this sense, it is not easy to engender ownership of the introduced technology as it is for indigenously-developed one. As Waddell and Sohal (1998) state, people usually do not resist change *per se* but the inherent uncertainties, and the members of VUFC board are likely to have a similar view regarding pGIS at this state. Furthermore, as other studies have shown, introduction of technology like GIS are not always going to be a success, and the successes and failures are often dependent upon the organisational environment, available resource and commitment, as well as culture within the adopters and the organisation involved (Erik de Man and van den Toorn 2002; Budić and Godschalk 1994).

4 Conclusion

In this paper we summarise our experiences of introducing participatory-GIS as a tool to help in land use planning and as a communication platform within the Vilhelmina Upper Forest Common in northern Sweden, which suffers from a severe lack of participation from its shareholders in management, governance and decision-making for a participatory resource governance institution. Although our attempts to introduce pGIS to the board members of VUFC have been quite challenging, we believe that it is going through a normal process of initial resistance to change and technology adoption that we have seen in other sectors such as in agriculture and business over the years. It is too early to tell whether we will be successful in getting the VUFC use pGIS as a tool for communication about land uses as well as in land use planning; however, we believe that this process has already been quite fruitful in terms of getting the board to open up to a large extent and in getting them interested in finding ways to better communicate their land use decisions with the shareholders of the commons.

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[BS3-2]

Communal land tenure in the Lao PDR:
Extracting lessons from two pilot initiatives

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1 Abstract

In 2011, the National Land Management Authority (NLMA) of the Lao PDR awarded the first communal land titles in Laos. These titles, awarded for village forest in Sangthong district in Vientiane province, were the product of a multi-year effort of NGOs, the NLMA, and local communities. The Sangthong case was followed in January 2013 by communal titles for communities resettled because of the Nam Theun 2 hydropower project in Nakai district in Khammouane province. Although both cases are hailed as a success, there are important differences in the processes followed and in the rights awarded by the two sets of titles. It is also still unclear how other villages in the Lao PDR can obtain communal forest titles.

This study aims to provide an analysis of these two cases, and to address the following questions: Which process was followed to obtain the communal titles? Which actors were involved in the process? What rights are conveyed by these titles on the ground? Is the titling process as followed in Sangthong and Nakai applicable in other communities? What lessons can be extracted for other areas of the Lao PDR? The analysis is based on a desk review, semi-structured interviews with stakeholders from NGOs and the local and national-level government, as well as field visits and interviews with local community members.

2 Introduction

The recent awarding of communal land titles in Sangthong and Nakai districts in the Lao PDR and the ongoing discussions about reforms to the land law create the need to analyze these two pilot projects in the wider context of land issues in Laos, and to understand how the experiences from these two communal land title cases can be devolved into lessons learned and instructions for implementing communal tenure in other communities.

The natural resources in the Lao PDR are coming under increasing pressure from foreign investment in hydropower, production forestry and concessions for cash crop plantations (Schönweger et al. 2012, LIWG 2012). There are concerns about the impact of a growing commercial interest in Lao

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land resources on local tenure security, both on the individual and the community level. Communal land and forest tenure have been touted as possible mechanism to strengthen tenure security and at the same time provide a basis for sustainable forestry. Furthermore, communal land tenure could provide social accountability at the community level and help forest protection efforts (La Viña and Lynch 2011, Andersen 2011, Larson 2011). However, devolution of land tenure to local communities is only the first step in securing forest access rights. Tenure reforms in other countries have faced serious challenges in actually realizing the rights awarded, in the need to establish or strengthen institutions to exercise rights, and in defending them from local and national-level competition (Larson 2011).

In both of these cases, several conditions were in place that facilitated communal titles, such as a completed participatory land use planning process, and a management plan for the village forest (in the case of Sangthong), as well as donor pressure tied to infrastructure investments (in the case of Nakai). Most importantly, local and provincial-level officials were supportive of the communal titles in both cases. While information-sharing workshops were organized right after the Sangthong titles were awarded, there has been no assessment of this case since then. The Nakai titles were awarded only a few months ago, therefore very little information has been shared about this case to date. Since there is interest from a wide range of projects within Laos to replicate the community titling process, an analysis of the underlying conditions, the commonalities and differences in the Sangthong and Nakai communal titling cases, and a review of success factors and lessons learned, are an important step in promoting further communal land tenure in Laos.

The communal titles also raise new questions about rights to use and own forests in the Lao PDR. Going forward, it is unclear whether and how communal land titling can be expanded to other villages in the Lao PDR, and what benefits and institutional structures these titles translate to on the ground is still poorly understood. In addition, discussions are currently underway in the Lao PDR about a draft national land policy, and reforms to the land and forest laws. These revisions may provide an opportunity to facilitate the application of communal land tenure, based on the two existing cases.

3 Materials and Methods

This study was based on a review of existing analyses of the legal and policy framework in the Lao PDR relating to communal land, as well as project reports and other information on the two communal land title cases in Laos. Semi-structured formal and informal interviews with representatives from government, non-governmental organizations, Lao non-profit organizations, and the Nam Theun 2 Power Company (NTPC) were conducted to gain a deeper understanding of the conditions in place before communal titles were implemented in these two cases, how the titles were realized, and what rights and responsibilities the titles convey on the ground. Interviews were also conducted with thirty-six community members from Sangthong district.

4 Results

The following description of these two cases shows that the two existing cases of communal land titling in Laos followed different processed, issued different types of titles, and convey different kinds of rights. A comparison of the main contrasting points follows.

Sangthong district:

In Sangthong district, communal titles were issued as a side project under the sustainable bamboo value chain work of the international non-profit organization SNV and the Lao non-profit association GDA (Gender Development Association)[1]. The SNV-GDA project worked with villages and local government agencies to support participatory land use planning (PLUP) as well as management plans for areas zoned as village bamboo forests during the PLUP process from 2007 to 2008. Based on these management plans, and the legal basis for communal land provided in the 2007 NLMA Instruction 564 as well as the 2008 Prime Minister's Decree 88, the project decided to pursue communal land titles.

Since no instructions existed on how to transform the legal definition of communal land in legislation into actual land titles for communal land, the project conducted a desk review and held meetings with central-level government agencies prior to engaging at the local level. The project created a field team that included various members of the Land and Natural Resource Research and Information Center (LNRRIC) of the National Land Management Authority. Then, the project organized a meeting with representatives from five target villages in Sangthong district, and after determining that the villages were interested in communal titles, undertook participatory action research in the villages, in cooperation with the District Land Management Authority (DLMA). After village consultation on which areas would be appropriate for communal management, the communal land was demarcated with GPS units with village representatives and neighboring landowners to resolve any boundary issues. The team adapted the existing formats for individual land titles for communal land, with supporting documents including a land map, justification, and the temporary land use certificate specifying "village use forest" as parcel type. In August 2011, the temporary land use certificates were awarded for the village bamboo forests of five villages in Sangthong district: Napo, Houayhang, Kouay, Xor and Vangma for a total of 533 hectares. The land use certificates were signed by the District Governor of Sangthong district and the representative of the DLMA (Sayalath et al. 2011).

While the bamboo user groups working with SNV and GDA on the value chain project were put in charge of the management of the bamboo forest in the management plan, the titles were issued in the name of the village, and are administrated by the village authorities. This separation of management and title holding was explored further in community interviews in Sangthong district. The rights awarded include access, withdrawal, management, and exclusion rights (Schlager and Ostrom 1992), but no alienation rights. It was also not clearly defined how

[1] The Gender Development Association was renamed from Gender Development Group in 2012.

membership is conferred or removed, especially among relatives of current villagers and new village members.

The area under title was chosen from the overall village lands, specifically to be included in communal titles. Village bamboo forests were chosen because of the SNV-GDA project's focus on bamboo. Other areas the villagers identified as potential land areas for communal titles were the land of the school, village office, cemetery, health center, temple, and village conservation forests (Sayalath et al. 2011). The titles were awarded as temporary land use certificate. If no conflicts emerge about boundaries and no complaints are made, it is expected that the certificates will be transformed into permanent titles after 3 years. However, due to the ongoing drafting process of a national land policy for Laos, and the concurrent revisions to the land and forestry laws, it is as yet unclear which process needs to be followed to convert the temporary to permanent titles. The District Office of Natural Resources and the Environment (DONRE) in Sangthong (reformed from DLMA in 2011) is waiting for instructions on how to proceed.

Since the Sangthong case was the first instance in which communal land titles were issued, government buy-in was essential. Both DONRE at district level, as well as the LNRRIC at national level, supported the idea of communal title to bamboo forest, and implemented the process, with SNV and GDA providing financial and technical assistance. There was a debate about how and whether to tax the communal forest. Certain legislation provides for tax exemption for communal land, but there is a prevailing opinion in the government that land put to economic use should also contribute to the state economy. In the end, the communal land is not being taxed, according to Presidential Decree No. 01/2007 PO on Land Tax, and Article 4 of the NLMA Instruction No.3204 on Collection of Fees and Service Charges by the Land Management Sector. The SNV-GDA project paid for the service charges and titling fees. The Sangthong DONRE office is interested in replicating the communal land titling in other villages and for other types of land, but currently lacks funding for staff time and field work.

<u>Nakai district:</u>

Following consultations with government, community and donor stakeholders as well as the Nam Theun 2 Power Company (NTPC), collective land titles were awarded to families resettled on the Nakai plateau from the reservoir area of the Nam Theun 2 (NT2) hydropower project. The titles were based on the Khammouane Provincial Governor Decision No. 529/KM.GOV from March 5, 2012, ordering that collective land titles be issued to the 14 resettlement villages (Nongbouakham, Thalang, Sop Phene, Sop Hia, Nam Nian, Sop Ma, Nakai Tai, Nakai Neua, Nongboua, Bouama, Phonsavang, Sop On, Ban Done, and Khon Kaen).

The concession agreement underlying NT2 did not specify that communal titles should be sought, since communal titles were not under discussion in Laos at the time the agreement was negotiated. However, the CA did require individual land titles for a residential plot and 0.66 ha of agricultural land to be issued to resettled families to ensure secure livelihoods. The affected 1,310 households were resettled between 2007-2009, and it became clear that some of the resettled families were not able to subsist on the allocated individual agricultural land. There were also concerns about the security of tenure over the allocated entire resettlement area. The project team and the Resettlement Management Unit of the Nakai district government therefore decided to pursue communal titles for the resettlement area, and to designate part of the resettlement area as additional agricultural land for food-insecure families, as provided for in the concession agreement.

A Participatory Land Use Planning process (PLUP) (which was also required by the concession agreement) was conducted in Nakai between 2009 and 2011 to ensure individual land was allocated in the appropriate use areas, to choose appropriate additional areas for agricultural land, and to establish different land use zones and boundaries, including communal land areas. The PLUP team compiled rights and responsibilities for the different land types within each village boundary in the resettlement area, which were then approved by the District Governor. The regulations define which areas are covered by collective titles for each village, and defines users, their rights, safeguards, and consequences for misuse. The regulations were then validated by the district government (Nakai District Administrative Bureau 2012).

The process was led by the Resettlement Management Unit of the Nakai district government. The NTPC provided funding for technical assistance, PLUP and Nakai Resettlement Management Unit staff as required by the concession agreement. Support from the provincial governor Mr. Khambay Damlath and the district governor Mr. Bounma Soudsadavorn were estimated to be essential to the successful titling process (Nakai District Administrative Bureau 2012).

In Nakai, the titles awarded are permanent land titles. The title documents used follow the new title format issued by Article 5 on format of communal titles of the NLMA Instruction No. 1668/2008 on the Use of New Formats of Land Titles. The title documents were signed by the Provincial Land Management Authority (PLMA), since the District institutions are not authorized to sign permanent land titles. The communal land is tax exempt, and all services charges and titling fees were paid for by the NTPC (Nakai District Administrative Bureau 2012).

The original 14 resettlement villages have since been consolidated into 9 villages. To prevent conflicts between ethnically uniform villages that have been joined in a new consolidated village, the communal titles were issued in the name of the original resettled villages. The village authorities are represented by the elders and community leaders in each village. The use of the communally titled land is limited to the confirmed list of affected households in the 14 original villages, and their natural descendants. Relatives or other families who move into the area have no use rights in the communal land. Decisions on use and management of the area need 70% of the vote of the eligible households, with one vote per eligible household. Requests for the use of the communal land are made in writing. The communal land titles in Nakai convey access, management, withdrawal, and exclusion rights, but not alienation rights of the land. The land cannot be sold, transferred, leased, loaned, inherited or used as collateral (Nakai District Administrative Bureau 2012).

In contrast to Sangthong, all land delineated as village land in the PLUP process is communally held land, unless otherwise specified. This includes cemeteries, agricultural and forestland (unless individually owned as part of the 0.66 ha household plot, or other individually held land), the reservoir area, the village road network, and any other areas as specified by the village. Based on PLUP, additional agricultural land was allocated to food-insecure resettler families. This land was taken from degraded forests in the VFA area and is included under the collective titles. The additional agricultural areas are not awarded to families permanently, and the families cannot trade, sell, or loan the allocated land. The communal land is awarded to the village with one title for each land parcel, except in the case of forestland, which is titled as one zone per village (Nakai District Administrative Bureau 2012).

Forestland, according to the Forestry Law and the Khammouane Governor Decision No. 0085/KM.GOV of 09/02/2005 on the Management and Use of the Resettlement Area, should be accessed in accordance with the forest management plan, and can be used for fuel wood, grazing, and NTFPs for home use or sale. NTFP harvests are monitored by members of the Village Forestry Group. No commercial NTFP harvesting is allowed in designated protection forest. Hunting, and commercial harvesting of high-value timber species are not allowed. Resettled families may use degraded forest areas for agro-forestry, silvopastoral systems and enrichment planting of NTFP species (Nakai District Administrative Bureau 2012).

There are six main differences between the two cases:

1) <u>Permancence of titles:</u> In Sangthong, the communal land was awarded temporary land use certificates. These certificates were introduced in Laos as a preliminary step in the process of land registration and titling, and award use and exclusion rights (but not alienation rights) to the community. In Nakai, the communal land was awarded permanent title without the preliminary step of awarding temporary land use certificates first.
2) <u>Government authority:</u> In Sangthong, the certificates were signed by the District Governor, and the certificates are awarded in the name of the community. In Nakai, the titles were signed by the Provincial Land Management Authority. The titles are awarded in the name of the 14 original resettled villages. The beneficiaries (members) are defined as the original resettled households affected by Nam Theun 2, and their direct descendants.
3) <u>Decision-making body</u>: In Sangthong, the village forest management committee makes decisions about management of the communal land, following the management plan (where it exists) and following instructions from the District Agriculture and Forestry Office (DAFO) and DONRE. In Nakai, the original resettled families in each pre-consolidated village have one vote per household to make decisions about the communal land.
4) <u>Type of land granted title:</u> In Sangthong, a specific area in each village was delineated as communal land, based on a management plan compiled for village bamboo forests, and the PLUP process that defined boundaries and zones of different village, state and individual lands within the village. The village forest area under title is secondary forest primarily composed of bamboo. The villagers have the right to harvest NTFPs and bamboo after receiving approval from the Village Forest Management Committee. In Nakai, all village lands that were not explicitly designated as individual land or state land (for hospital, government office, etc.) were included into the communal title. Separate titles were issued for each land use zone (in

the case of forest land) and for each parcel. The area under communal title includes village forests, community agricultural land, and conservation and production forestland. While the villagers do not have commercial timber harvest rights in the communally titled forestland, they do have the right to use the land for pasture (degraded), NTFP harvest, and agroforestry activities.

5) Membership definition: In Sangthong, the village authorities are in charge of making decisions on access to and use of resources in the communal land area. However, there is no clear definition of membership beyond "village members". It is unclear how relatives, or families from other areas moving to these villages will be integrated. In Nakai, the regulations on the collective land specify which families have voting rights to make decisions about the land. The regulations clearly set out reserved housing land for direct descendants of the resettled families, who are also entitled to decision-making rights.

6) Process followed: In Sangthong, the communal titling process was initiated after PLUP was completed and a management plan for the specific bamboo forest areas to be included in communal titles was finalized. This means that boundary issues had already been resolved. In Nakai, the communal titling process was initiated during the PLUP process, and boundary issues and definition of lands to be included were discussed at the same time as PLUP.

5 Discussion

In comparing these two pilot cases on communal land titling in Laos, it becomes clear that there remains a lot of room for interpretation about the legal basis for communal tenure in the Lao legislation. In interviews, representatives from both projects insisted that due legal procedures were followed in issuing the land titles for communal areas. Further, in both cases the local and provincial government institutions actually implemented the titling, as required by Lao law. This means that both cases, in their own way, could theoretically be used as legal precedent for other communities in Laos. However, as seen in the preceding section, there are significant differences in how the communal titles were obtained, which rights they convey, and how decisions are made about the communal land.

In informal and semi-structured formal interviews with representatives from a range of international non-governmental organizations and Lao non-profit associations interested in pursuing communal land titles in their own projects, very different levels of knowledge and interest in communal titles were reported from their respective local and provincial government partners. Several institutions reported that government representatives had either not been willing to allow communal titling in their jurisdiction, or had indicated that they saw the Nakai titles as an extraordinary case based on special legislation applied to the resettlement area. Some representatives indicated that it would be impossible for their project to apply the experiences from Sangthong and Nakai without national-level instructions specifying the steps to be followed to obtain communal land tenure. In contrast, other interviewees thought that the lack of such detailed instructions provided room for experimentation with communal titles in Laos, which would be an important opportunity to learn from experiences before drafting binding nationwide guidelines.

The high level of divergence in the interpretation of existing legislation therefore creates both barriers to replicating the communal land titles in Laos, as well as opportunities for testing different models. However, in both the Sangthong and Nakai district cases, the support of local as well as higher-level government institution was seen as key pre-requisite for communal titling by the respective project. In Nakai district, the long-standing involvement of the World Bank, Asian Development Bank, and the existence of the NTPC, a local private sector institution with an obligation to follow the requirements of the concession agreement, provided significant political pressure and financial support for the communal titling process. In both cases, the project bore the costs of the communal titling. Most villages would be unable to pay for the titling fees and service costs, even if there are no taxes for the communal land. It therefore seems as if there are two key pre-conditions for pursuing communal titles in Laos: support from local and provincial government institutions, and financial support for the associated costs.

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[BS3-3]

Assessment of timber products in small scale community plantations: back to basics.

A case study from Solomon Islands

Frédérique Reverchon[1] and Timothy J. Blumfield[2]

Abstract

Where market opportunities are not yet developed for timber products, the establishment of a market chain is conditional upon an accurate assessment of available timber resources. This can prove to be difficult in small and relatively isolated community plantations due to a lack of material, financial and human resources. In Solomon Islands, teak plantations owned by local growers are scattered across the islands, and a market for this timber is starting to develop. A problem facing all community foresters is a lack of knowledge regarding merchantable volume and hence of the commercial value of their trees.

We organised a series of workshops in several communities in Western Province of Solomon Islands to teach local growers how to assess their own plantations. We will describe the challenges faced during the planning and the realisation phases of the workshops and will present the solutions we designed to overcome these problems. Examples of the methods employed are easily applicable techniques to evaluate merchantable tree stem where no clinometer is available, using locally made equipment and locally developed simple timber volume conversion tables. Finally, we will present the outcomes of the assessment to provide an overview of how small scale community teak plantations are structured in the Solomon Islands.

1 Introduction

In Solomon Islands, market opportunities are slowly developing for community timber growers. Smallholders located on the main island of Guadalcanal have reasonable access to buyers in the capital, Honiara, through the road network. However, growers in more remote locations have had little opportunity for accessing markets for their trees. Where market opportunities are not yet developed for timber, the establishment of a market chain is conditional upon an accurate assessment of available timber resources. However, growers have to be able to know how much timber they own and how much money to expect from its sale, for a fair trade to take place. This can prove to be difficult in

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small and relatively isolated community plantations due to a lack of material, financial and human resources.

In Solomon Islands, teak plantations owned by local growers are scattered across the islands, and a market for this timber is starting to develop. However, plantation owners have little information about the total volume of their trees, their merchantable volume, the grading rules in use, and hence about the commercial value of their trees. This lack of information makes them vulnerable to the pressures that a monopoly buyer could bring, with the risk of this buyer clear-felling their plantation for a low financial return. Most of these plantations have been planted 10 to 15 years ago, and have effectively stopped growing as they are overstocked. The fact that thinning has to be undertaken constitutes an opportunity for selling thinned trees and promoting the growth of the remaining teak trees.

With the help of local forestry officers, we therefore organised a series of workshops in several communities in Western Province of Solomon Islands to teach local teak growers to differentiate the trees to be thinned from the trees to be kept in the ground and to assess the value of their own plantation.

2 Methods

2.1 Study area

The workshops were held in four localities of Western Province in Solomon Islands. Western Province is the area of Solomon Islands where the majority of teak growing is taking place, and where market access is the biggest challenge as this Province is composed of many scattered islands. Two localities were selected on Rendova Island ($8^{o}28'02$ S, 157^{o} $24'12$ E) (Mauru and Mandali), one locality in Vonavona Lagoon ($8^{o}12'52$ S, 157^{o} $06'18$ E) (Tamboka), and one locality on New Georgia ($8^{o}19'41$ S, 157^{o} $16'30$ E) (Munda), the main island of Western Province.

2.2 Workshop booklet

A booklet was designed to be distributed to each participant during the workshops in order to facilitate the understanding of the methods to be used (Fig. 1). The booklet introduced the concept of trees to be kept, trees to be thinned and trees that are unsalable, according to the grading rules in use by one of the main timber buyers in Solomon Islands. The trees to be kept are considered as grade A and consist of the trees with best diameter, height and form that must be left in the ground to grow on for a further 10 years to give real economic returns to the growers. The trees to be thinned are considered as grade B and have a commercial value, although lower than grade A trees (Fig. 1). These trees are of smaller diameter classes and therefore command lower prices. These are the trees that underwent a detailed assessment of volume and form during the workshop. Finally, unsalable trees are considered as grade C, and have no commercial value due to poor growth or form. We are promoting the concept of home use for this timber for furniture, construction and even as an alternative feedstock for the indigenous wood carving industry.

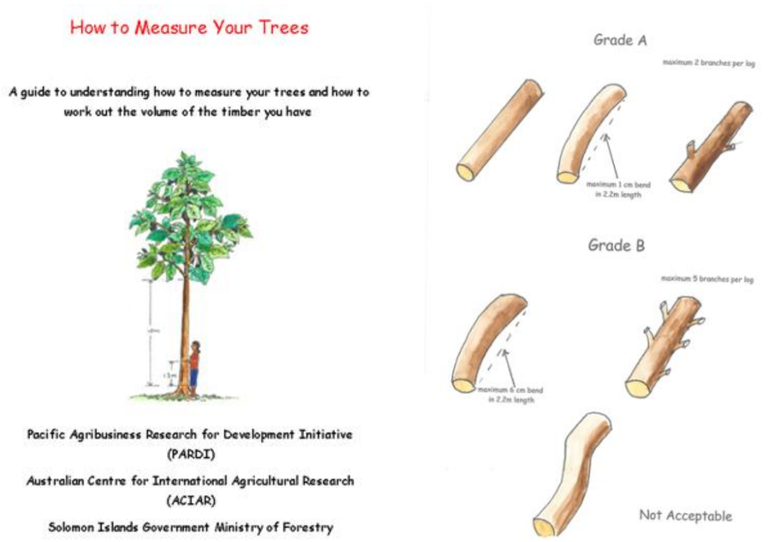

Figure 1: Booklet cover and grading rules in place for grading a log as Grade A and Grade B

The definition of merchantable stem and diameter at breast height (dbh) were clarified. A simple method to measure the height of the merchantable stem was introduced, and consisted of using wooden sticks marked at ¼ of their length, with the stick held straight and lined up with the top and the bottom of the log length. This simple method, which does not require any expensive piece of equipment such as clinometers, involves the presence of another person to mark the tree where the person holding the stick sees the ¼ mark on the stick to be. The length between the bottom of the tree and the mark is one quarter of the total log length. To assist the comprehension of the measurement of dbh and tree height, we used the help of a local artist to draw the different stages of the measurement process (Fig. 2).

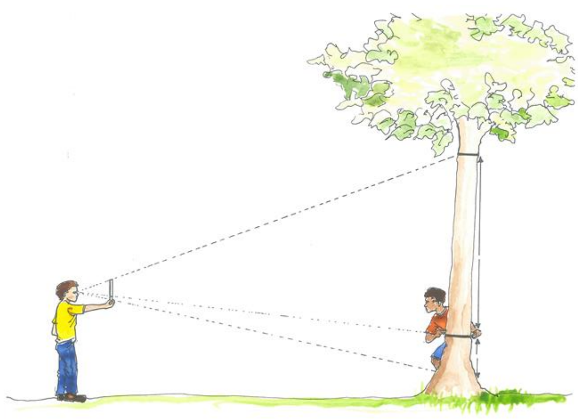

Figure 2: Measuring tree height with the “stick method” as illustrated by a Brian Feni, a local artist

The booklet also introduced the tables to be distributed during the workshops, which would gather data on the number of trees in each height and diameter class and enable to calculate timber volume (Fig. 3). The minimum diameter for trees to be recorded was set to be 17 cm, as a lower diameter would not be acceptable for sell. The timber volume conversion factor was obtained with the Brereton formula, widely used in the logging industry.

Height: 2.2 - 4 m				
Diameter (cm)		Total	Log Volume	Total Volume
17-19			0.12	
20-24			0.14	
25-29			0.18	
30-34			0.25	
35-39			0.33	
40-44			0.42	
45-50			0.53	
	Total Height Class Volume Cu. M.			

Height: 10.1-13.0 m				
Diameter (cm)		Total	Log Volume	Total Volume
17-19			0.27	
20-24			0.46	
25-29			0.69	
30-34			0.97	
35-39			1.29	
40-44			1.66	
45-50			2.08	
	Total Height Class Volume Cu. M.			

Height: 4.1 - 7 m				
Diameter (cm)		Total	Log Volume	Total Volume
17-19			0.2	
20-24			0.23	
25-29			0.34	
30-34			0.48	
35-39			0.65	
40-44			0.83	
45-50			1.04	
	Total Height Class Volume Cu. M.			

Height: 13.1 - 16.0m				
Diameter (cm)		Total	Log Volume	Total Volume
17-19			0.34	
20-24			0.57	
25-29			0.86	
30-34			1.21	
35-39			1.61	
40-44			2.08	
45-50			2.6	
	Total Height Class Volume Cu. M.			

Height: 7.1 - 10 m				
Diameter (cm)		Total	Log Volume	Total Volume
17-19			0.2	
20-24			0.34	
25-29			0.52	
30-34			0.72	
35-39			0.97	
40-44			1.25	
45-50			1.56	
	Total Height Class Volume Cu. M.			

Height: 16.1 - 20.0 m				
Diameter (cm)		Total	Log Volume	Total Volume
17-19			0.42	
20-24			0.7	
25-29			1.06	
30-34			1.49	
35-39			1.99	
40-44			2.56	
45-50			3.21	
	Total Height Class Volume Cu. M.			

Figure 3: Recording tables by height class and volumetric conversion used to obtain total timber volume of the measured trees.

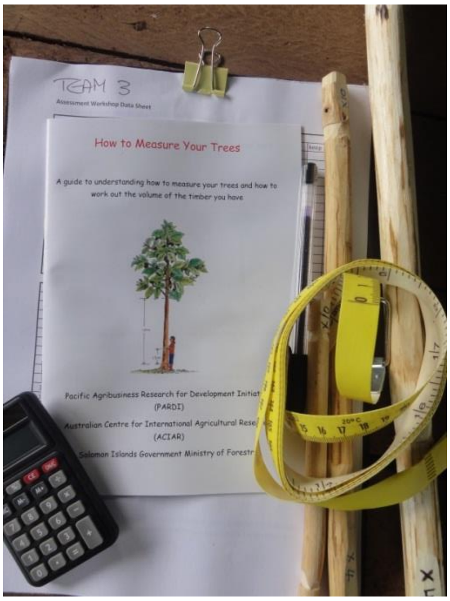

Figure 4: Material distributed to participants at the start of the workshop.

2.3 Assessment kit

Material distributed to the participants at the start of the workshop consisted of an overview of the workshop process, a simple calculator, a diameter tape, three different length sticks, a copy of the booklet, and blank tables to fill out as part of the exercise (Fig. 4). In the first table participants were asked to grade their trees according to the grading rules (grade A, B, and C) and determine which trees to leave in the ground (grade A), to thin (grade B) and to remove and use locally (grade C). The second set of tables corresponded to the volumetric tables presented in the booklet and illustrated in Fig. 3.

3 Results

In total, over 70 growers attended the workshops. Participants were not only from the localities where the workshops were organised, but came from neighbouring villages, sometimes brought by the forestry officers themselves. A maximum of 30 participants per workshop was admitted to favour interactions with the forestry officers in charge of the workshop (Fig. 5). Teams were formed by two or three participants and a forestry officer. Women occasionally joined the workshops as well.

Figure 5: Assessment workshop at Tamboka, Western Province.

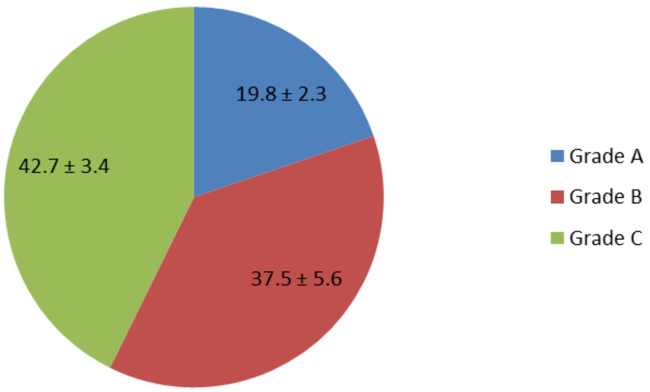

Figure 6: Proportion of trees assessed as grade A (to be kept in the ground), grade B (to be thinned and sold) and grade C (to be used because unsalable) timber.

Four plots of 16 trees were marked with flagging tape within the plantations and participants were shown how to identify and grade the trees within the plots, based on the performance of the tree and commercial timber grading rules. Each participant then took turns to measure the tree diameter using the diameter tape and the tree height using the sticks. Results from the four plots were compared and discussed at the end of the workshop, to make sure everyone understood the grading rules and to demonstrate that the measurement of tree height with a stick was accurate enough to be replicated.

Results at the four localities showed that the majority of the assessed trees belonged to grade C, which means that they would not be able to sold (Fig. 6). The trees to be left in the ground to grow on represented 19.8% of the total, which corresponds to a stocking rate of 158 trees per hectare.

4 Discussion

The most significant positive outcome of the workshops was the renewal of the cooperation and discussion between forestry officers and local growers. Due to a lack of resources, forestry officers often cannot visit the most remote communities who then feel betrayed by a government that encouraged them to plant teak 10 years ago. The involvement of local forestry officers in the workshops was therefore very beneficial and placed them as experts to whom local growers could turn to for advice and help. However, for the workshops to be truly constructive, a follow-up has to be ensured. The forestry officers therefore assured they would be visiting each locality again to answer any remaining question and go through the assessment method again if required. The long term benefits of these workshops may also be enhanced by the fact that the project in-country coordinator is now also involved in teaching forestry at the Solomon Islands National University. The university students will be the next forestry officers and it is thus advantageous to introduce them to the use of easily applicable techniques to evaluate merchantable tree stem where no clinometer is available, using locally made equipment and locally developed tables with simple timber volume conversion. The compulsory 6-week field course that the students have to attend will allow them to apply these concepts.

Growers were introduced to the concept of grading rules and were shown how these can affect the value of each log. Both the growers and the local forestry officers were surprised by the amount of trees that were classed as grade C and could not be possibly sold. The most common problems of teak trees in the plantations that were assessed were fluting and a lack of pruning. This brought forward the need for proper silvicultural practices to ensure a better quality of the timber, and many questions arose during the question session closing the workshop. The concept of silvicultural practices was not clearly mentioned in the booklet even though it constituted the basis for the timber grading rules. The booklet was therefore amended accordingly after the first week of workshops. Definition and illustration of fluted and twisted trees were added as these were timber defects that were commonly observed.

Another amendment to the booklet arose from the observation that the concepts explained in the booklet remained purely theoretical until demonstrated in the field. The use of the volumetric tables was explained in the booklet that was distributed but we needed to start filling them in with the participants for them to understand how they worked. Consequently, we modified the booklet by adding already- filled tables as worked examples to facilitate the comprehension of the process.

Finally, focus was put on the value that could be retrieved from quality logs as opposed to a larger quantity of smaller logs. The volumetric tables and a teak price list that we presented at the end of the workshop exemplified the exponential increment in the price that could be obtained from larger logs. We hope that this would be an incentive for local growers to apply silvicultural practices in order to better manage their plantations, as the current prevailing view is that trees do not require any sort of maintenance. It is still possible that growers will opt to clear-fell their plantations when a buyer comes but, through this process of assessment, they will do so with clear knowledge of the alternative options they have and with a clear idea of the potential worth of their trees.

Acknowledgements

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[BS3-4]

A study on Agroforestry in Private Forest and its Contribution to Farm Economy in Indonesia

A Case Study of Sukaresmi Village in Cianjur, West Java

Chiharu MAEDA[1], Yuei NAKAMA[2], Iin ICHWANDI[3], Masashi KONOSHIMA[4] and Bixia CHEN[5]

1 Introduction

In recent years, deforestation in the tropics has become a serious problem worldwide. One of the main causes of deforestation is development of plantation agriculture. However, there exist serious problems such as low income for farmers and the wide-spread occurrence of insect pests due to the continuous growth of only one plantation crop. Agroforestry is a combination of agriculture and forestry in space and time. Agroforestry can create more diverse, productive, profitable, healthy and sustainable land-use systems by growing trees (Westoby 1989). Also, the development of agroforestry in private forest contributed to not only increased forest cover and timber supply, but also farmers' household income (Iin 2005). Therefore, the development of agroforestry on an agricultural plantation land is significant. However, there are few studies analyzing the relationship between agroforestry and farm economies on former plantation land.

Sukaresmi village is located in the western part of Java, Indonesia. Private forest in the village has been developed as agricultural plantation land for tea. However, due to the wide-spread occurrence of diseases and the low price of tea, many farmers shifted from tea plantation to agroforestry system. A monocultural economy of plantation agriculture has developed in many tropical regions. However, it can be considered that regions using agroforestry system for the purpose of environmental conservation and diversification of revenue will increase in the future. Therefore, it is important to investigate the relationship between agroforestry and farm economies on former plantation land.

2 Materials and Methods

This study investigated the relationship between agroforestry and farm economies on former plantation land, using a case of Sukaresmi village in the Cianjur district, West Java, Indonesia.

In order to clarify the relationship between agroforestry and farm economies, we conducted

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in-depth interviews with 30 farm households, who were doing agroforestry in the private forest from July to September 2012. The agroforestry management and farmers' income were surveyed. Calculations for farm economies were performed using the NPV[(1)] only for trees, and subtracting the cost from revenue for a year for agricultural crops.

3 Results

3.1 Overview of Sukaresmi village

Sukaresmi village belongs to the Cianjur district located in West Java, Indonesia (Fig. 1). The village is at an elevation of 700 to 800m, with an area of 1940 ha. The average annual temperature is from 20 to 30 °C, and the average annual rainfall is 3,075 mm. The land use comprises the national forest of 600 ha (31%), private forest of 480 ha (25%), rice paddies of 380 ha (20%), residential areas of 300 ha (15%), and others of 180 ha (9%). National forest is located in the southeastern part and the center of the village; it is managed by Permu Perhutani. There are roads in the village; but there is no public transportation. Therefore, local people generally move on foot or by bike. As of 2011, the population of the village was 3,756, with 1,971 males and 1,785 females, and the population under the age of 17 was 1,695. The industrial population was 1,956, among which 902 were workers, 705 were farmers, and 300 were self-employed individuals.

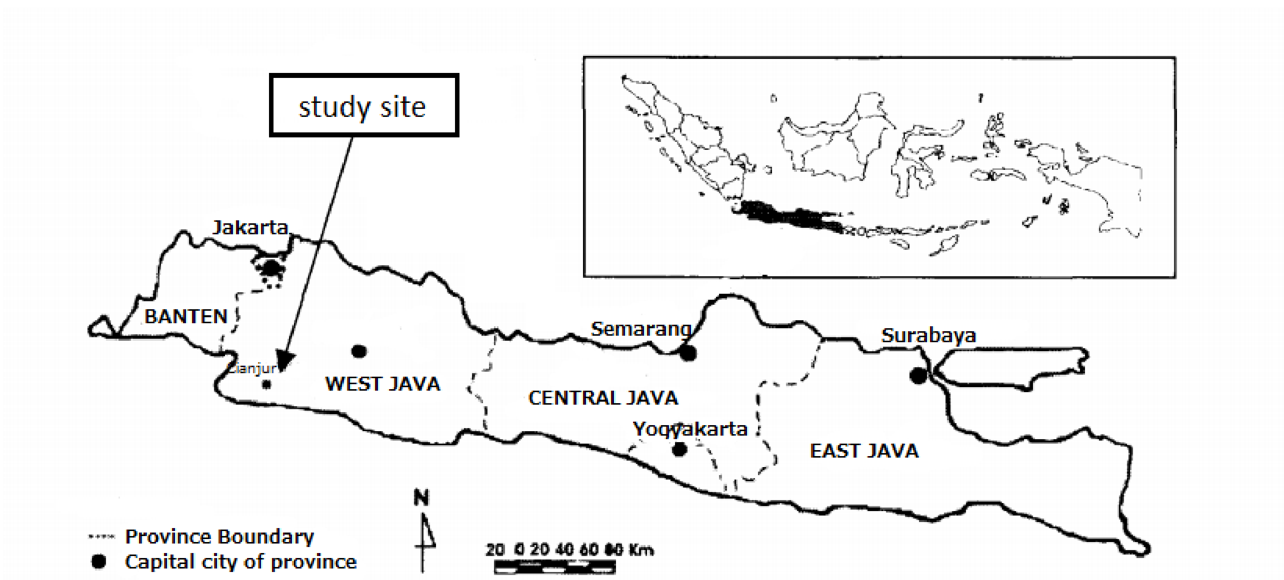

Figure 1: Map of study site in Java Island

3.2 Land use system of private forest in the agroforestry system

Management in the private forest on agroforestry system was seen various types because land use depends on each farmer. Table 1 shows different types of private forest in Sukaresmi village; i, trees (cultivated trees mainly); ii, trees + tea (cultivated trees and tea); iii, trees and agriculture crops (cultivated trees and agricultural crops); iv, tea (cultivated tea mainly); v, home garden (various species of trees and crops).

The surveyed farmers possessed around 1.1 ha of private forest in the agroforestry system on average. About 15 households had private forest less than 1 ha, 10 households had areas between 1 and 2 ha, and 5 households had areas between 2 and 3 ha. It was found that farmers own an areas less than 1ha mainly of cultivated tea (*camelia sinensis*), followed by albizia (*Paraserianthes falcataria*) and chili (*Capsicum annuum L.*). Farmers who owned an areas between 1 and 2 ha, mainly cultivated tea and albizia, followed by chili and black pepper (*Piper nigrum*). Farmers who had an areas between 2 to 3 ha mainly cultivated tea and Java cardamom (*Amomum compactum*) and chili, followed by coffee (*Coffea robusta*) and albizia. In addition, most of those who had less than 2 ha, worked by only family labor. On the other hand, farmers who had 2 to 3 ha mainly hired labor.

Table 1: Different types of private forest in the Sukaresmi village

	Type	trees	agriculture crops
i	trees	albizia etc.	-
ii	trees + tea	albizia	tea
iii	trees + agriculture crops	albizia	coffee, cassava, etc.
iv	tea	-	tea
v	home garden	surian, mango, etc.	cassava, chili, etc.

Source: Based on field research, 2012.

3.3 The agroforestry contribution to farmer households

The total household income was Rp.23,321,606 per year (US$1=Rp10,000) on average, and average income from agroforestry was Rp.6,497,466 per year, accounting for 28% of their total household income. In terms of the contribution of income from agroforestry to farmers' income, it can be categorized into three types of more than 50% (Type 1), 20-40% (Type 2), and less than 20% (Type 3). There were 11 households belonging to Type 1, meaning that their income highly depended on revenue generated from agroforestry, and they grew various crops different from the other types. In addition, there were 9 households of Type 2, many of whom grew tea. There were another 10 farm households of Type 3. Nine of them responded that they would not continue tea cultivation because the labor input and tea management costs were high. It is expected that the farmers of Type 3 will shift to the use of private forest for woody plants mainly in the near future. In addition, for the eight full-time farm households, income from agroforestry was, which Rp.5,487,223 per year, accounted for 75% of their total household income.

3.4 Harvesting and selling system in the private forest

Tea was harvested every 14 days. Harvest is possible throughout the year, but the crop yields are high during the rainy season (from October to March). Brokers bought tea at Rp.1,750 per kg from farmers, and sold it to a processing plant in the village for Rp.2,000 per kg. This processing company sold the processed tea to companies outside the village. Middlemen bought other agricultural products such as cassava and banana from farmers, and sold these to markets outside the village. Trading prices of each crop are shown in Table 2. Some farmers sell directly to the small shop in the village.

Farmers sold timber to brokers when the trees were still standing. Brokers harvested and transported the trees, and turned them into lumber in the sawmill in the village, and sold this to

Table 2: Trading price of each crop in the Sukaresmi village

crop	Scientific name	Selling price to the broker from farmer (Rp. / kg)
Java cardamom	*Amomum compactum*	40,000
coffee	*Coffea robusta*	6,000
chili	*Capsicum annuum L.*	5,000
banana	*Musa sp.*	1,000
cassava	*Manihot esculenta*	600
corn	*Zea mays*	3,000
black pepper	*Piper nigrum*	30,000
ginger	*Zingiber officinale*	6,000

Source: Based on field research, 2012.

Table 3: Trading price of white trees such as albizia and musizi

Diameter(cm）	Selling price to the broker from farmer(Rp. / m^2)	Selling price to the sawmill from farmer(Rp. / m^2)
10-15	300,000	350,000
15-20	350,000	350,000-Rp.400,000
20-25	400,000	400,000-Rp.550,000
25-30	400,000-Rp.500,000	550,000-Rp.650,000
Over 30	500,000-Rp.550,000	700,000

Source: Based on field research, 2012.

Table 4: Trading price of red or yellow trees such as surian and mahogany, teak, rasamala

Diameter(cm）	Selling price to the broker from farmer(Rp. /m^2)	Selling price to the sawmill from farmer(Rp. / m^2)
10-15	400,000	500,000-Rp.550,000
15-20	450,000	550,000-Rp.600,000
20-25	500,000	600,000-Rp.700,000
25-30	550,000-Rp.650,000	700,000-Rp.850,000
over 30	700,000-Rp.800,000	850,000-Rp.1,000,000

Source: Based on field research, 2012.

companies or individuals outside the village. Trading price of trees sold to timber broker or the sawmill are shown in Table 3 and Table 4. The trading price is different depending on the color of the timber. White timber such as albizia and musizi (*Maesopsis eminii*) is cheaper than red or yellow timber such as mahogany (*Swietenia macrophylla*) and surian (*Toona sureni*). These woods are used for window frames and roofs.

4 Discussions

According to farmers in the research area, trees were commonly harvested when they were 4 to 10 years old, and farmers obtained Rp.7,259,601 per harvest on average. Income from trees was not suitable as the main income source and did not contribute to farmers' households. However, trees had an important role in farmers' households, for example, which they need big cash for an emergency situation.

Many farmers of Sukaresmi village grew albizia mainly as a woody plant. Albizia is a multipurpose tree, playing roles such as timber, shading tree, soil fertilizing. Also, its leaves are used as fodder for goats. In addition, albizia was selected because it is a fast-growing species. In Sukaresmi village, albizia could be harvested 4 years after being planted.

Average income from agroforestry was accounting for 28% of their total household income. It can be concluded that agroforestry contributed to farm economies, especially for full-time farmers. However, there are only 30 households' data in this study; it is difficult to determine if the land use of private forest in agroforestry is efficient. More farmers' income and land use data are required to clarify efficient agroforestry.

Some farmers who cultivated only tea wanted to introduce other crops and trees for the purpose of increasing the revenue, but they did not know how to plant or grow them. Currently, the management of private forest depends on each farmer. It is necessary to implement training in the agroforestry system for the farmers by the government or village office.

5 Conclusion

The surveyed farmers possessed around 1.1 ha of private forest in the agroforestry system on average. It was found that many farmers were planting a combination of tea, trees and other crops. The total household income was Rp.23,321,606 per year on average, and average income from agroforestry was Rp.6,497,466 per year, accounting for 28% of their total household income. For only eight full-time farmer households, income from agroforestry was Rp.5,487,223 per year, accounting for 75% of their total household income.

The brokers bought tea for Rp.1,750 per kg from farmers, and sold it to a processing plant in the village for Rp.2,000 per kg. Middlemen bought other agricultural products, such as cassava and banana from farmers, and sold these to markets outside the village. Farmers sold timber to buyers when the trees were still standing, and obtained Rp.7,259,601 per harvest on average. Trees are very useful as a source of cash income on emergency situations.

It can be concluded that agroforestry contributed to farm economies, and the diversification of farmers' income in Sukaresmi Village.

FootNotes

(1) NPV was calculated based on the following equations;

$$NPV = \sum_{t=1}^{n} \frac{Bt-Ct}{(1+i)^t}$$

Where: Bt=Benefit from trees
Ct=Cost from trees
i =Discount rate
t =Years period (*i*=1,2,3…*n*)

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[BS3-5]

History of School Forests in Minami-Oguni, Kumamoto Pref., Japan.

TAKEMOTO Taro[1]

1 Introduction

Among numerous institution changes in rural villages after Meiji restoration ended Edo period, introduction of the modern education system was one of the most essential thing for residents of villages. School forests were settled and managed by residents in order to cover costs for an adequate quality of education, which was not existed in Edo period.

Now in Japan, we can find 3,057 schools holding forests. These forests are called school forests. Whole area of school forests is 20,106ha (the number of primary schools is 1859, and the area is 7,009ha). This is 7.8% of all primary, junior high and high schools (8.1% of all primary schools) (Kokudo Ryokka Suishin Kikou, 2007). However today most of the school forests are not used and those histories are almost forgotten. This paper aims to depict how communities have managed school forests. Firstly, the brief history of school forests policies is surveyed. Next, the relation between communities and forests is considered from the case study of Minami-Oguni, Kumamoto Pref. where school forests have lasted since Meiji era.

2 The Brief History of School Forest Policy

2.1 Establishment of School Forests in Meiji period (Takemoto, 2004)

In the very early period, school paddies and school forests were introduced as a way of making a school fund. Though most of them were set on lands owned by hamlets, some of them were set on lands sold by the Meiji government. In this period number of school paddies was larger than that of school forests. Especially in Aomori Prefecture, school paddies developed considerably.

Because of the Town and Village Act 1889, About 75,000 hamlets were consolidated to 15,000 administrative villages. As new administrative villages carried responsibility to establish primary schools, hamlets lost the right of establishing their schools, but still had a lot of real estates used as communal properties called iriai forests. This is because the Meiji government didn't unify real estates under compulsion when it consolidated the hamlets. In 1890, the school fund was made possible by the enactment of the Rural Education Act. Thanks to the act it was able to set up school forests as a way of making the school fund. Because administrative villages didn't own lands for themselves, they used hamlets' lands when they set up school forests.

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With the "The School Arbor Day" instruction told by Nobuaki Makino, who was the Vice-Minister of Education, as a trigger, establishment of school forests became widespread all over the country. The Arbor Day was first established in Nebraska, the United States in 1872 by Governor Morton because of the restoration of devastated land. Then B. G. Northrup, the chairman of the board of education in Connecticut State, came to Japan in 1895 and did a lecture tour on the School Arbor Day which was developed from Morton's Arbor Day. Makino was affected by Northrup's lecture. In the course of top-down spread, Makino's School Arbor Day was tied up with the school fund institution.

Still administrative villages didn't own enough lands for School forests. To solve this problem Meiji government started to sell unreserved national forests to administrative villages. Meanwhile, three major acts related to forests were enacted, which prescribed the sale of unreserved national forests. Until 1906, number and area of school forests set up by using national state forests increased.

When the Russo-Japanese War broke, Ministry of Education further promoted to set up school forests with Division of forest, Ministry of Agriculture and Commerce. The Division of Forest thought that school forests were important to propagate their afforesting policy. That is why school forests were increasing in number and area in this period. And 2,968 school forests (7,200 ha) were set up by using unreserved national forests in 1906 at the peak. However, according to the case studies, many school forests whose landowners were hamlets or individuals were found.

Rural governments were put in financial difficulties because of the expenses for education which was caused by the compulsory education extended from 4 years to 6 years. Therefore the Ministry of Interior started the rural improvement project. In this project the Ministry wanted to make administrative villages sound in financial aspect, at the same time keeping order of hamlets. So the Ministry approved to unify hamlets' forests to school districts which existed between hamlets and administrative villages. Additionally, Sale of unreserved national forests to administrative villages continued in this period.

Fundamentally the school fund institution was an "excuse" by the Meiji government for getting corporation of hamlets. However, school forests in this institutional framework made plural hamlets reorganize into one community. As the result of reorganization, a community whose basis was school forests was born.

2.2 Establishment of School Forests in Meiji period (Takemoto, 2004)

The communal relations established school forests as its self-governing function when the modern education system was introduced. Until the commemorative forestation for Taisho Imperial accession, school forests were established for the purpose of forestation and making school funds. Mostly, in the community of this time we can find several organizations such as a young people's association, a local fire brigade, an alumni association and a local credit cooperative. However, as to forestation and management of school forests, hamlets or school districts played active role as before. When the government started to expend money on compulsory education from 1918 and on forestation from 1920, purpose of school forests turned to be relatively unimportant.

The Great Depression in 1929 led Japan's rural communities to impoverished condition. In such context Dai-Nihon Sanrinkai, the association for Japan's forest started "Forest Loving Day" from 1934 with reference to the commemorative tree planting which had been implemented in colonial Korean peninsula since 1911. Otosaku Saito, the chief of forest division of the Government-General of Chosen introduced the commemorative tree planting with reference to Makino's School Arbor Day and succeeded to turn devastated mountains into green.

Under the national mobilization system which was started in 1938, the central government started to hold Forest Loving Day and take school forests forestation as useful apparatus in order to infiltrate the Emperor system. The young men's associations which were set up as self-governing functional organizations were promoted to be an administration-governed organization when the government regarded afforested school forests as national resources for the 2nd World War. To change such communal relations, there was "Hometown patriotism" logic which converted the spirits of loving hometown into patriotism. To put it in other words, tree planting and school forests are utilized as intermediation between loving hometown and patriotism.

2.3 Restructuring of School Forests in the Showa Postwar Period and the Present (Takemoto, 2006)

The communal relations around school forests, which were born in the Meiji period (1868-1912) or the early Taisho period (1912-1926), can be called "Property communal relations". However, when national mobilization system was started, they have changed themselves into "Patriotism communal relations".

There were three actors in connection with resuming Forest Loving Day and school forests. The actors are GHQ/SCAP, bureaucrats and communities. GHQ/SCAP considered that "Forest Loving Day" and school forests could alleviate social anxiety existed immediately after the 2nd World War. The Japanese nation felt uneasy because it has lost the absolute Emperor. Owners of forests also felt uneasy because of the possibility of forest emancipation. However, to make the Emperor as a ceremony master on Forest Loving Day alleviated first anxiety and the 1st School Afforestation Plan 1949-1951 along with the other forestation movement alleviated the second. Actually bureaucrats proposed resumption of Forest Loving Day and School Afforestation to GHQ/SCAP because they wanted to keep their system and organization. Therefore they emphasized that Forest Loving Day was first introduced from the United States, that is B.G.Northrup's School Arbor Day and that a tree-planting campaign has nothing to do with the war campaign. On the other hand, communities needed fund to build their new schoolhouses especially for junior high school which was introduced under the new school system in 1947. During postwar rehabilitation, Forest Loving Day and School Afforestation encouraged communities physically and mentally. Thus "patriotism communal relations" were strengthened autonomously.

Accompanied by the consolidation of villages and towns from 1958, usually property rights of school forests owned by municipalities went to new municipalities or new property wards (Zaisan-ku) which were settled in order to manage former municipalities' properties such as forests. However, property rights of some school forests went to other ways. For example Matsuo ward in Nagano prefecture set up a new property ward to keep its school forest only. Takase school forest in Oita prefecture was established as hamlet's forest before Takase administrative village's forest was established. As the symbol of administrative village's consolidation, school forest has moved to the Takase Forest Producer's Association together with other village's forest. Property rights of Aihara school forest in Tokyo metropolitan prefecture established in the Meiji period finally went to a legally incorporated foundation. Residents of Aihara regarded school forests as the symbol of public welfare. Concluding from these examples, "Patriotism communal relations" insisted that they have managed their school forests for public welfare. Thus, they prevented their school forests from unifying into new municipalities or returning to property communal relations, by fitting them into the other legal framework, such as incorporated foundation. They turned to be "Public welfare relations".

Japan became independent from GHQ/SCAP in 1951, then, the 2nd School Afforestation Plan was started. However school forests have lost its role as school funds because subsidies for education and forest management were already provided to new municipalities. Therefore only a peaceful image of tree planting was left. Most of school forests have faded out into municipalities' fund ordinances from the mid.1960s to the mid.70s. Increasing interest in destruction of nature since 1970s, school forests were regarded as fields of environmental preservation and education. From the late 1990s, municipalities, prefectures and the state started new institutions to settle school forests for environmental education.

3 The School forest in Minami-Oguni, Kumamoto Pref.

3.1 Survey of Minami-Oguni Town

Minami-Oguni Town is located in northern part of Aso area, Kumamoto pref., the upper reaches of the Chikugo river, 68km from the center of Kumamoto City. After the Meiji restoration, 25 villages consolidated into 9 villages in 1870. Then southern 3 villages became Minami-Oguni village and northern 6 villages became Kita-Oguni village when Town and Village Act was enforced in 1889. Kita-Oguni village and Minami-Oguni village became a town in 1935 and 1969 respectively. Without consolidation, Minami-Oguni town has been composed of 3 sections since 1889: Akababa, Manganji and Nakabaru.

Town forests cover the area of 3,106ha including school forests of 68.48ha. There aren't any school forests except for town forests. At the time of March, 2004, all 5 schools in Minami-Oguni had school forests. Schools were Ichihara primary school in Akababa section, Nakabaru primary school in Nakabaru section and 3 primary schools (Manganji, Kurokawa and Hoshiwa) in Manganji section. And each primary school district was consited of local communities called "Buraku". There were 31 Burakus in Ichihara school district, 7 Burakus in Nakabaru, 4 in Managanji, 6 in Kurokawa and 3 in Hoshiwa. And also, each school district has School Supporters Association called "Kouenaki" in which every household needs to participate. "Kouenkais" had been organized in order to manage their school forests and to support their schools. In addition, 3 schools in Manganji section were integrated and became Rindo-ga-oka primary school in April, 2004. In this paper I mention 5 schools before this integration.

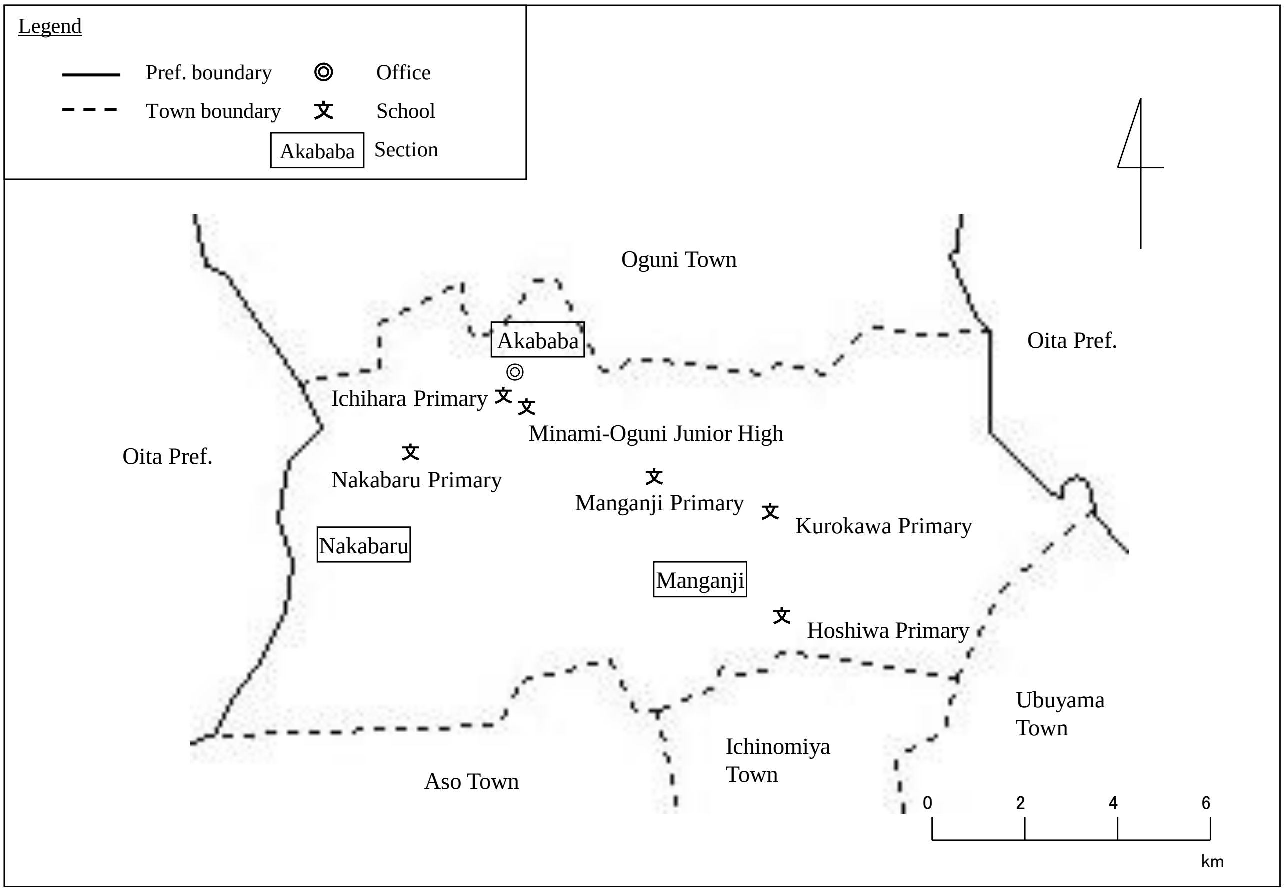

Fig. 1 Map of Minami-Oguni, Kumamoto

3.2 Establishment of School Forests

Oguni, Kumamoto pref. is one of the most famous regions where private forestry had developed in the early Meiji Period, such as Tenryu in Shizuoka pref., Shitara in Aichi, Kitou in Tokushima, Kanayama in Yamagata and Kuma in Ehime.

Hashimoto Bujiro who took the lead in afforesting Minami-Oguni village forest, attempted for the first time "Yoshino forestry method" in Oguni region in 1895 and afforested for the school funds in 1895, then he established the Oguni Forest Association in 1896. On March 27th 1911, a proposal for afforesting the town forests as permanent property was adopted unanimously at the extraordinary village council held on the open field near Shimoougahara. In response to the decision 4 leading figures including Hashimoto together with 146 other residents offered the fields and mountains of 20 Cho 6 Se by registered area (about 60 ha by actual measurement, as much as approximately 293 thousand yen) and paddies of 1 Cho 5 Se to the town. This is considered to be the origin of Minami-Oguni village forests (Hashimoto, 1923). According to another document below, this council also demanded villagers to offer School forests.

"Every primary school in this village owns school forests (Gakurin). The afforestation of school forests was started in Meiji 35 (1902). The leading figures offered to donate nursery-trees of cedar and cypress. The village accepted this offer and purchased the private land in Shimoougahara to plant the nursery-trees. In Meiji 44, at the council held on the open field near Shimoougahara the invitation of donation for the school funds was decided. As the result of that the committee members accepted the invitation, these school forests (Gakurin) were made by the donation with conditions attached from the leading figures of each Burakus. The areas of school forests of each school are below. 1. Nakabaru Ordinary High Primary School, 20 Cho 75 2. Ichihara Ordinary High Primary School, 9 Cho 84 3. Hoshiwa Ordinary High Primary School, 10 Cho 56 4. Haibaru Ordinary High Primary School, 2 Cho 59 5. Shizu Ordinary High Primary School, 2 Cho 64 Total, 46 Cho 38." (Sanrinkyoku, 1938)

At the council held for village afforestation, the donation for school forests was also invited. As a result totally 46 Cho 3 Tan 8 Se Bu (thought be the actual measurement area) were offered as school property. Settlement of school forests in this village was thought to be started from this council.

Table 1. Situation of School Forests of Hoshiwa Primary Shool

Place	Area (ha)	Species	Age of Tree (research in	Ownership at donation	Remarks
Higashi-Ekai	0.34	Cedar	46,48		
Ekai	0.23	Cedar	44	Private, Common	Former meadow
Ekai	3.15	Cedar	36,42,46		Former meadow
Ekai	0.25	Cypress	79		
Ekai	—	—	—	Private	Planted in 1955
Ekai	0.80	Cedar	41		
Hitotsudo	0.22	Cedar	46	Private	Planted in 1955, Former firewood forest
Minamitani	1.80	Cedar	—	Private	Planted in 1956, Former firewood forest
Minamitani	0.43	Cedar	23	Private	
Minamitani	0.69	Cedar	5-6	State	Former timber forest
Minamitani	1.65	Cedar	15,25,33		
Minamitani	0.15	Cedar	43		
Hoshiwa	2.52	Cedar	43,45,72	Private	Former firewood forest
Nagayama	0.33	Cedar	58	Private	Planted in 1953
Yanagimoto	2.78	Cedar	47	Private, Common	Planted in 1952
Yanagimoto	0.15	Cedar	25		
Yanagimoto	0.10	Cedar	43	Private	
Nishi-	0.12	Cedar	39	Private	Former paddy
Kuzureyama	0.35	Cedar	26	Private	Former timber forest, planted in 1953
Fukakubo	1.67	Cedar	33,36	Common	Former meadow
Fukakubo	0.35	Cedar	46		
Maitani	0.39	Cypress	60-70	Private	Former slash-and-burn forest
Noharada	0.04	Cedar	30-40	Private, State	Former slash-and-burn forest, planted in 1955
Higashi-	0.08	Cedar	25-60	Private	Former firewood forest, planted in 1956
Hoshiwa	0.15	Cedar	25-60	Common	Former meadow
Hoshiwa	0.40	Cedar,	25,30,35		
Minamitani	—	Cedar	—		
Higasyi-	—	—	—	Private	
Onokakushi	—	—	—		
Yanagimoto	—	—	—	Common	

Reference: This table was prepared according to "Register of Hoshiwa school forests" and materials kept in Hoshiwa primary school

Just after the council, the era changed from Meiji to Taisho so that the commemorative afforestation for Taisho Imperial Accession was implemented all over the country. Along with this, afforestation of school forests was also encouraged and Minami-Oguni village also implemented. As the result both the village funds and the school funds increased. According to the research in Apr.

1921, it recorded that the village funds were "Forest" of 60 Cho settled in Meiji era and 32 Cho 9 Tan 3 Se 21 Bu newly purchased in Taisho era, "Paddy" of 1 Cho 5 Se, "Bill" of 3640 yen and "Cash" of 8357 yen, and that the school funds were "School forests" of 59 Cho 7 Tan 7 Se 28 Bu. The items of "School forests" were "cedar and cypress woods of 27 Cho 5 Tan plus commemorative woods" for Ichihara primary school, "cedar woods of 19 Cho 3 Tan 5 Se" for Nakabaru primary school, "cedar woods of 1 Cho" for Shizu primary school, "cedar woods 8 Tan 8 Se plus Kunugi coppice woods" for Hoshiwa and "woods of 1 Cho 2 Tan" for Kurokawa primary school. (Hashimoto, 1923)

In the table 1, a lot of small-scale school forests of Hoshiwa primary school can be found (as same as other school districts). According to hearing to the residents, this is because leading figures of each Buraku in the school district composed of 5 Burakus donated their private or common lands depending on the amount of properties. In reference to the remarks column most of school forests used be meadows and firewood forests. In most cases, the ownership of the property was "private" or "common" when it was donated. Actually in the materials names of donators are listed for each school forest so that "private" means just one name listed and "common" means more than one name listed. Consequently, lands had been remained owned by leading figures when they were donated as school forests. However, through the afforestation and management by the Kouenkai or the school district, the ownership was transferred gradually to village (or town later). According to the interview to the residents, fields and forests were collected from leading figures of 5 Buraku in the school district respectively depending on the amount of the property in an equitable manner so that a lot of small-scale school forests were settled.

3.3 Organization for Management of School Forests

Hoshiwa primary school keeps the document "Hoshiwagakkou Kihonrinn no Ki" (Diary of Hoshiwa school forests) written in 1930s. This document shows when the "Kouenkai" was established and what was the role. A draft of "Oath" transcribed in the document is a kind of declaration when school forests were first established in 1906. According to the draft it turns out that a leading figure "Ii Kaita" together with the schoolmaster "persuaded volunteers from Burakus of the school district the importance of school forests". Thanks to "money and real estates" donated by volunteers and school forests "planted, replanted and mowed by volunteers", "school buiding extension, playground expansion and stone wall construction" was achieved. Also coppice woods out of donated lands turned to Sugi (cedar) woods, Hinoki (cypress) woods and Kunugi (sawtooth oak) woods and other "unforested land" turned to forest for production. "Volunteers ought" to attend the management work such as mowing and protection "by using their own money". The draft also said that the property from school forests must have been used for purchasing "school supplies" and "lab wares and reference books" which were not paid out of the village expense.

In 1930, it was decided by "Hoshiwa Yugaku committee" that making "forest management register book" was needed along with renewed objective: "cherish school forests and accumulate more property". This is the objective of the document "Hoshiwagakkou Kihonrinn no Ki". Namely the document clearly stated that the way of conventional management by volunteers who donated school forests was changed to its of new management by school forest management organization composed of all households in the school district.

According to the document "Hoshiwa Koenkai no Ayumi"(A brief history of Hoshiwa Kouenkai) which described work and organization of Kouenkai from 1927 to 1975, "Yugaku committee" the former organization of the Kouenkai had managed not only school forests but also every local work related to the school like schoolhouse construction, purchase of school supplies, water-supply works, gymnasium construction and playground maintenance. For example, timbers of Kunugi logged from a plot of school forest were put out to tender in 1927. In Aug 1931, all households of the school district (20 households from Hoshiwa Buraku, 24 from Yoshihara, 4 from Sohara, 8 from Yakabe and 15 from Nagayama, totally 80 households) took part in mowing of school forests compulsory. "Riji" (director) took a responsibility to report the accounting such as cost of forest management and "Kanshi" (audit) took a responsibility to make the register book and collect forest management cost from households (50 Sen each household, Sen is one hundredth of Yen).

Along with the revision of regulations in April 1943, school forest management organization changed its name from "Yugaku Committee" to "Kouenkai". There newly settled 4 main posts of the Kouenaki: "councilor", "president", "vice-president" and "director", which were nominated by each Buraku. After WWII, the most important task for Kouenkai was new schoolhouse construction in 1951 and its extension in 1956. For new schoolhouse construction, sale of school forests timbers was approved at the "General Meeting of the School District Residents". For schoolhouse extension, sale of timbers was unanimously adopted in the Annual Executive Committee, then the number of "Kanshi", just one posts at that time, was changed to three which were allocated to each Buraku (Hoshiwa, Yohishihara and Yakabe, the number of Buraku decreased because of depopulation), and whose name was changed to a "School Forest Management Committee-man" at the Extraordinary General Meeting in 1954. Next year, every household needs to supply one hundred nursery trees and workers from each Buraku to replant school forests. Though it was not recorded, mowing must have been executed every year like replanting for which each Buraku needed to offer workers. In 1967 the number of School Forest Management Committee member was doubled to 6 (2 from each Buraku). Workers must have paid the fine (1,000yen for absence, 200yen for substitute by woman) when they were absent from afforestation work. In addition, fix of the boundary (in 1972) and investigation of forest (in 1974) were carried out by Kouenkai. School forests had been managed by Kouenkai together with all the school district since "Yugaku Committee" era up to 1975.

From the research of Nakabaru primary school, present situation of Kouenkai could be known. According to the trend of the sale of thinning timber from school forests 1976-2003, a large-scale felling was executed to purchase the school site which had been leased in 1986 and 87. 2 million yen, a total sale of Dec 1986, Mar, Apr, Aug 1987 was first "donated" to town, then town used it for purchasing the school site. Small-scale felling could be confirmed in almost every year and every year 330 thousand yen as subsidy has been offered to the school from the sale profit.

Every way of using the sale profit and way of management is decided by the Koenakai. School forests are owned by town so that the Kouenkai needs to report the result of felling and sale to town. However, there is no guidance and participation by town when the Koenkai decides the way. All the profit from school forests is put into the account of Kouenkai but not into those of town. Only when town implement projects like schoolhouse building, Kouenkai first "donates" the profit to town, then town adds it to the town forest account before expense. Truly, sometimes such formal "donation" is needed, but school forests is said to be owned by the Kouenkai or Nakabaru school district actually.

In Nakabaru section there exist town forests managed by other organization such as Afforestation Association and Pasture Land Association which are composed of residents living in part of the Nakabaru section. In addition, Nakabaru section itself owns no forests so that school forests are the only town forests managed by whole Nakabaru district [Table 2]. Today, all works related to school forests are executed by residents of the school district as volunteer works, namely the absence penalty is not imposed as it used be. Furthermore Kouenaki is searching for the new way of using school forests; for example, the field of environmental education in the curriculum of school studies and club activities.

Table 2. Sales of Woods from School Forests.

Time	Price(Yen)	Place	Time	Price(Yen)	Place
1976 May	448,265	Iguchiyama	*1987 Mar	6,000,000	
June	171,764	Iguchiyama	Apr	100,000	Iguchiyama
Dec	15,000	Kunugi woods	*Apr	5,635,000	
1977 Mar	4,038,411	Yokomichi	*Aug	1,713,000	
Mar	83,035	Iguchiyama	1989 Sep	205,070	Yokomichi
Aug	15,000	Kunugi woods	1990 Oct	327,421	—
Nov	94,997	Iguchiyama	1991 Jan	652,738	—
Dec	3,000	Kunugi woods	Mar	476,451	—
1979 Nov	373,464	—	1992 Apr	74,527	—
1982 Sep	341,860	Yokomichi	Dec	568,501	—
1983 May	181,692	Kamiutsuogi	1993 Mar	79,934	—
Oct	1,791,819	Iguchiyama	1997 May	475,651	Tsutsuisako
1984 Mar	86,060	—	1999 Apr	1,399,194	—
Aug	20,000	wind-fall trees	apr	59,221	—
1985 May	275,430	—	2002 Oct	178,928	Yokomichi
Dec	968,365	—	2003 Jan	34,764	Yokomichi
1986 Mar	1,114,992	—	May	115,764	Yokomichi
Apr	358,789	—	Nov	644,445	Iguchiyama
*Dec	6,250,000				

Reference: This table was prepared accoridng to materials of Nakabaru primary school Kouenkai (2003)

Note: * Sales of woods for purchasing the school site

Next, materials of Ichihara School Kouenkai shows role of the subsidy for school. First, this Kouenkai doesn't collect the annual membership fee at all. Members those who engage in forestry log and carry out trees voluntarily so that all the profit is put into the Kouenkai accounts from which management cost and the subsidy for school are expended. Looking at the trend of the school subsidy from 1998 to 2003 [Table 3], the amount of subsidy, which was 1.2 million yen in 1998, started to decrease gradually from 2001. In the past, Kouenkai expended 909 thousand yen in 1978, 732 thousand yen in 1973 and 743 thousand yen in 1980 (Tsutsui, 1981). Also, the Kouenkai expended 6.75 million yen for purchasing the school site and 5.7 million yen for schoolhouse construction in 1970, and 3.93 million yen for a swimming pool construction in 1973. Along with variation of school education the Kouenkai subsidizes; for example, we can find in the items of the expenditure that "Local education support" has expended 50-100 thousand yen a year since 2000. In order to respond to such variation, communication between Kouenkai and teachers is essential so that intimate relation-building is needed through convivial meeting, farewell party and so on.

4 Conclusion

Although school forests have been settled and utilized in response to the needs of the times since Meiji era, most of them have vanished under the influence of village consolidation or educational cost burden. However, why has Kouenkai continued to prevent school forests for a long time in Minami-Oguni?

In Minami-Oguni, huge funds for many school facilities like schoolhouses and for purchase of school goods has been produced from school forests which was established by planting trees on the field donated by leading figures of Burakus from the end of Meiji era to the early Taisho era and their holders were transferred to Town (or village) gradually. Today, though the holder of school forests ownership is Town, full authority is given to Kouenkais actually. The Kouenkai is the organization composed of all households in the school district and managed by representatives of Burakus, which can connect Town and Burakus. Consequently, very strong connection is maintained through the management activities of school forests by all households in the school district.

There are three key factors to consider for long-lasting school forests. Firstly, from the viewpoint of structure of administrative district, triple structure composed by Burakus, school district and Town (or structure in which school district is existed between Buraku and Town) has been maintained since Meiji era. This made school district reliable and school forest dependent from properties of Burakus or Town. Secondly, taking management organization into consideration, the Kouenkai composed of all household was established by mainly leading figures who donated their properties to their school and has been maintained as an apparatus for collecting Burakus' opinion. Namely, School district was no more than an alliance of several Burakus regarded as hamlets or commons. However, the management activities of school forests made school district cooperate like "new commons" which became the Kouenkai. Lastly, from the viewpoint of the yield of logging, it is considered that residents always think of school forests as valuable because they can receive subsidies every fiscal year from the profits of regular logging.

Consequnetly there still exist school forests because of the particular factor of Minami-Oguni which has not experienced consolidation since the Meiji restoration, and is famous forestry region which can produce good quality cedar. Additionally the Kouenkai organization which has both merit of property ownership by Town and that of management by Burakus was born to establish "new commons" and therefore school forests were survived.

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[CS1-1]

Perceptions and attitudes of private forest owners as related to energy wood supply and their relevance for European bioenergy sector

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1 Introduction

Excluding the Russian Federation and some of the eastern European countries, more than half of Europe's forests are privately owned (EUROSTAT 2011; Schmithüsen and Hirsch 2010). Private ownership includes forests owned by individuals, families, communities, companies, religious bodies, and other private entities. Among these diverse groups of private forest owners, forests owned by individuals and families dominate. It is, however, difficult to arrive at an exact number of small-scale private forest owners in Europe. Schmithüsen and Hirsch (2010) estimated that there were more than 4 million small-scale private forest owners in nine European countries in 2007, with an average forest holding of less than 5 ha. However, there is a difference between the total number and the average area of forest parcels. This type of private forest owners is also known as a 'non-industrial private forest owner' or NIPF and they are central to this paper in the context of the energy wood supply from their forest estates to the European bioenergy producers.

The EU (European Union) has set a target of achieving 20% renewables in its primary energy mix by 2020 under the Renewable Energy Directive (RED), and it is expected that biomass, particularly forest biomass, will play an important role in the renewable energy production of many of the EU Member States by 2020. For instance, the use of wood fuels, particularly wood chips, has been projected to increase in Finland to meet the country's target of 38% renewables in total energy consumption by 2020 under the RED (Oikari et al. 2010). On the other hand, countries such as Croatia and Serbia, which are members of the Energy Community Treaty of the EU, will follow developments in the EU's energy sector to formulate their own energy strategies. For instance, Croatia adopted a national "Energy Development Strategy" in 2009, which aims to produce 35% of its electricity from locally available renewable sources by 2020 and forest biomass is considered an important source for meeting that target (Delomez 2012). Similarly, forest biomass has been identified as one of the largest potential sources of renewable energy production in Serbia (Stojiljkovic 2011). It should be mentioned here that Croatia gained EU membership from July 2013 while Serbia is an EU 'candidate' country,

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which means they soon have to accept the EU targets under the RED and implement their renewable energy strategies accordingly.

Statistics suggest that NIPFs own 60% of the forest land in Finland and supply 80-90% of the domestic roundwood used by Finnish forest industries (Favada 2007). In addition, they also play an important role in supplying forest biomass to the domestic bioenergy producers who use forest residues and small diameter trees for energy production. There were approximately 740 000 NIPFs in Finland by the end of 2008, owning forest areas larger than 2 ha, while their national average forest holding stood at 24 ha (Finnish Forest Research Institute 2009). However, the situation in Croatia and Serbia regarding NIPFs and their contribution to the domestic forest-based industries is completely different. Private forests in Croatia and Serbia are characterized by high fragmentation into small parcels which have poor growing stock compared to the state forests (European Forest Institute 2011). Recent statistics show that there are about 600 000 NIPFs with an average forest holding size of 0.76 ha in Croatia (Statistical Yearbook of the Republic of Croatia 2012), whereas about 900 000 NIPFs own an average 1.27 ha of forests in Serbia (Statistical Office of the Republic of Serbia 2012).

In recent years, both Croatia and Serbia have started participating in various European bioenergy projects, with an emphasis on energy wood production from forests owned by NIPFs. Nevertheless, there has not been a study which evaluates the perceptions and attitudes of the NIPFs in these countries, as related to energy wood production. On the other hand, Rämö et al. (2009) found from their study that Finnish NIPFs were positive about selling energy wood from their forest estates, although they were concerned over the loss of soil nutrients from excessive harvesting of energy wood. Exploring the perceptions and attitudes of NIPFs in Finland, Croatia, and Serbia, concerning energy wood production, could therefore provide valuable background information for enhancing the possibilities of energy wood supply from the private forests in these countries. In this regard, Halder et al. (2012) stated that an understanding of the perceptions and attitudes of NIPFs, as related to energy wood supply, would be crucial for creating a sustainable wood supply mechanism for energy production in various parts of the world where NIPFs own large areas of forests. Moreover, by comparing the perceptions and attitudes of NIPFs from these countries, which are at different stages of development in forest-based energy production, a number of key attributes of the social dimensions of energy wood production can be understood that will be relevant for policy makers and bioenergy producers in Europe. The main objectives of the study are therefore to: (1) explore and compare the perceptions and attitudes of NIPFs in Finland, Croatia, and Serbia, as related to energy wood supply from their forest estates, and (2) provide recommendations for policy makers and bioenergy producers to improve the preconditions for NIPFs' active participation in energy wood mobilization from their forests.

2 Method and data

The study used data from questionnaire-based surveys that were conducted among NIPFs in Finland, Croatia, and Serbia. The surveys were conducted as part of two large European projects related to sustainable forest management and bioenergy production in a number of EU and non-EU countries. The Finnish data was obtained from 79 NIPFs residing in the Finnish Karelia (North and South) through a mail survey in 2010. The survey questionnaire consisted of close-ended items in three categories: (1) a socio-demographic profile of the Finnish NIPFs (2) background information about their forest estates, utilization and selling of energy wood, and (3) their attitudes to energy wood supply.

Two surveys among the Croatian and Serbian NIPFs took place in 2012, and 232 NIPFs participated (82 from Croatia and 150 from Serbia). The surveys were conducted among NIPFs when they attended private forest owner meetings in their countries. The Croatian participants came from the Zagreb region, and the Serbian NIPFs belonged to the Vojvodina region. The questionnaires distributed among the participants were in Croatian and Serbian languages depending on the place of the survey; however, the questionnaires were similar in content for performing the comparative analysis. The questionnaires consisted of items related to NIPF socio-demographic profiles, including their forest estates, energy wood use, and sales information; using five-point Likert-scale type items (strongly agree to strongly disagree) to explore their attitudes to energy wood supply; and questions related to obstacles to energy wood mobilization from their forest estates. The survey instrument used in Croatia and Serbia was different from that used in Finland, which resulted in certain limitations for comparing the results of the three countries.

3 Results

3.1 Profile of NIPFs

The representation of NIPFs in the surveys was heavily biased towards males, as female participation was on average 10% in the three countries (Table 1). The average age of NIPFs corresponded to the general ageing population structure among NIPFs in the rest of Europe. Most NIPFs in the study appeared to have secondary school level education while university level education was more prevalent among the Finnish NIPFs compared to those in Croatia and Serbia. The majority of the Croatian NIPFs were still employed in either public or private organizations whereas nearly half of the Finnish NIPFs were retired. The average area of forest owned by NIPFs differed greatly between the Finnish NIPFs and the Croatian and Serbian NIPFs. The average area of forests owned by Finnish NIPFs was much higher than for Croatian and Serbian NIPFs. This is because 13% of Finnish NIPFs are reported to own forest estates of more than 100 ha, which increases the average size of their forest holdings.

It appeared that the majority of NIPFs in these countries used wood from their forests for household heating and the average yearly quantity of wood used for such purpose ranged from 12 solid m^3 to 20 solid m^3. Large differences appeared among NIPFs in terms of selling wood for energy production. About 7% of the Croatian NIPFs reported selling energy wood from their forest estates. However, more than half of the Serbian NIPFs and almost one third of the Finnish NIPFs reported that they sold energy wood from their forest estates.

Table 1: Profiles of NIPFs participating in the study

Information about NIPFs		Croatia (N=82)	Serbia (N=150)	Finland (N=79)
Gender	Male	95%	89%	85%
	Female	5%	11%	15%
Average age		55 years	58 years	59 years
Education	Secondary School	77%	93%	64%
	Above secondary school	17%	7%	36%
Occupation	Employee	77%	31%	26%
	Farmer and other Entrepreneur	5%	30%	26%
	Retired	18%	29%	44%
	Other	-	10%	4%
Average area of forest ownership		2.4 ha	6.5 ha	73 ha
Use of wood from own forest for heating household	Yes	79%	95%	83%
	No	21%	5%	17%
Average yearly quantity of wood used for heating household (in solid m^3)		12 m^3	18 m^3	20 m^3
Sale of wood from own forest for energy production	Yes	7%	51%	29%
	No	93%	49%	71%
Average yearly quantity of wood sold for energy production (in solid m^3)		-	28 m^3	200 m^3

3.2 NIPF motivations for supplying energy wood from their forests

Approximately 94% of the Finnish and 83% of the Serbian NIPFs reported that income generation alone was their main motivation for selling energy wood from their forest estates (Figure 1). Approximately 28% of Croatian NIPFs said that income alone would be their main motivation for supplying energy wood whereas 68% reported that both income and environmental benefits would be their main motivation for supplying energy wood from their forest estates. Similar attitudes appeared among 11% of the Serbian NIPFs. Environmental considerations alone appeared as a motivational factor for energy wood supply among 2% of the Croatian NIPFs and 6% of the Serbian and Finnish NIPFs.

3.3 NIPF attitudes towards energy wood supply

NIPF attitudes to energy wood supply were measured and compared in three issues – competition between wood used for energy production and for other purposes; price attractiveness of energy

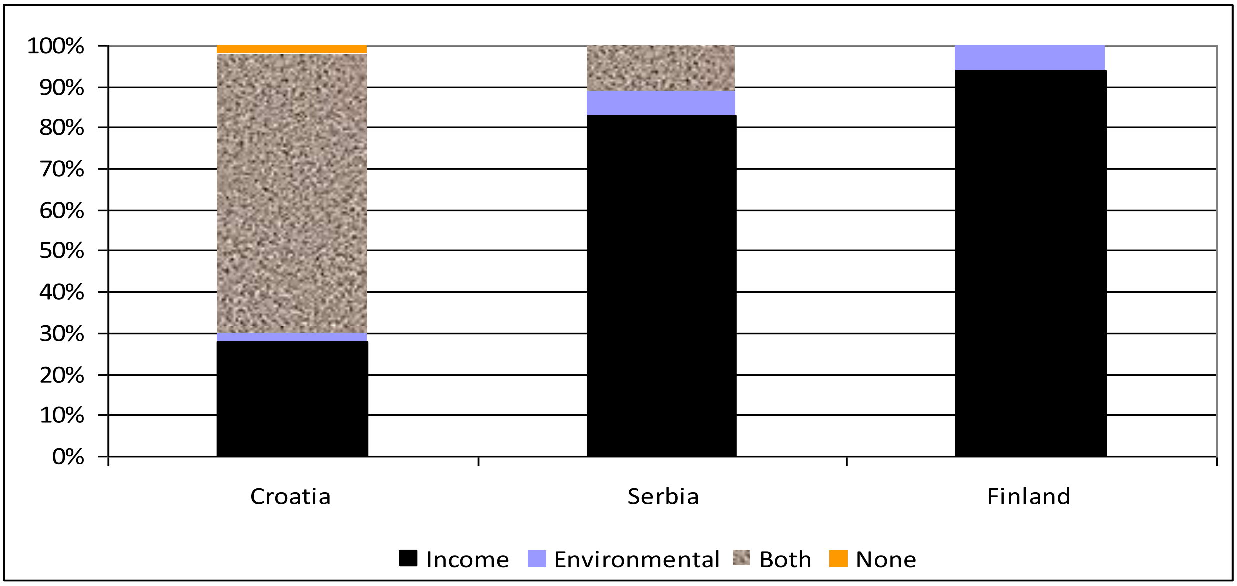

Figure 1: Motivational factors behind supply of energy wood among NIPFs in Croatia (N=82), Serbia (N=150), and Finland (N=79)

Table 2: Attitudes of NIPFs to energy wood supply from their forest estates

Attitudes to energy wood supply	Croatia (%)		Serbia (%)		Finland (%)	
	Agreement (Disagreement)	DKn	Agreement (Disagreement)	DKn	Agreement (Disagreement)	DKn
There is competition between supply of energy wood and wood for other purposes (e.g. timber and pulpwood) in my country	7 (21)	72	23 (69)	8	0 (65)	35
The price of energy wood is more attractive than the price of wood for other purposes (e.g. timber and pulpwood) in my country	9 (25)	67	43 (52)	5	11 (61)	28
I would be interested in energy wood production over pulpwood and valuable timber production if there was a stable energy wood market in my country in the future	95 (3)	2	71(26)	3	6 (74)	20

Notes: Agreement=Strongly Agree *plus* Agree; Disagreement=Strongly Disagree *plus* Disagree; DKn= I do not know; all percentages have been rounded off.

wood; and NIPF interest in supplying energy wood (Table 2). The results showed that the majority of Serbian and Finnish NIPFs, but only one fifth of Croatian NIPFs did not believe that there was competition between the supply of wood for energetic use and for other purposes (e.g. sawn timber, pulp for paper production) in their countries. It appeared that actually none of the Finnish NIPFs considered that there was such competition in Finland while between 7-23% of the Croatian and Serbian NIPFs agreed the existence of such competition in their countries. Similar results appeared on the issue of the attractiveness of energy wood prices compared to the price of timber and pulpwood. The proportion of NIPFs who believed that the price of energy wood was not attractive was much higher than those who believed the opposite. In terms of NIPF interests in energy wood supply from their forest estates, the majority of Finnish NIPFs did not show interest in supplying energy wood from their forest estates. However, the majority of the Croatian and Serbian NIPFs were interested in the supply of energy wood from their forest estates.

3.4 NIPF perceptions of the main obstacles related to the mobilization of energy wood from their forests

More than half the Finnish NIPFs believed that the low price of energy wood was the most important obstacle against mobilizing wood from their forest estates in Finland. Approximately one-third of the Finnish NIPFs perceived logistics, and 2% perceived legal and administrative matters as the other main obstacles to energy wood mobilization from their forest estates. A lack of roads to access their forests for mobilization of energy wood was seen as the main obstacle by 73% of Croatian NIPFs whereas 84% of Serbian NIPFs believed the lack of machinery to harvest energy wood was the most important obstacle in their country (Figure 2).

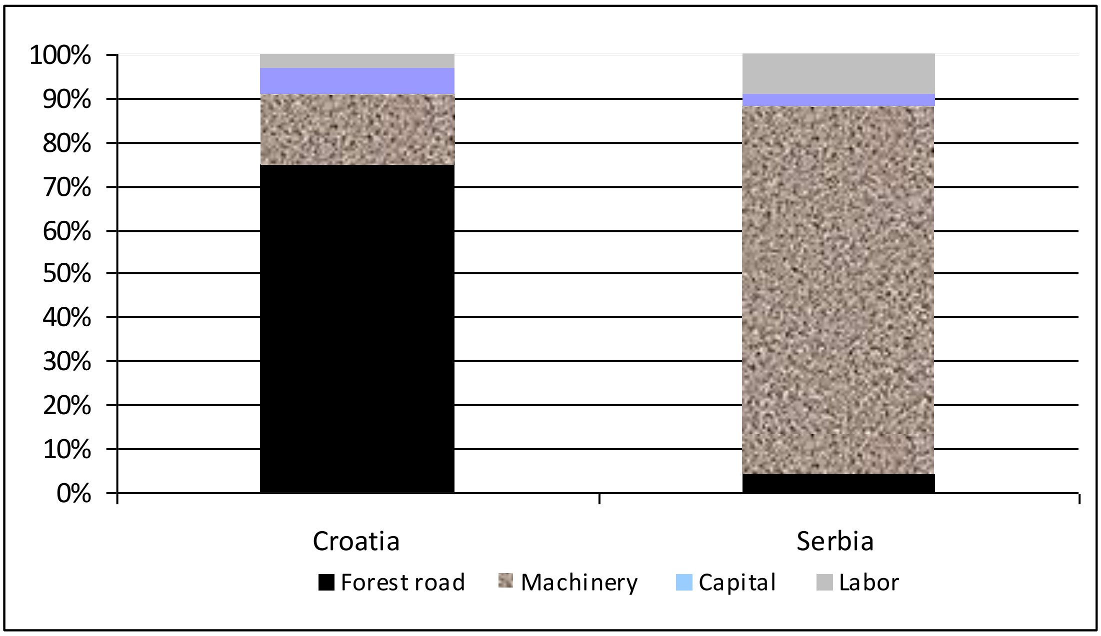

Figure 2: Obstacles to energy wood mobilization from private forests according to the Croatian (N=80) and Serbian (n=150) NIPFs.

Discussion and conclusions

The study analyzed perceptions and attitudes among small-scale private forest owners in Finland, Croatia, and Serbia, related to energy wood supply from their forest estates. The findings about thesocio-demographic profiles of NIPFs along with the size of their forest parcels, own use and selling of energy wood differed among these countries, and corresponded to a previous study where it was reported that NIPFs in Europe were relatively diverse and such diversity also existed at the national level (Wolfslehner et al. 2009). It appeared from the study that NIPFs would be motivated to supply energy wood from their forest estates provided it would be a profitable business opportunity for them. However, the study also revealed that NIPFs did not have positive attitudes towards the current price commanded by energy wood, compared to the price of timber, and pulpwood. Presently, there does not seem to be any competition between the supply of wood for energy production and for other common industrial purposes (e.g. production of timber, pulpwood for paper) in Europe, and the market for energy wood is still emerging. NIPF attitudes about the competitiveness of energy wood therefore seem to be well grounded.

The Finnish NIPFs did not show positive attitudes to supplying more energy wood than pulpwood, even in the context of a stable energy wood market in Finland. The negative attitudes of Finnish NIPFs to energy wood supply could be attributed to their negative perceptions of the price attraction of energy wood and also the logistical challenges such as harvesting and transporting energy wood from their forests to mill gates. However, the results showed that almost one-third of them were involved with the selling of energy wood business, which indicates that even though at present the trade in energy wood is not attractive to most of Finnish NIPFs, it could be an option for some, particularly those owning large forest areas. Forestry operations in Finland are highly mechanized and NIPFs are active suppliers of wood from their forest estates to the forest-based industries in the country. However, NIPFs in this study perhaps believed that the new trend in bioenergy production would depend much on forest residues rather than whole tree harvesting, which could be additional work for them. Another reason may be that Finnish NIPFs are not interested in new activities such as energy wood supply due to their older age, while younger NIPFs are less connected to the forests they own.

The positive attitude of Croatian and Serbian NIPFs to energy wood supply could have emerged due to the perceived income opportunities from such activity, and perhaps they considered it more profitable compared to the current income that they occasionally receive from their forest estates. As private forestry in these two countries is not well organized and less profitable compared to that from public forests, energy wood supply from private forests emerged as a potential source of income for them. This positive attitude among NIPFs towards energy wood supply should be encouraging for the policy makers in these two countries especially as they are planning to increase their bioenergy production in the future. However, as perceived by NIPFs in these countries, there is a need to improve forest roads for better access and transportation of energy wood in these countries and also for the introduction of modern machinery for the efficient harvesting and logistics of energy wood mobilization. These countries can therefore participate in European bioenergy related projects to obtain funds for improving their bioenergy sectors, as well as learning from countries such as Finland, Sweden, and Austria, where forest-based bioenergy production is highly developed.

The findings of the study appear to be relevant for policy makers and bioenergy producers in these countries who wish to understand the social dimensions of energy wood mobilization from private forests. In Finland, the main challenge appears to be motivating NIPFs to participate in energy wood supply from their forest estates, as they did not have positive attitudes about such energy wood supply. However, in Croatia and Serbia, the main challenge will be to improve the pre-conditions for energy wood supply from private forests such as developing forest road networks and the utilization of modern equipment for energy wood harvesting and transportation. In addition to these improvements, there will also be a need to increase the awareness of production and the utilization of energy wood among NIPFs in Europe. The study suffers from some limitations, however, as the questionnaires used were different in Finland compared to the other two countries, so that an item-wise comparison of NIPFs' perceptions and attitudes related to energy wood supply could not be performed. Moreover, the sample size was not large enough to be considered representative of NIPFs in these countries. Future studies should include a larger sample of NIPFs from many other European countries to get a better representation of their perceptions and attitudes to the supply of energy wood from their forest estates.

Acknowledgements

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[CS2-1]

Does Price Matter?

Reconsiderations about Marketing Behaviour and the Success of Small Scale Forest Owners

Christoph Hartebrodt[1] and Sandra Neuwersch[1]

1 Introduction

44% of the forest cover in Germany is privately owned. Thus, private forestry can be seen as one big forest player in Germany. Roughly 60 % of this area belongs to owners who have a forest estate under 20ha. Private forestry concentrates – contrary to communal and State owned forests – mainly on softwood. Recalling that the average stand volume is at a record-breaking level for this property type, the small-scale forest owners have consecutively the potential to serve as a substantial raw-material source for sawmilling industries and other timber consumers. Thus in the recent past, numerous 'timber mobilization campaigns' have been undertaken, however the success was frequently limited, especially with regard to the durableness of higher timber-supply in the case study regions after the end of the individual projects. One point of issue is the role of timber prices as a motivator for timber harvest. On the one hand economic theory tells us, that price is seen as the major influencing factor for producers of all kind of goods. On the other hand there is wide theoretical and empirical evidence that there are different motivational and behavioural sub-groups amongst these small scale forestry owners in which monetary aspects are of various importance.

Abetz (1955) and Tersch (1975) found evidence that the timber price is an influencing factor, resulting in higher harvesting volumes during times of high timber prices. Sekot (1991) underlines that the small-scale owners' focus is more on the coverage of present monetary requirements, frequently resulting from the agricultural part of the mixed farm forest enterprise, than on profit maximization. Brandl et al. (1999) conclude that there is no continuous trend of timber harvest, however higher prices for softwoods normally result in a higher volume harvested. Schreiber (2008) confirms that finding, from an analysis of the results of an annual timber market survey in Bavaria. In a way it is a widespread understanding that owners of small woodlots tend to wait for the best timber prices, which can be seen as a type of gambling.

With regard to behavioural studies, it was shown that timber prices ranked 9 out of ten in Austria (Huber 2007). Hock and Hartebrodt (2013) reveal, that only about 20 % of the owners are interested in selling timber and that in-farm and respectively in house-hold consumption is predominant. Hercher (2012) subsumes results of a survey within the members of the accountancy network of forest owners with an estate of 5 to 200 ha, and finds that the situation on the timber markets is the most important factor. However only 37% of the respondents ranked the timber market situation best and other

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reasons, especially silvicultural needs, were almost ranked equally important (33%).

As a conclusion it seemed to be worthwhile to undertake an in-depth analysis of the long-term marketing behaviour of small scale forestry owners, focusing on the question: Does price matter, in which subgroups and in which way?

2 Material and Method

2.1 Material

In Baden-Württemberg (a federal state of Germany) we have an almost unique data-source for different kinds of economic studies in small-scale forestry (5-200 ha). In the so called accountancy network for mixed farm forest enterprises, there is today an uninterrupted annual time series of (*inter alia*) timber sales and harvesting activities over 30 years, from which 29 years could be used for the research project described below.

As it was aimed to examine the long-term marketing behaviour, we used 104 (out of above 160 enterprises), who deliver their data from the very beginning of the data records. As Norway spruce (including some amounts of silver- and Douglas fir) dominates timber sales, we focused on this particular timber assortment. As there is a strong support from the forest administration for the sale of timber by private forest owners (compare Hock und Hartebrodt; 2013) the average price of individual enterprises is comparatively similar, thus we used the average timber price of the individual year for all enterprises. The harvesting volume to the contrary is in all cases the real harvesting volume of the individual enterprises.

2.2 Method

Recalling that natural disturbances are an unavoidable framework condition, it was partially necessary to divide the fiscal years into two groups. Those which are characterized by more or less regular planned harvesting (‘normal years) and in forest management which is predominantly driven by external reasons for harvest (in our case mainly storm events). A set of key indicators for marketing behaviour was derived, and in most cases we analyzed normal years as a proxy for regular management and the whole time series in order to gain insight into overall marketing behaviour and results. Here we depict the following indicators:

- Own-price elasticity of harvesting volume
- Average timber price in various size classes
- Harvesting intervals in various size classes characterized by the average interval between two felling activities and standard deviation from the average amount of felling volume.
- Average timber prices depending on the continuity of the harvesting activities
- Share of harvesting due to unregulated felling and average timber price

For the analysis of price elasticity, regression analysis (OLS) is seen as an appropriate method. The analysis of the average timber prices related different stratifying characteristics based on arithmetic means. We excluded substrates with less than 6 enterprises to avoid single enterprise effects.

3 Results

3.1 Price Elasticity in various groups and periods

Over the whole period (1982-2011) the price-elasticity is rather low. Enterprises between 5 and 10 ha show an elasticity of 6 % (amount of timber supply increases by 6 % when price rises by 100 %) and respectively 7% in the size class from 10 to 20 ha. In the other two size-classes there is almost no price effect notable (20-50 ha, 1%, < 50 ha, -1%).

Figure 1 shows however, that there is a change over time. In the eighties there was low elasticity in all size classes, with no clear trend, looking at different size classes. Between 1990 and 1999 we observed higher elasticities (10 to 24 %). The smaller enterprises showed a higher elasticity than the two substrata with a larger hectarage. In the last decade the elasticity follows strongly the size classes, but again, to a low level in general.

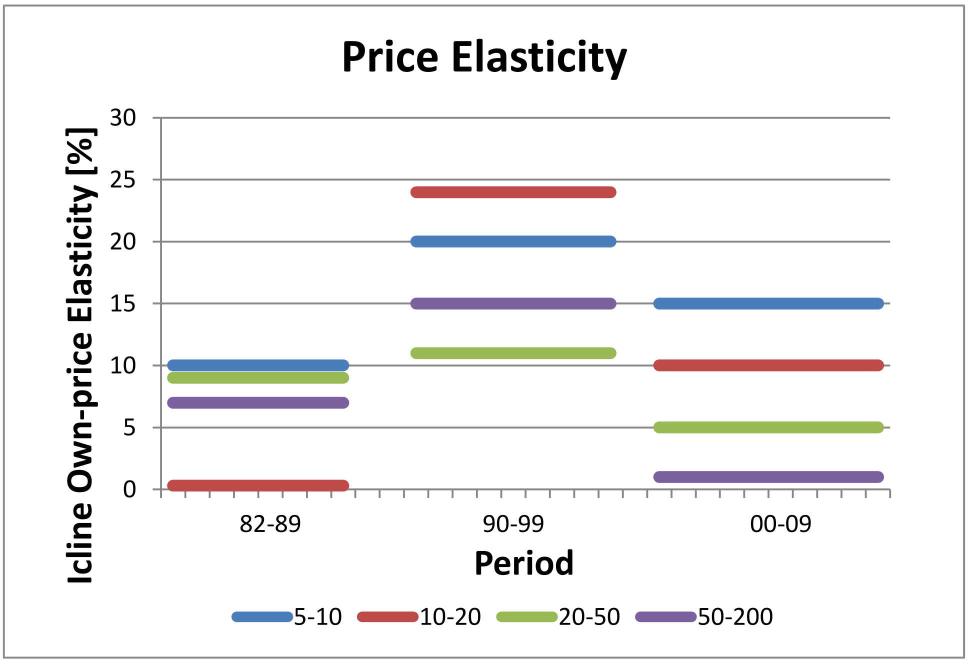
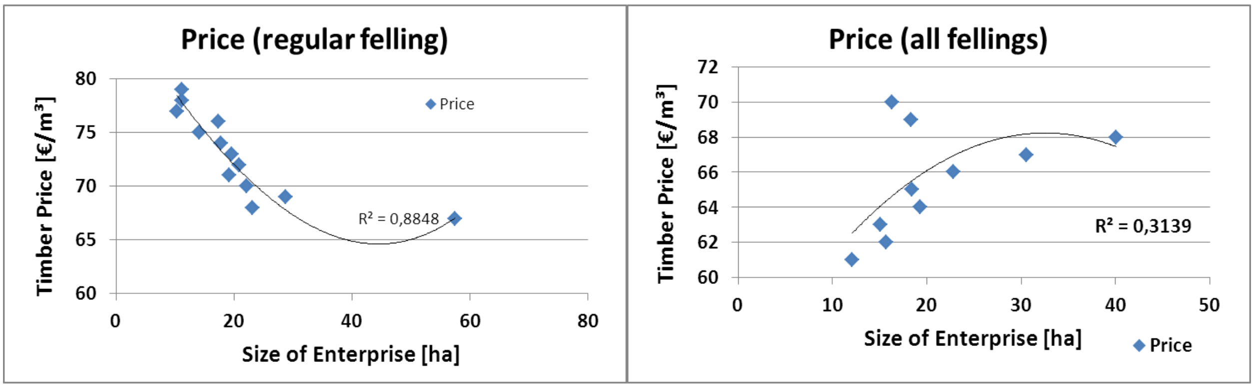


Figure 1: Price elasticities in various size-classes and periods

Source: Own data

3.2 Timber price in different size classes

We analyzed the average size class related to the average timber price the enterprises received in periods with and without the relevant influence of natural disturbances resulting in higher amounts of timber due to unplanned felling. Whereas in times of planned management activities, there is a strong trend that smaller enterprises achieve higher prices (Figure 2a). Looking at the whole period we found evidence that there is a tendency for larger enterprises to gain more money.



Figures 2a and b: Prices in different size classes in years dominated by regular felling and in all years

Source: Own data

3.2 Size of Enterprise and harvesting interval

A widely discussed influencing factor is the ability of smaller enterprises to realize an intermittent management system, which is basically suited to concentrating harvesting activities in years of higher timber prices. In fact, there is a notable trend that the average size of enterprises decreases when looking at strata with longer harvesting intervals. With regard to the standard deviation of the annual harvesting volume, we received equal results with an even stronger coefficient of regression.

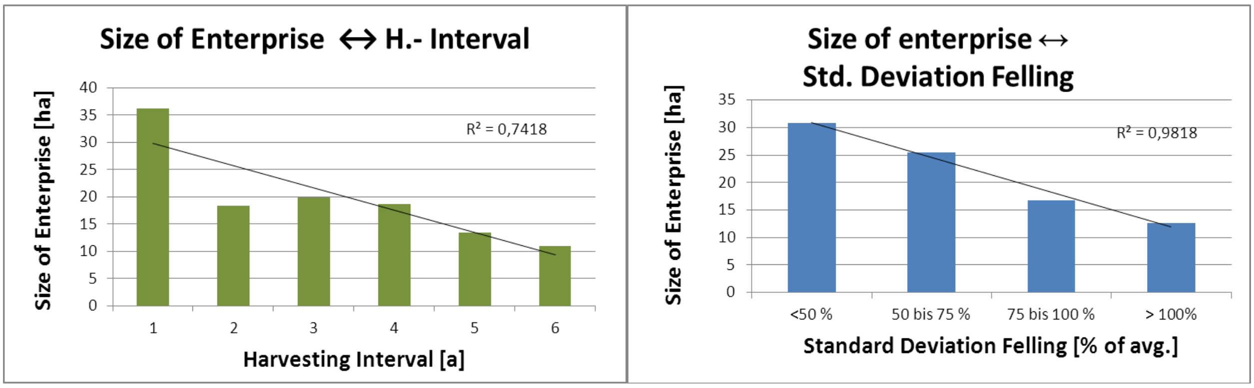


Figure 3 a and b: Harvesting intervals and flexibility in various size classes

Source: Own data

3.1 Flexibility and timber prices

Consequently, it turns out that a flexible harvesting activity can be seen as a means to increase the average timber price in times when planned management is possible. Figure 4 shows that enterprises, which can wait for a favourable timber price by extending their harvesting intervals are able to achieve higher average timber prices.

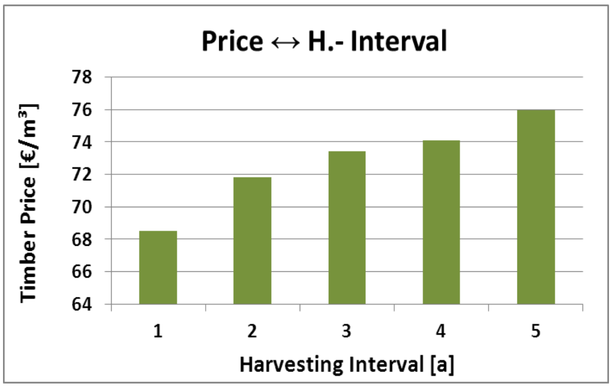


Figure 4: Harvesting interval and average price

Source: Own data

3.2 Share of unplanned felling in various size-classes

The notable difference in prices in times of regular periods compared to all years in conjunction with the important role of different size classes amongst the group of small scale forest owners led to the analysis of the share of unplanned felling in different sub-groups. The underlying hypothesis that smaller enterprises were disadvantaged from a higher share of timber cut in times of unfavourable market conditions after natural disturbances combined with lower timber quality proved successful. Figure 5 provides evidence that the share of unplanned harvested timber in smaller units is close to the four-fold share of unplanned fellings of the enterprises with a hectarage of more than 50 hectares.

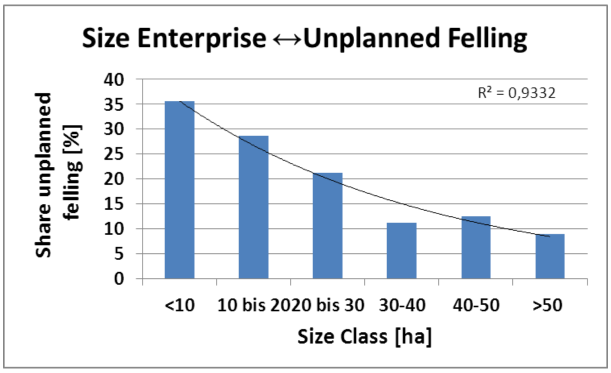


Figure 5: Harvesting interval and average price

Source: Own data

4 Discussion

From a methodological point of view it has to be stated firstly that this kind of economic data has to be interpreted carefully. On the one hand a pure econometric analysis of all the long-term datasets leads to a finding that there is no substantial impact on prices for the harvesting and marketing behaviour of small scale forest owners. On the other hand, the dataset reveals that the forest owners act in different ways and that there are findings which indicate that market prices can have an influence as well. The question has to be raised: how can these findings fit together? A step by step analysis can contribute to that question.

In times which are mainly determined by regular harvest, the average timber price achieved by smaller enterprises is substantially higher. The smaller enterprises are using their flexibility to concentrate their planned harvesting activities during these periods. The larger enterprises are characterized by higher fixed costs and they are forced to harvest continually at least to the level where their individual break-even point is reached. Consequently, they are less able to profit from shifting timber prices and their average timber price is lower. For the final conclusion it has to be kept in mind, that this potential advantage of smaller enterprises does not lead to a higher average timber price, looking at all sales in this 29 year period.

The differences in flexibility, and respectively, continuity can be shown using the key indicators of harvesting interval and the standard deviation of the annual amount of volume harvested. As depicted in Figure 3a and b, the average size of the enterprises is notably higher in enterprises which harvest on an annual bases or realize a more or less stable felling volume each year, which leads to a lower standard deviation of the harvesting volumes over time. A fixed cost structure leads to less flexibility to operate with different harvesting volumes and forces these substrata to harvest more or less independently from topical timber prices. Thus, a reduction in fixed costs can still be seen as a means to make better use of shifting timber prices.

Figure 4 provides evidence that the ability to focus harvesting activities, in years where marketing conditions allow the achievement of above-average timber prices has a relevant impact, as long as periods without a relevant amount of unplanned felling were observed. Enterprises which have been able to practice a five year harvesting interval achieved a net gain of about 10 % compared to the price received by enterprises that are forced to harvest annually. Thus, flexibility has to be seen as a means by which to improve timber proceeds notably.

However, in the long run, and on average, these smaller enterprises took no benefits from the potential chances offered by an intermittent management strategy. As mentioned before, in reality the achieved lower (10 to 20 ha) respectively equal timber prices. A key explanatory factor is the share of timber harvested as a consequence of biotic and/or abiotic disasters. This share increases from below 10 % in continuously managed enterprises over 50 ha, to more than one third, when looking at the smaller units. Two potential explanatory chains appear

1.) In times of lower timber prices, the harvesting activities are not only reduced or stopped, but control and monitoring activities are as well. This allows biotic antagonists to impact the forest to a higher extent. In the case of the predominant tree-species, the bark beetle is known for his high potential to run gradations when not monitored regularly and defeated at an early stage.

2) The stability of coniferous stands depends on thinning activities, especially in younger age classes. A longer thinning (harvesting) interval can lead to a higher disposition to abiotic disturbances like thunderstorms or snow-breakage. In the case of a natural disturbance, higher volumes of non-regularly felled timber occur and reduce the average income from forestry.

5 Conclusion and Outlook

The findings suggest that it is necessary to divide small scale forest owners into two sub-groups. The smallest units (mostly below 20 ha) are basically in the position to profit from an intermittent management that enhances the harvesting intervals and concentrates harvesting activities in times of above average timber prices. However, it has to be kept in mind that this strategy is only successful in the case that the share of unplanned felling remains at a reasonably low level. This indicates that pest management and at least partial risk-reduction by reducing exaggerated timber stock must be intensified in order to realize this possible gain in income. On the one hand, it has to be kept in mind that this strategy, which is beneficial for the owners, leads to unstable timber supply in forest industries and is not the best option from a macroeconomic point of view. On the other hand, it is more than probable that higher timber prices offered by round wood clients will result in higher felling volumes and can be seen as a relevant influencing factor for their timber supply.

Contrary to this, small scale forest owners with more than 20 ha can be seen to have a constant supply of timber in general. The coverage of fix costs, in many cases in combination with the need to draw income form the forest estate, leads to a more even harvesting behavior, less dependent on price signals. This secures the coverage of the basic timber demand, but limits the chance to enhance it substantially by higher timber prices.

From a methodological point of view, it becomes visible that long term data have a large potential insight into marketing behavior. This explorative study should be extended especially with regard to the interaction between the risks of natural disturbances and an optimized marketing strategy. For all enterprises which are able to practice intermittent management it would be of further interest to learn more about price-thresholds, which lead to an optimization of income from timber sales.

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[CS2-2]

Strategy for value creation:

Intermediaries of smallholding teak in Indonesia

Aulia Perdana[1] **and James M. Roshetko**[2]

1 Introduction

Commercially traded smallholder timber, particularly teak, in developing countries have been challenged with the unremitting problem of low returns (Carsan and Holding 2006, Midgley et al 2007, Aoudji et al 2012, Sabastian et al 2012, Rohadi et al 2012). For Indonesian smallholder teak, it is due to low tree quality standards (Roshetko 2012), unfavourable policies (Rohadi et al 2012), lacking accessible market information, weak bargaining power, and high transaction costs (Midgley et al 2007, Perdana et al 2012).

In Indonesia, most teak plantations are on Java, where the largest grower, Perum Perhutani, a state-owned forest enterprise, manages 2,442,101 ha of teak plantation (Perhutani 2010). In addition to Perum Perhutani, there are approximately 1.2 million ha of smallholders' plantations in Indonesia that primarily produce teak (Nawir et al. 2007). Smallholding plantations rarely use improved germplasm or benefit from silvicultural management such as fertilizer application, weeding, thinning and pruning. Smallholders' teak is different from long-rotation industrial plantations that benefit from professional management, smallholders' logs are shorter, have smaller diameter, less clear wood, more knots, and obtain lower prices (Roshetko and Manurung 2009). Despite these shortcomings, smallholding teak plantations are an important source of wood for many teak manufacturers and retailers in Indonesia.

In the process of transfer from producers to consumers, teak pass through a channel involving a series of changes in form and value, and teak traders as intermediaries play an important role in getting products transferred from farm-gates to the consumers. Teak producers' role would basically end after transferring teak trees to intermediaries, who take the responsibilities of harvesting, processing, transporting, storing, promoting, selling, and delivering products (Perdana et al 2012). Meanwhile, farmers have had a tendency to perceive intermediaries as scroungers who take away a significant amount of share of the benefit accrued from the sale of timber by taking advantage of smallholders' unawareness of market prices, weak bargaining power on one hand, and the oligopsonistic nature of the competition on the other (Midgley et al 2007, Perdana et al 2012).

To seek the answer to the question of whether intermediaries are exploiting farmers would require an assessment of the marketing functions performed by marketing actors. In this pursuit, this paper attempts to identify prices of teak in the context of the roles of two primary actors, the farmers

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and farmer-collectors. Finally, by taking into account the roles of intermediaries and their costs of matters directly related to price, this paper examines their strategies as an entity competing for value creation.

2 Research Methods

A research project on smallholder teak agroforestry systems was conducted by CIFOR and ICRAF from 2007 to 2010 with the support of the Australian Centre for International Agricultural Research (ACIAR Project, FST/2005/177). The project site was Gunung Kidul, one of five districts in Yogyakarta Province (Special Region), located in central Java between 7º46'– 8º 09' latitude and 110º 21' – 110º 50' longitude (Figure1). Gunung Kidul was selected as the research site because it has a long history of successful smallholder teak production.

Figure 1: Map of Gunung Kidul district. Gunung Kidul district positioned on a map of Java Island and Indonesia

The research methodology integrated both primary and secondary information to identify smallholder teak actors, marketing practices, and market access. Surveys were carried out in 37 hamlets in Gunung Kidul, a district within Yogyakarta province, Indonesia, representing seven sub-districts, namely Semin, Nglipar, Karangmojo, Paliyan, Semanu, Purwosari, and Tepus (Figure 1). Data collection employed semi-structured questionnaires and was validated with in-depth interviews and focus group discussions.

Information was collected from teak farmers and marketing intermediaries such as farmer-collectors, large-scale traders and local sawmill owners. Information required for the analysis of timber marketing margin were collected using comparison of prices at successive levels of marketing. To identify existing marketing actors involved in the smallholder teak trade, a snowball sampling method was used, which relies on referrals from initial subjects to generate additional subjects. The direction of the snowballing approach was from farmers to processors. The researchers participated directly in the teak timber marketplace and, in part due to their direct participation, were able to describe the value chain. Initially, information was collected from teak farmers who helped to identify the intermediaries whom teak stands were sold to. Then, the identified intermediaries were approached for necessary information collection as well as for identification of other traders who had bought teak from them.

To analyze the smallholder teak market, rapid market appraisal (RMA) was used to identify and assess the problems and opportunities related to the smallholder teak market system, how smallholder teak flows from production to consumption, and to understand how the teak commodity system is organized, operates and performs. RMA is an iterative process and interactive research methodology used to better understand complex market systems in a short time (ILO, 2000; Ostertag et al., 2007; Budidarsono et al., 2009), in-depth interviews and focus group discussions.

Following the identification through the snowball sampling method, the intermediaries were interviewed. They provided information on marketing cost and role in transactions, including method, price negotiations, and payment. In order to analyze marketing margin and income distribution, the intermediaries were asked on buying and selling prices, and marketing costs during the survey of 2010. Because information on marketing was collected from different participants at different points of time, marketing margins analyzed in this study are lagged margins, which were determined by analyzing the difference between the price received by a seller at a particular stage of marketing and the price paid at the preceding stage of marketing. This together with the information provided by farmers facilitated detailed analysis of marketing margin among farmers and marketing intermediaries. Despite being aware of the effect of the quality of wood on its price, it was not possible to examine it because the intermediaries bought teak as standing trees. Further, secondary information regarding smallholder teak log inventory and distribution and harvesting permits was gathered from the local forest and estate crop agency.

Descriptive statistics were employed to summarize the data on smallholder characteristics and teak harvesting using the Statistical Package for the Social Sciences version 16. Triangulation was conducted to verify information on teak value chains and marketing practices for trustworthiness and dependability (Seale, 1999; Mishler, 2000; Stenbacka, 2001) among the samples using in-depth interviews and focus groups (Bashir et al., 2008; Simon, 2011).

3 Results and Discussions

3.1 Characteristics of the households and smallholding teak producers

Smallholder teak plantation is dominating the forest cover in Gunung Kidul. The recent total forest cover in the area has reached more than 42,000 hectares or about 28.5 % of the total district land area (Rohadi et al. 2012). More than 29,000 hectares (69%) of these forests are teak farm forests (BPS Gunung Kidul, 2008). In general, teak is planted on majority land use system practiced by farmers. The types of smallholder teak plantation could be found in the form of (1) kitren, a rain fed smallholder woodlot system where the main objective is teak production; (2) tegalan, a rain fed farming system that produces both teak and agriculture crops; (3) pekarangan or home garden; and (4) as border planting on paddy fields.

Based on the surveyed area, an average of only 10% of farmers' land is allocated to teak production. Similarly, the economic contribution of teak sales to total household income averaged 11.6% (between 2007 and 2008). Teak farmers in Gunung Kidul considered teak plantations as their financial reserve of last resort, maintained until all other disposable assets (motorcycles, electronic devices, jewellery, and livestock) had been sold. For some of Indonesian ethnic groups, especially the Javanese people, teak has become an important part of their culture and is considered more desirable than other wood species or agricultural crop in the country (Muhtaman et al, 2006). Roughly 80% of the respondents harvested their teak when faced with significant financial needs, such as weddings, school fees, medical expenses or social/cultural commitments. Only 14% of respondents harvested trees based on economic maturity.

3.2 Marketing channel and role of market functionaries

Farmers, intermediaries such as farmer-collectors and large-scale traders, and processors are the major functionaries in the smallholder teak marketing system in the study area. Intermediaries sell teak supplied from the study area to large-scale wood processors and furniture manufacturers in cities where advanced wood processing facilities are located, such as Yogyakarta and Jepara, in Central Java. Some enterprising farmers, with relatively high income and some knowledge about trading activities who have been referred to as farmer-collectors in this study, buys teak from farmers and supply it to the large-scale traders based in cities.

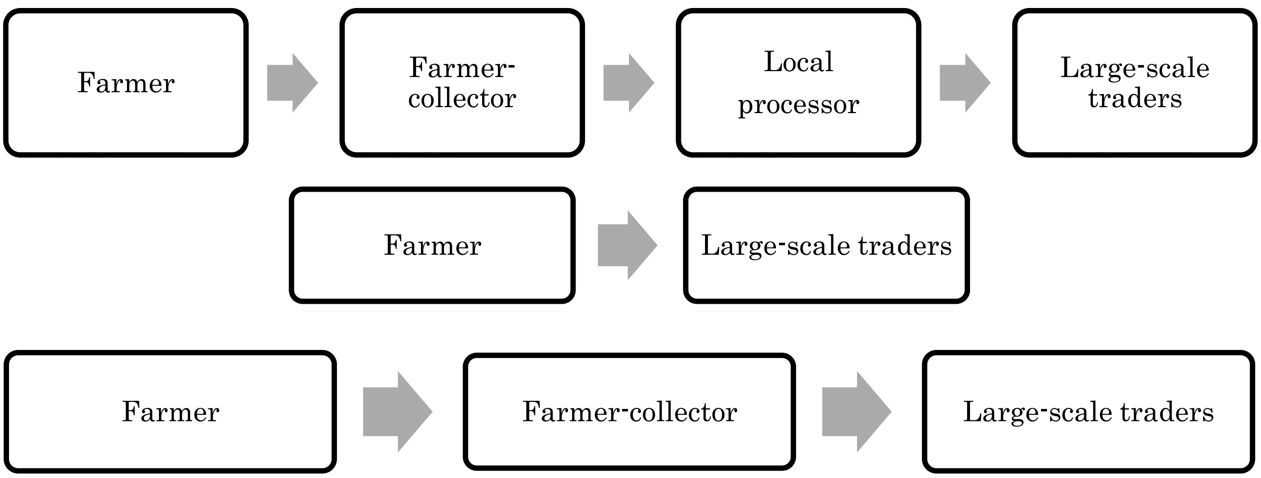

Figure 2: Smallholder teak chain actors in three product flows

3.3 Farmers' marketing practices

Farmers' role is limited to producer and would end after transferring teak trees to intermediaries. They would basically sell what is produced instead of producing what sells. Generally, farmers do not engage in timber processing or conversion activities. Farmers engage in the marketing chain through collectors or large-scale traders, but generally have limited access to market information and were not in a position to negotiate higher rates (Carsan and Holding 2006, Holding and Roshetko 2003, Tukan et al. 2006). Standing trees are the standard unit of sale for farm-grown teak. Negotiation with collectors was done without clear quality or value standards. To obtain a better price, farmers collect information from other farmers who have recently sold trees. To improve their bargaining position, farmers would also offer the same trees to two or more collectors. Regardless of the negotiation approach taken, farmers usually obtain prices that are well below market rates because of their limited access to market information and weak bargaining position.

Perdana et al. (2012) observed that smallholding teak producers compete with a well established, state-owned forest enterprise. Meanwhile, access to markets, market knowledge, financial resources, and tree production and management, all of which bore on product quality, were identified as barriers to entry by smallholders into the teak market. With bargaining power at the supply level, farmers deal with the overwhelming profit-eroding power of buyers, the intermediaries. Improving market information for smallholders, simplifying timber trade regulations to minimize transaction costs, and developing links between teak producers and teak industries are among the recommendations to initiate effective marketing strategies for smallholders growing teak.

3.4 Farmer-collectors' marketing practices

As intermediary, farmer-collectors played an important role. First, they searched the marketplace. Guided by their information network, they visited teak growers and explored upstream for product supply. They had to repeat this search process frequently because supply, quality, and prices changed often. Second, farmer-collectors performed various sorting functions by accumulating the harvests of

Table 1: Activities and costs in the teak market chain

Activities Involved	Cost Represented
Physical possession	Storage and delivery costs
Ownership	Inventory carrying costs
Promotion	Personal selling
Negotiation	Survey time and legal costs
Financing	Terms and conditions of purchase and sale
Risking	Price guarantees, repairs and possible loss, and illegal charging
Payment	Collections, bad debt costs

multiple teak producers into homogenous lots for sale to the manufacturers. Third, traders served to minimize and facilitate the number of contacts in the channel system.

In practice, farmer-collectors visited the farm to measure, assess and negotiate the price for individual trees or blocks. All collectors would measure the tree diameter at an over-the-head level, and not at the normal diameter at breast height. Given that collectors buying from smallholders had to deal with numerous farmers producing teak of variable quality and quantity, and take the responsibilities of harvesting, cutting, sorting, transporting, storing, promoting, and selling, transaction costs were high, leading to lower prices for farmers. Table 1 shows the costs of post-harvest responsibilities.

Farmer-collectors are practically competing with other collectors, mostly from the neighbouring village. Relationship with farmers is a matter of mutual trust built upon business relationship over several years or based on kinship. Collectors have access to market information such as current price, demand, and specifications. From their informants, collectors are aware of prices offered by other collectors. Farmer-collectors' role ends when logs or sawn timber are delivered to the buyer, large-scale traders or manufacturers.

3.5 Role of local processors and large-scale traders

Sawmills provide wood processing services for collectors. Sawmills in the study area process teak logs, which take more than 60% of the total wood processed. Each have a daily average capacity of six cubic meters with a maximum capacity of 15 cubic meters and charge an amount of about US$13 per cubic meter. All sawmills needs permit from the forest and estate crops agency to operate and process logs to various dimensions for various functions, such as plain planks and boards in various thickness, battens, rafters, and joists for roofing construction, windows and door frames.

Large-scale traders have well established personal contacts with farmer-collectors, retailers and other distribution agents as they have been engaged in business relationships with them for several years. They usually are based in cities and buys logs and sawn timber from farmer-collectors and local sawmills. Similar to the relationship between farmers and collectors, relationship with larger traders is a matter of mutual trust built upon a gradually established business relationship. Large-scale traders act as buyer from farmer-collector and conduct negotiations with large manufacturers mostly in the furniture industry.

3.6 Marketing margin

With regards to the flow of teak timber in market channels, intermediaries managed various interactions—physical possession, ownership, promotion, negotiation, financing, risking, and payment—each carrying costs of its own. From the intermediaries' point of view, each interaction represented sunken costs, costs that may not be recovered because the price was negotiated and agreed prior to the harvest. A significant amount of risk was embedded from the beginning of the negotiation process. The profit and marketing margin of farmers and collectors are shown in Table 2.

Table 2: Price changes for smallholders' teak in Gunung Kidul

Age (year)	DBH (cm)	Price accepted by farmers (USD/standing tree)	Log volume after processing by collectors (m^3)	Log price collected by collectors (USD)	Profit margin received by collectors (USD)	Marketing margin (%)
10	12–18	3–6	0.045–0.189	3–25	0-19	0-76
15	13–31	5–30	0.060–0.515	6–123	1-93	16,7-75,6
20	21–45	10–265	0.307–1.061	57–284	19-47	6,7-82,5
25	29–49	20–296	0.320–1.321	54–329	33-34	10-62,9

As mentioned earlier, farmer-collectors visited the farm to measure, assess and negotiate the price for individual trees or blocks. For obvious reasons, collectors would prefer to buy a block of trees to press costs. As an illustration, collectors would spend the following amount, shown in Table 3, for a block of 15 year-old 20-30 trees. Besieged by the amount of money they will receive, farmers would easily sell their trees.

Table 3: Harvesting cost components by block of trees

Harvesting cost component	Unit	Cost/unit (USD)	Cost (USD)
Village permit	1	2.22	2.22
Labour for tree felling	1	3.33	3.33
Labour for carrying logs from farm to the nearest road	3	3.33	10.00
Chainsaw rental	1	22.22	22.22
Gasoline for chainsaw	5	0.72	3.61
Carpenter	1	3.33	3.33
Meals	5	1.67	8.33
Transport from village to logyard	1	11.11	11.11

This aspect of the buying and selling process incurred risks for both teak farmer and intermediaries. With harvesting costs averaging US$27.26 per tree (US$81.93 per m3) but varying greatly, farmer-collectors sometimes made a net loss owing to unforeseen or arbitrary costs: a distance of one kilometre from the nearest road could increase harvesting costs up to 20%, undetected tree defects reduced the quality of teak wood, decreasing profit by up to half, transaction costs for obtaining timber transport documents from the village and local government authorities could equal 10% of the total cost. An efficient channel is critical to any current or potential industry participant concerned about the availability and cost of current and future supply of smallholders' teak.

3.7 Intermediaries' strategies

Most market participants are both buyers and sellers in a market. Therefore, it is important to understand how to minimize pressure on profits that can be exerted through bargaining power. Suppliers with bargaining power can extract excess profit by charging higher prices, limiting quality or services, or shifting costs to industry participants and hence obtain more of the value for themselves (Porter 2008).

Similarly, buyers with bargaining power can extract excess profit by putting downward pressure on prices, demanding better quality products or services, and play industry participants off against one another, all at the expense of industry profitability (Porter 2008). To be able to obtain bargaining power at the supply level, intermediaries should focus on the uniqueness and relative scarcity of the product and consider value-added approaches. By taking these steps, intermediaries can retain more profit through value-added manufacture, and control more of the value chain.

Cost leadership strategy, i.e. having the lowest prices in the target market segment, can also be applied to intermediaries of smallholding teak, although it needs to be structured down to fit with smallholder conditions. This strategy involves a business entity winning market share by appealing to cost-conscious or price-sensitive customers. This is achieved by having, at least, the lowest price to the price compared to what customers receive. To succeed at offering the lowest price while still achieving profitability and a high return on investment, the entity must be able to operate at a lower cost than its rivals (Porter, 1980).

The first approach is achieving a high asset turnover. This approach means fixed costs are spread over a larger number of units of the product or service, resulting in a lower unit cost, i.e. the intermediaries hopes to take advantage of economies of scale and experience curve effects. Higher levels of output both require and result in high market share, and create an entry barrier to potential competitors, who may be unable to achieve the scale necessary to match the low costs and prices.

The second approach is achieving low direct and indirect operating costs. This is achieved by offering high volumes of standardized products, offering basic no-frills products and limiting customization and personalization of service. Production costs are kept low by using fewer components, using standard components, and limiting the number of models produced to ensure larger production runs. Overheads are kept low by paying minimal wages and locating premises in low rent areas. Maintaining this strategy requires a continuous search for cost reductions in all aspects of the business. This will include outsourcing, controlling production costs, increasing asset capacity utilization, and minimizing other costs including distribution.

The third approach is control over the supply chain to ensure low costs. This could be achieved by bulk buying to enjoy quantity discounts, squeezing suppliers on price, instituting competitive bidding for contracts, working with vendors to keep inventories low using methods such as Just-in-Time purchasing. Other procurement advantages could come from preferential access to raw materials, or backward integration. This strategy may have the disadvantage of lower customer loyalty, as price-sensitive customers will switch once a lower-priced substitute is available. Nevertheless, ideas on the profit impact of marketing strategy that indicate entities with a high market share are often quite profitable, but so are many others with low market share, needs to be explored further.

4 Conclusion

The findings of the study lead to a number of conclusions, that farmer-collectors play a significant role to the value chain and addresses the needs to reduce transaction costs in order to be 'fair' to farmers. Several recommendations to initiate effective strategy for farmers and farmer-collectors were identified. The first would be to improve market information system that can be accessed by farmers and collectors. Regular market information on teak prices and qualities could be provided through local mass media, such as radio and local newspaper.

Second, through government's involvement, is to simplify timber trade regulations to minimize transaction costs, making the smallholding teak market more efficient, for example, by including smallholder teak into the certificate of origin scheme or to promote the exclusion of smallholder teak from the obligations of the certificate of legal logs and certificate of legal forest product to the government. Simpler procedures for timber distribution would provide incentives to smallholders to invest in teak plantations and in turn will benefit farmer-collectors by providing them better quality logs.

Third is the application of the cost leadership strategy for intermediaries to gain sustainable competitive advantage. By achieving high asset turnover, low direct and indirect operating costs, and control over the supply chain to ensure low cost, intermediaries would, in turn, provide chance to win the competition and at the same time perform 'fairplay' to their suppliers, the smallholder farmers.

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[CS2-3]

The Solomon Islands Dilemma: Market Access in a Fragmented Landscape

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1 Introduction

Unsustainable logging has been a feature of Solomon Island life for many years and has been one of the main sources of foreign income in a country that is ranked 143rd in the world with a GDP per capita of US$1,517 which may be compared with Australia which is ranked 9th with a per capita GDP of US$61,789 (Index Mundi, 2013). The imminent collapse of the logging industry will certainly see this problem worsen as logging currently accounts for 60-70% of the countries income. However, Solomon Islands has the near perfect combination of climate and soils that makes it the ideal situation for growing high value timber and the potential income generation from timber is enormous. Yet the nascent community timber growing industry that has been developing over the past 10-15 years is struggling to survive with growers rapidly becoming disillusioned with the nearly insurmountable problems they apparently face. This paper will examine the development of that industry, the problems that it faces and some of the potential solutions to those problems.

1.1 Teak

The decline in natural forest derived teak has kept the prices high. India has placed a moratorium on the harvesting of teak from natural forests and it is generally accepted that the harvest in Myanmar is unsustainable and will halt altogether in a few years. This has resulted in an explosion of plantation teak in countries such as India, Laos, Indonesia and Thailand, these plantations as in Solomon Islands, are often small community or individual woodlots. Plantation teak is held in lower regard than 'natural' teak though this distinction will become far less important once the supply on natural teak tightens. Testing of Solomon Island teak has shown that it is as good as any plantation teak currently available (QDEEDI, 2012) with the advantage that it will grow to harvestable size within 20-25 years, compared to 50 – 70 years in Thailand. This is a real market advantage, allowing 2 rotations for every 1 in Thailand.

1.2 The Development of Community Forestry

It is widely recognised that an isolated incident where a single grower managed to sell some teak and mahogany sparked what is known as Teak Fever in Solomon Islands around 16 years ago (Hughes

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et al., 2010). This sudden interest in timber growing was supported by the SIG Ministry of Forestry and was recognised as a potential source of foreign currency as well as being a sustainable and technologically appropriate way for the rural population to develop. Solomon Islands population is over 80% rural with little opportunity to make more than a subsistence living from agriculture. Various cash crops have flourished and then declined on the whim of market forces. Copra, coffee and cocoa are still grown but the income is uncertain. Timber especially teak, is seen as a far more stable and valuable commodity.

1.3 Solomon Islands and Market Access

Solomon Islands is an archipelago of nearly 1,000 islands that vary in size from small coral atolls to large volcanic ranges (Figure 1). The 80% of the population that lives outside urban areas are scattered throughout the country, mainly on the larger volcanic islands. There are less than 600 kms of roads in the entire country (C.I.A., 2013) meaning that boats are the primary form of travel for everywhere outside Guadalcanal, the main island. Transport services are reasonable to the larger population centres and non-existent elsewhere meaning that people and goods have to get to the transport nodes. The most prolific form of transport is the wooden canoe, carved from a single trunk of the *Gmelina moluccana.* Those who can afford it have larger boats with an outboard motor, either wooden, fibreglass or aluminium which are often used for inter-island trips. It is this lack of suitable transport for timber that provides the biggest barrier to market access for the vast majority of Solomon Island growers. Transportation limitation has also meant that the majority of timber buyers have concentrated in Honiara the major city and port which has road access to the islands interior and easy access to the container terminal. There is another port in Western Province at Noro, which is the centre of the Solomon Island tuna fishing and export industry but the facilities are limited.

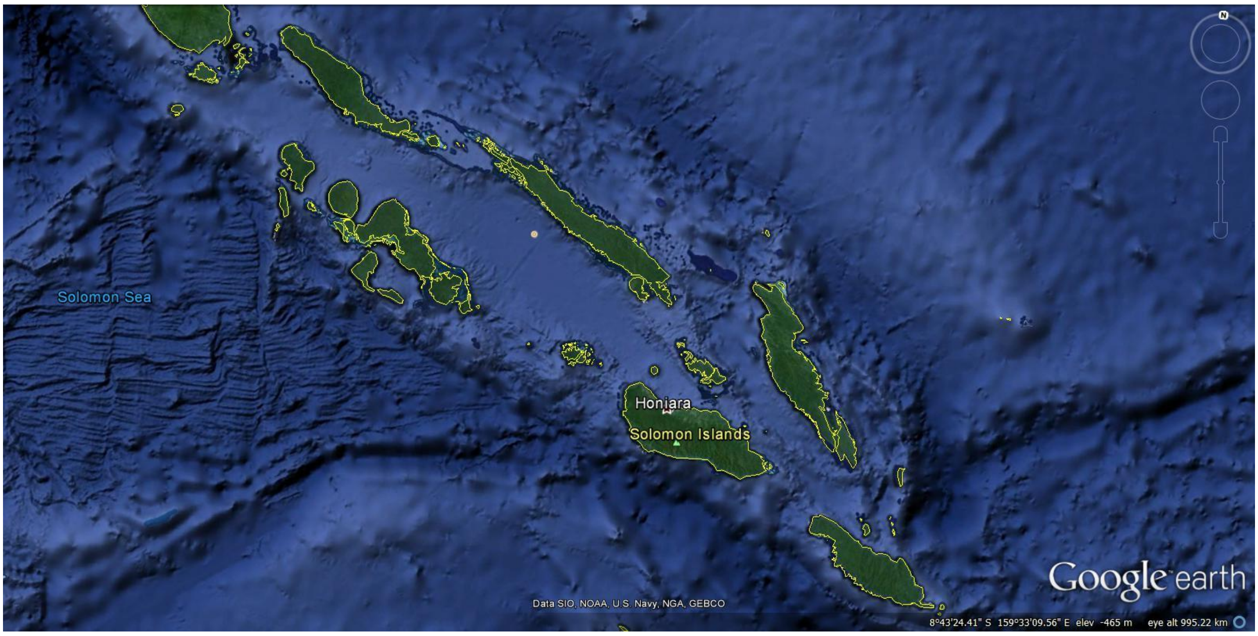

Figure 1: Solomon Islands

1.4 Current Situation for Community Growers in Solomon Island

Many of the plantings are now over 10 years old and are in desperate need of proper maintenance, including thinning. Most growers are aware that trees need to be thinned but are reluctant to do so without some return on their investment. The idea of 'thinning to waste' or pre-commercial thinning, is abhorrent and there is no culture of using teak within the village. The possibility of even undertaking a commercial thin is remote for most growers as there is no access to a market and it is this simple fact that underpins the difficulties that nearly all growers in Solomon Islands face. As a result of this situation there are thousands of hectares of stagnating plantations in Solomon Islands and planting of new woodlots has slowed down to a trickle. There is no incentive for new plantings and growers are getting increasingly disillusioned with timber growing as a means for supporting their families. This is a tragic situation in light of the imminent collapse of the native forest industry and the consequent loss of the foreign currency earning capacity of the country (Asian Development Bank, 2013). Native forest logging currently accounts for around 70% of Solomon Islands GDP and community forestry has the potential to make up some of the shortfall whilst providing a valuable income earning opportunity for rural families.

2 Discussion

Community forestry is an obvious target for Aid agencies as it works in rural situations with some of the poorest people in the country. In areas where the population density is quite low, there is sufficient land to set aside for plantation style forestry. It is reasonably cheap to set up and has potentially good outcomes for the growers. There is a long history of development agencies working to establish community forestry programmes and in many countries, trees are often a living bank account which can be drawn upon in times of crisis or when medical bills and school fees are required. However, this outcome is dependent upon the right infrastructure being in place. In places like India, Laos, Indonesia and Thailand, the facilities exist for the exploitation of the resource with a multitude of local level manufacturers who provide a readily accessible market for the trees. In Solomon Islands this situation does not exist and is the major cause of the problems facing growers.

The advent of community forestry in Solomon Islands was reasonably spontaneous as word spread through the bush telegraph of the profits that could be made from selling Teak. However, this was soon taken up by the Ministry of Forestry and then by the AusAID funded Forest Management Project (SIFMP) which actively encouraged the planting of small, community woodlots. AusAID had 2 phases of SIFMP and it is only fair to acknowledge that these programmes were operating under extremely difficult conditions due to the civil unrest and its aftermath that has dominated much of Solomon Islands life. But there is also no doubt that these programmes and those of other aid agencies operating in Solomon Islands have had a goal of encouraging the development of a community forest industry. SIFMPii had a stated goal of 1,000ha of plantation to be established annually bu smallholder growers, with the emphasis on small area plantings ((Raymond and Wooff, 2006)There is a commonly held belief among foresters that once a significant and valuable resource is developed, the infrastructure to exploit that resource will follow. While this has proven to be the case in countries such as Australia and New Zealand with the established infrastructure needed to exploit the matured resource, it has not worked in Solomon Islands. Using data gathered during SIFMP II, it is clear to see that the woodlots that have been developed are small in size, averaging 0.25-1.00 hectare and owned by over 9,000 individuals or communities (SIFMP, 2006). The fragmented nature of this resource mitigates against the development of the infrastructure needed to harvest and even the possibility of interesting logging companies to invest in harvesting a <1ha plot is extremely remote. The finish of Phase II of the SIFMP saw the effective end of AusAID's involvement in the community forestry sector. Despite the fact that the Solomon Islands Rural Livelihood Program Design document (a paper on the future of AusAID in Solomon Islands) identified smallholder forestry as one of the 4 areas of significant interventions, this has not happened. Personal communication with AusAID in Honiara has specifically ruled out any activity within the forestry sector. This has effectively abandoned community growers to their fate with moribund plantations and no support.

2.1 Potential Solutions

Since 2008 the Australian Centre for International Agricultural Research (ACIAR) has been working with community growers in Solomon Islands to overcome some of the problems associated with growing trees in a remote location. To overcome the problems of thinning teak to the final stocking rate, project FST/2007/020 "Improving silvicultural and economic outcomes for community timber plantations in the Solomon Islands by interplanting with *Flueggea flexuosa* and other Pacific agroforestry species" developed a mixed species agroforestry system whereby the Teak was planted at the final stocking rate and interplanted with a local species to bring the plantation to the normal 4m x 3m spacing (Blumfield *et al.*, 2013). The local tree was harvested for use by the owners, effectively thinning the plantation without the need to remove any teak. While this has resolved the problem of selling thinnings, it still does not overcome the barriers to the sale of the final harvest.

A further project under the ACIAR umbrella, managed through the Pacific Agribusiness Research for Development Initiative (PARDI) has been designed to try and overcome market access problems in the Western Province of Solomon Islands. This project (2011.06 - Development of a market mechanism for Teak and other high value timber in the Western Province of the Solomon Islands) is looking for a way for growers to get their thinnings to a market. Originally conceived to try and develop infrastructure such as a barging service, the arrival of milling operation at the local port has altered the dynamic as there is now a local outlet for thinnings, if the sawmill agrees to take them. However, even with this welcome development growers still face significant problems such as how to get thinned timber from plantation to a loading area and how to then get the timber to the sawmill as there are no roads. For larger areas of plantation, it is possible that the sawmill will send a barge and undertake the entire felling, snigging and loading operation themselves, but this will significantly impact on the price they will pay growers and will not be available to smaller woodlots.

Promoting the local use of the non-commercial timber is also seen as a way for growers to gain additional value from their plantations. The PARDI project is working with local carvers and furniture makers to promote the use of non-commercial teak within the communities.

One solution to the problem of transport is to reduce the logs to a manageable size in order that they can be manhandled to a loading facility. But this requires tools and skilled operators. It is possible to roughly dimension timber using a chainsaw, but this procedure results in variables sizes and reduced prices. There is also the problem of availability, many growers do not have access to even the most basic tools, often resulting in poor silviculture.

Lack of the most basic tools is one of the commonest reasons given for the poor quality of silvicultural management in plantations in Solomon Islands. A possible solution would be the establishment of local tool banks. A tool Bank would address this issue in 2 ways. The first would be to supply, at low cost, some of the basic tools of forest management such as pruning saws. The second would be a certified tool loan scheme that would provide more expensive equipment such as chain saws and chain saw mills, under strict conditions, to growers who are registered participants in the scheme. This would allow growers the opportunity to value add by sawing timber into accurately dimensioned square sections that will also allow for easier transport to the loading area. This will increase the economic returns to the growers and make them less vulnerable to manipulations by buyers. It would seem to be a good vehicle for the intervention of one of the development agencies such as AusAID and is well within their capacity to implement. AusAID in particular still have forestry as one of their priority areas, under Priority outcome two: improved economic livelihoods the stated objective is: “To support more productive and sustainable utilisation of agricultural land, forests and marine resources, and the improved operation of markets for the benefit of rural households towards the MDG (Millenium Development Goals) targets of 2015.” Yet Forestry has been systematically ignored with the efforts under this programme going toward agriculture and horticulture.

There also seems to be an unwillingness to attack the very real problems of transport and infrastructure. In a country made up of 1,000 islands but with less than 400 km of public road the most essential piece of infrastructure is the ability to transport goods by sea at a price that is competitive and with a service that is reliable. Development agencies such as World Bank are happy to fund the construction, maintenance and repair of roads which benefit less than 20% of the population, yet no one seems to be prepared to invest in a reliable sea transportation service. This would have a huge impact on the ability of all rural sectors such as agriculture and forestry to get their goods to markets and would enable rural communities to participate in the national economy in a meaningful way.

It may be that the significant problems faced by smallholder growers will mean that this style of high value timber production will not be viable for the foreseeable future. But this does not mean that timber growing will not or cannot provide for a sustainable, rural industry that will benefit rural communities. The economies of scale would suggest that the only viable option is for individuals to work together as communities, sharing the work but also sharing the profits. There are already examples of this approach working in Solomon Islands. The most significant of these is the community of the Christian Fellowship Church, a religion based in around 20 villages in the Roviana and Vonavona lagoons, which has a joint plantation estate that will run into several hundred hectares. The central control of this estate gives the growers far greater leverage when dealing with potential buyers and the size of the estate makes it economically viable for harvesting operations and barge collection to take place. There is a similar ethos at work in Saika village in Vonavona lagoon where the community has planted over 20 ha of mainly teak trees. With plantations of this size, gaining FSC accreditation becomes feasible thereby adding greater value to the final harvest. However, the legacy of the corrupt practices of the logging companies that have operated throughout Solomon Islands is a breakdown of trust within many village communities. Overcoming this will be the greatest barrier to effective community action.

2.2 Lessons for the Future

If there is a lesson to be learned from the plight of Solomon Island growers it must be that short term development thinking must be avoided. While forestry is an obvious route for rural development it cannot be promoted without a clear analysis of the entire market chain nor without a commitment to see the process through to a logical conclusion. Solomon Island growers feel they have been abandoned and lay the blame on the Forestry Department but in reality the FD was acting as agents for the AusAID funded SIFMP and it is AusAID who must shoulder the responsibility. AusAID no longer supports any activity within the Forestry sector, despite their own programme priorities, yet with a long term crop such as trees they have not even seen the product through to the first harvest.

Many villages have areas of logged forest that have become overgrown with weeds and non-productive. One village group described the logged forest as a 'waste land' no longer providing the benefits to the village that has traditionally been the forests primary function. Forests have been the traditional source not only of timber for construction but of many non-timber forest products, food, fibre and medicine. Logged areas have naturally become the target for the establishment of plantations of teak and mahogany, but given all the problems outlines above, a new approach is required. As part of ACIAR project FST/2012/043 "Enhancing economic opportunities offered by community and smallholder forestry in the Solomon Islands", we are promoting the re-establishment of native forest through agroforestry, not for commercial timber but for all the traditional values that the forest used to contain. Agroforestry is simply the vehicle to control the weeds and re-establish trees through enrichment planting. The real goal is to give value back to areas laid waste by logging, especially for regions where the possibility of gaining access to markets for timber is remote.

3 Conclusion

There is a future for forestry in Solomon Islands, the continuing success of the two commercial operations in Western Province and the community action by the CFC villages and Saika village are pointers to the future direction. There are also several sustainable community-based native forest logging operations supported through development agencies scattered throughout the country. However, individual smallholder forestry is only viable where the infrastructure exists to support it and the thousands of smallholders with existing woodlots will continue to face the dilemma of market access in a fragmented landscape.

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[CS3-1]

Revitalizing Mountainous Villages by Empowering Women (Part I)

- A Case Study of Direct Marketing of Forestry Products (Edible Wild Plants) from Noto Peninsula to Kanazawa City, Japan-

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Abstract

Rebuilding and revitalizing the rural society and rural economy which are continuously declining due to the fast modernization and globalization have been the focus of recent administrative efforts in Japan. A "regional multi-industrial system" initiative for creating new high value-added business is being studied, using the case of directly transporting specific local products to the urban market. Recently, four Japanese Agricultural Cooperatives (JA) of Okunoto in Ishikawa Prefecture incepted a project that local forestry products featuring diverse species produced at a small amount are collected and directly transported to market at Kanazawa City. This project encourages local residents to commercialize their surplus forestry products, cultivated or wild, such as pickled or dried wild plants. Knowledgeable elderly people, in particular, women are motivated to direct market their home made wild plants to local restaurants and hotels. This case study was observed to discuss new possibilities of sustainable rural development and sustainable use of traditional knowledge and local forestry resources in a global context. A combination of qualitative and quantitative method will be employed. Some research questions included: What are the social and economic impacts of this initiative on local communities? Can small agribusiness Initiatives collaborated with JA bring economic or social sustainability to the remote rural region?

Key words: ageing population, the remote region, farmers' wellbeing, rural regeneration, woman empowerment

1 Introduction

After the rapid urbanization in Japan since 1960s, many young people moved away from their home town. Rebuilding and revitalizing the rural society and rural economy which are continuously declining due to the fast modernization and globalization have been the focus of recent administrative efforts in Japan. Population loss is particularly serious in the remote and disadvantaged regions in Japan. In this research, a case study of small agri-business is used to explore a multi industrial small

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business model for the potential rural development strategy in the remote region.

Accordingly, this study has several research questions as below:

What are the social and economic impacts of this initiative on local communities?

Can small agribusiness Initiatives collaborated with Japanese Agricultural Cooperative (JA) bring economic or social sustainability to the remote rural region?

What are the challenges perceived by the different stakeholders?

What administrative support is needed at the local level?

2 Study site and method

The hilly Noto Peninsula (Figure 1), also usually called the Noto region, is situated in the north of Ishikawa Prefecture, which juts out into the Sea of Japan. As a narrow long peninsula extending from the south to the north, the area is characterized by a configuration of closely knit together *satoyama* and *satoumi* (Japanese socio-ecological production landscapes and seascapes), with their associated land uses, diversified livelihoods based on agriculture, forestry and fisheries, lifestyles and customs, and biodiversity.

A combination of qualitative and quantitative data collection methods was employed in this study. In depth interviews were conducted with multiple stakeholders: producers of small farmers,

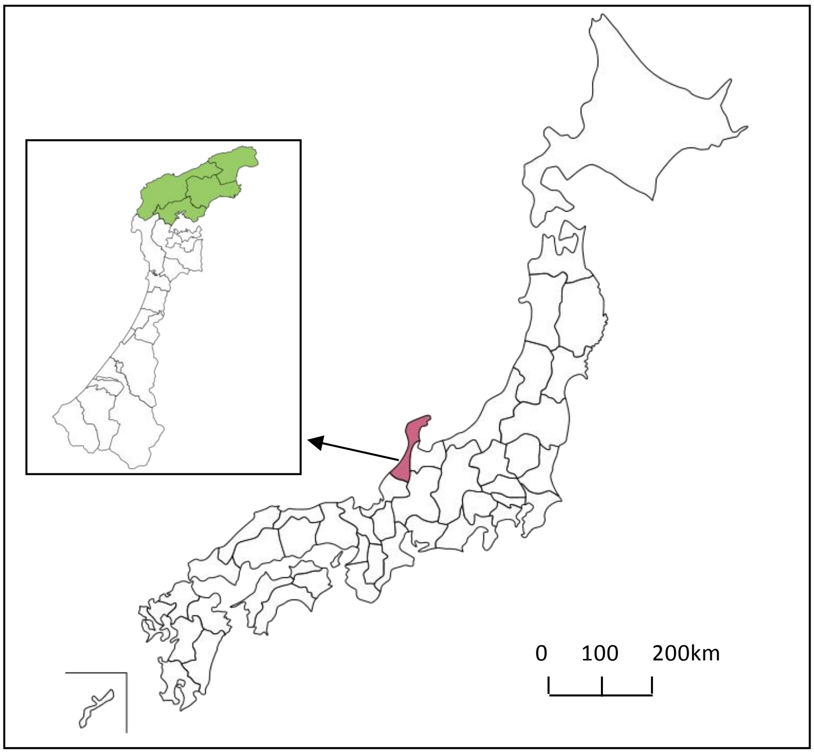

Figure 1: Map of Okunoto in Ishikawa Prefecture

Note: Okunoto, literally meaning the remote Noto, consists of Suzu City, Wajima City, Noto Town and Anamizu Town.

people who are engaged in marketing process, such as JA staff, the wholesaler, and the brokers, and government officials relevant to technical or administrative support. Interviews lasted around 90 minutes to 120 minutes on average. A semi-structure questionnaire sheet was designed, and revised after a group meeting with three producers and JA staff in June 2013. Then, the questionnaire survey was conducted among the farmers who participated in the Producer Anniversary Meeting in July, 2013.

The questionnaire is comprised of three different sections. The first section includes questions regarding their attitudes toward this small business. Respondents were asked to comment on their perceptions related to their financial, social, psychological, technical and healthy aspects. Five-point Likert's scale ranging from "strongly agree (=5), agree (=4), neither agree nor disagree (=3), disagree (=2), highly disagree (=1)" was used to collect information about the respondents' opinions. Several open questions were used to collect extensive opinions regarding the benefits of this business. The last section includes questions regarding the socio-demographic information of the farmers such as age, education, income, gender. Data were analyzed using SPSS (Statistical Package for the Social Sciences) version 16.0.

3 Multi-industrial small agribusiness in Okunoto

A recent multi-industrial small business of directly transporting farm products and non timber forest products, such as mushroom and wild plants, which are collected from small farmers in Okunoto to Kanazawa, the capital city of Ishikawa Prefecture (Figure 2). The direct transport of farm products and forestry products from the remote areas to the city consumers was incepted in 2009. The growers or harvesters themselves pack the products and even process the fresh vegetables at home. Every day, two trucks transport fresh local vegetables from four JA groups of Suzu, Machino, Uchiura and Anamizu to the central market of Kanazawa City. Most of these Noto specific vegetables are distributed and sold in Kanazawa City, while, a small portion is later shipped to Tokyo through vegetable whole sale corporations. The registered producers for direct transport project totaled over 300 (see table 1), among whom around 137 persons were active members that sold their products in 2012. The total sales accounted for around JPY 28 million in 2012. The total sale almost tripled that at the beginning year of 2009. Five producers sold more than JPY one million of vegetables, among whom the highest sales totaled JPY 2 million.

Another newly incepted parallel imitative of processed Edible Wild Plants (*sansai* in Japanese and *sansai* will be used below as the abbreviation of "edible wild plants") Initiative, which uses the same transport routes, started in the winter of 2012. Noto is endowed with rich diversity of *sansai*, however, *sansai* had never been sold to Kanazawa and usually used for self consumption. In contrast, people from the neighboring prefectures of Fukui and Toyama Prefectures come to Noto for *sansai* harvesting. At first, many locals held skepticism toward the market value of fresh and salted *sansai*. Several popular species of fresh edible wild plants were sold to Kanazawa City early to more than 20 years ago through this direct transport line from Okunoto to Kanazawa. However, the harvest period of edible wild plant is very concentrated and in a short time. And, the price of edible plants drops considerably after the weather becomes warm after the long holidays at the beginning of May. Thus, the knowledgeable elderly women were organized into a few groups based on their geographical residence and to sell their home made processed edible wild plants since 2012. Each group consists of around 3 to 4 persons who are in charge by a selected leader.

Table 1: Fast growth of direct transport project

Year	Sale amount (JPY)	Production amount ((kg)	Producer number	number of product varieties
2009	10,305,373	29,835.9	208	269
2010	16,292,613	44,250.1	234	239
2011	26,559,499	89,681.1	281	237
2012	28,369,858	97,703.6	300	233

Source: JA Ohzora

About 17 elderly and very knowledgeable women, most of whom were at their 60s and 70s, were selected to sell their home made pickled *sansai* to the JA group in Okunoto. JA group has talked to the locals who have been selling agricultural products to JA Farmers' Market. A former Zen-Noh staff, named Yoneda, instructed the locals to reduce the salt use in preserving *sansai* for the healthy purpose. Theses knowledgeable women harvested *sansai* and pickle *sansai* at their own house and sell them to JA stores in the cities in the winter before the Spring Festival.

The amount of salted *sansai* was still very small and sold out in one month. The next step plan is to increase the production quantity to meet the market needs. Therefore, JA group has been organizing workshops to attract the potential producers and educate the locals in regard to thorough hygienic management and knowhow of vegetable salting.

JA groups support the local women with the salting process in a unified way to secure the stable quality of processed wild plants. In 2012, the salted wild plants were sold from the end of December to January with a target of providing foodstuff for the New Year's cooking recipes. Two elderly women producers were invited to sell in front of the customers to share their experience of edible wild plant harvest, processing and even cooking methods. It turned out that commercialization of salted edible plants is a big success that the consumers, in particular those who were brought up in Noto and now are living in Kanazawa City commended that the taste of traditional salted plants took them back to their childhood period in the rural villages of Noto.

Because of the good sale record in 2012, pre-order demand tripled in 2013. Thus, the JA groups requested their producers of these elderly women to increase their production amount. In line with the strong market demand for local specific vegetables, a big scale popular hot-spring hotel in Noto City, the center of Noto Peninsula, is negotiating with the Okunoto JA groups to provide the guests with processed edible wild plants as breakfast. JA groups consider it a big business chance, although, they take a cautious attitude to it because it is vital to secure both the quantity and quality in order to gain trust for their new trial commodities.

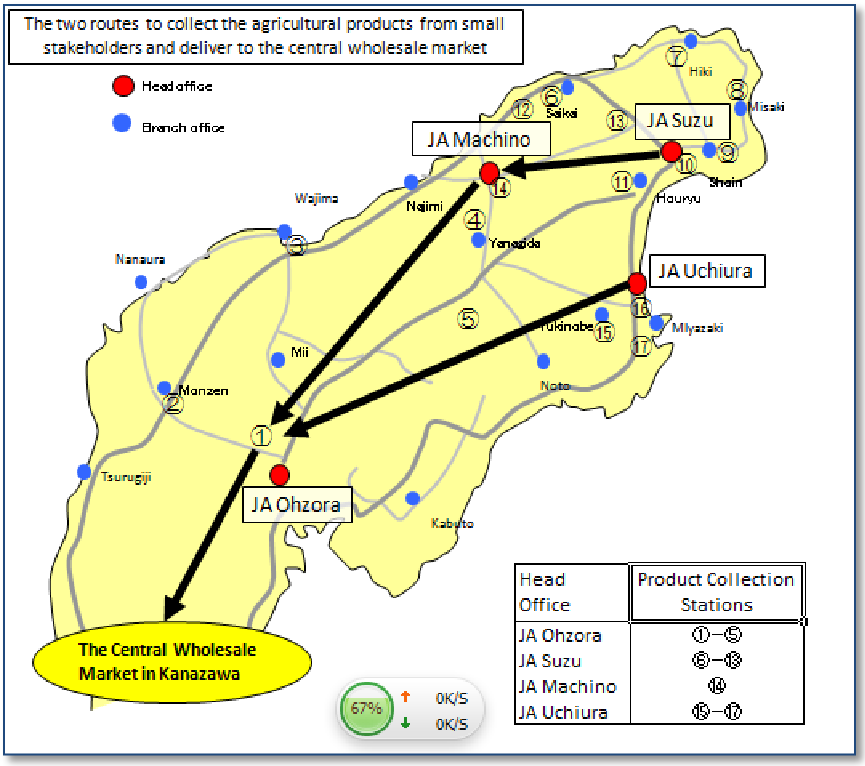

Figure 2: Two shipping routes of collecting farm and forestry products from Okunoto to the central wholesale market

Source: Ishikawa Prefecture

4 Results

4.1 Management and marketing strategies to enable small farmers' participation

The project has turned the farm product surplus to a new source of income regeneration. The paddy field area accounted for about 84 of the total cultivated farmland in Ishikawa Prefecture (MAFF 2011). Thus, rice is the major crop, while, vegetables have been growth for self-consumption in Noto Peninsula due to the small scale land located in the mountainous and hilly region, as well as its distance from the city market. The broker said that he did not see any farm products from Noto Peninsula that before. The farmers interviewed also that they had to dispose the vegetable surplus that before, but not they can sell the surplus for income regeneration.

Figure 3 shows as a flow chart of farm and forestry product shipping, marketing and information feedback. The producers are learning relevant skills to enhance sale price, such as shifting from common species to some rare species, greatly improving their packaging skills.

The vegetable price was fed back to the producers every day. The connecting with the market and outside greatly motivates the farmers to produce good quality vegetables, which can be sold at high price in the market and enables farming adapt their cultivation strategy. At the beginning of this project, farmers produced some common vegetables such as Japanese radish, onion and cabbage. However, they found that they could not compete with other big scale vegetable farmers. In order to compete effectively outside the other large scale whole market channel, these farmers shifted their operation strategy to produce some minor varieties, in particular, colorful vegetables. They take the advantage of small plots of land at the mountainous and hilly area and diversify cultivation varieties for the niche market.

The sale price was reported and sent to them at around 2:00pm after the close of whole sale market. An informant said:

> "I am very excited to see the price and compare my price with my fellow farmers. I am doing researching regarding the causes to price difference."

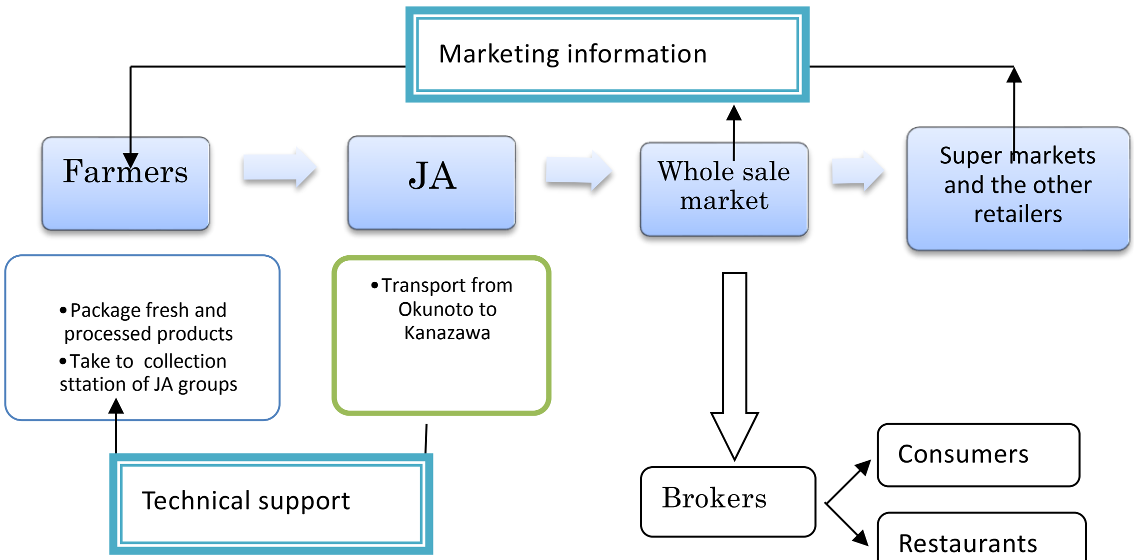

Figure 3: Schematic diagram of farm and forestry product shipping, marketing and information feedback

Photo 1: Producers were attending a study tour to the central wholesale market

Photo 2: The producers exchange production and marketing information in the central wholesale market. The photo shows an elderly was doing research on the vegetable variety.

Workshops relevant to production technology, packing skills, and food safety are organized and held regularly to educate the farmers. And some farmers perceived the get-together as precious opportunities network building and information exchange. Onsite visit to the whole sale market was organized once a year. The photos 1 and 2 shows the farmers were scrutinizing the products and the package exhibited on the floor waiting for the brokers to determine the price.

4.2 Socio-economic impacts of the small business

We collected a total number of 32 questionnaire sheet. Table 2 shows the demographic characteristics of small participant farmers, with 40% of males and 53% of females. Age distribution in table 2 shows that over 90% participants were above 60 years old. In other word, the majority of the active players of this project are retirees.

Several participants considered this small business as lifetime career before their death. An informant (female, 74 yrs. old) grew pumpkin for 1 ha with her husband in the past and now is shifting to this project. She said:

> "My husband is already 80 yrs old, thus, we are not able to continue pumpkin growing anymore. I had been seeking for something that I can manage by myself. And my friend introduced this project to me."

Table 2: Profile of the respondents

	Gender			Age				
	Male	Female	No response	40-49	50-59	60-69	70-79	80-
Frequency	13	17	2	1	2	9	17	3
%	40.6	53.1	6.2	3.1	6.2	28.1	53.1	9.4

An important aspect of this survey is to investigate participants' attitudes toward this small agricultural business operation. As shown in Table 3, participants generally ranked top three aspects of economic return (3.7), the safety of products (4.0), and farm work as healthy activities (3.7). Food safety and product quality has been considered by JA and the prefectural office as among the major barriers of small farmers' engagement with markets. And the farmers also highly recognize its importance.

Another informant (female, 50s) said that "she is planting at a small quantity and will increase products after retirement when she can concentrate on farming."

4.3 Challenges

The problems and challenges of this project were summarized based on the interview results with key informants from Ishikawa Prefecture and JA staff. The major factors concerned by these stakeholders including the age of producer and the quality and quantity of products.

Table 3: Summary of general attitude toward small agricultural business (percentages are in parentheses; N=32)

	Very important		Somewhat important		Neither agree nor disagree		Somewhat Unimportant		No response		Mean ranking
Income generation	20	(62.5)	7	(21.9)	3	(9.4)			2	(6.3)	**3.7**
Fun of crop growing	16	(50.0)	9	(28.1)	1	(3.1)	2	(6.3)	4	(12.5)	3.2
Information exchange with friends	12	(37.5)	7	(21.9)	7	(21.9)	2	(6.3)	4	(12.5)	3.2
Technical support from JA	12	(37.5)	10	(31.3)	6	(18.8)	1	(3.1)	3	(9.4)	2.8
Self-determination of farm operation and management	15	(46.9)	8	(25.0)	3	(9.4)	1	(3.1)	5	(15.6)	3.3
Know of various vegetables	11	(34.4)	7	(21.9)	5	(15.6)			9	(28.1)	3.1
Importance of formwork for health	18	(56.3)	6	(18.8)	3	(9.4)	1	(3.1)	4	(12.5)	**3.7**
Importance of product taste	18	(56.3)	8	(25.0)					6	(18.8)	3.5
Importance of product appearance	17	(53.1)	10	(31.3)					5	(15.6)	3.2
Importance of product safety	21	(65.6)	8	(25.0)					5	(15.6)	**4.0**
Importance of preventing land from abandonment	16	(50.0)	12	(37.5)	1	3.1	1	3.1	2	6.3	2.9

(1) Most of the participants are in their 60s or 70s, it is vital to attract younger people to participate this direct transport project.

(2) Among the total over 300 registered farmers, there were only around 19 persons whose sales reached or over JPY 0.5 million. It is important to secure the annual sales of producers higher than JPY 0.5 million, which was considered as the minimum amount of sales for a profitable business of vegetable selling.

(3) Since the production and harvest time of vegetables and edible wild plants are concentrated. Thus, the JA group is instructing the producer to endeavor to sell more than JPY 0.3 million at a certain period in order to secure a certain amount of revenue.

(4) Nowadays, majority of edible plants were harvested from the mountain forest or its surroundings. Thus, it is very difficult to inform the wholesale dealers when, what, and how much could be provided for the whole sale market.

(5) It is urgent to enhance the quality of vegetables produced by small producers at a small quantity.

Some solutions proposed by JA include strengthening technical support of edible wild plant cultivation to provide with a stable supply to the market and request farmer to submit their production and sale plan at the beginning of each year.

5 Discussions

5.1 Empowering the small farmers, elderly farmers and females

One of significant lessons from this project is fully utilizing the elderly people and empowering the small farmers, in particular females in the remote region.

At the same time, the farmers have made farm operation and cultivation decisions independently. Autonomous management and outside support from the urban are considered two major factors for agricultural business success in the rural (Onishi 2012). Traditionally, ageing and old age has been described as a "problem" (Powell and Biggs 2000). This case study in Japan reveals the old people's participation in productive activities is enhancing the rural viability. Our finding is consistent to the research in developed countries in Europe noting that older people should be seen a potential resource in rural communities instead of sole recipients of care (Walsh and O'Shea, 2008).

The same as the experience in other countries, women have been playing a more and more important role in rural (Janvry and Sadoulet 2002) development. Our case study in Noto Peninus suggests that women can be actively engaged with labor intensive cultivation of vegetable growing and value added production of fresh vegetable processing. It is argued that women's entrepreneurship contributes not only the linkage of income increase but also human capital asset accumulation (Uemura 2012).

5.2 Interaction with the market

An active interaction of individual farmers with the market and access to market information not only enhance their sale price, but also greatly motivate the participation of small farmers. This direct marketing model has small farmers highly exposed to the market. Thus, the farmers have to adapt their operation strategy in order to take advantage of the market price. The revenue highly depends on farmers' judgment of market demand and farming endeavors. As the other side of coin, small farmers are also highly motivated since their individual effort is directly linked to the market price. The ability to adjust to changes and the willingness to respond to market demands is an important aspect of rural development strategy (Terluin 2003).

5.3 Technical assistance from JA and agricultural technology extension of the prefectural office

It is worth noting that technical support from JA and the prefectural office is also indispensable factor of production and sale growth in Noto. However, some farmers stated that they are accessed to the internet for growing technologies. The dependence of technological assistance from the cooperatives and administrative organizations also help to enhance the reciprocal trust with local farmers. And the trust is considered as an important factor for rural development. Rural communities that are strongly connected in the form of trust, reciprocity and exchanges and social network, are assumed to have a high capacity to respond to disturbances (Murphy 2007).

6 Brief policy implication

This case in Noto Peninsula suggests a new small business model of making the advantages of local resource allotment consisting of an ageing population, women's knowledge, a very small scale farm land plots. Although, the prevalent understanding of "rural development" has been equated to a larger scale production with a smaller number of labor power, it was argued to be ill-suited to the establishment of new innovation networks (Murdoch 2000).

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[CS3-2]

An Analysis of Factors that Contribute to Sustainable Agroforestry

: A Case Study of Korea (the Forestry Products Production Complex scheme)

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1 Introduction

The forest land covers 65% of the nation's total land area in Korea. However, we can't expect much economic benefits from the forest land because most of the forests are still in the stage of silviculture and are not economically feasible considering its difficult access with severe slopes. It raises harvest cost of lumber and prevents dynamic economic activities using forest. Nevertheless, in order to keep up with sustainable forest management and accomplish balanced regional development, we need to overcome the obstacles and find a way to encourage sustainable economic activities in the forest.

To make it worse, the barriers that prevent forestry development in Korea are not restricted in them. Most of the forest farmers are small side-job farmers without forest land. Most of the private forest land, which is located near mountain villages and relatively easy to access, is owned by landlords who are living in city areas. They are not interested in managing forest and reluctant to lease the land, which results in poor forest management. Rural areas are experiencing a serious aging problem such that most of them have already passed the aging society and are now near the super aging society.

To encourage sustainable forest management as well as to keep up with the growing demand for clean forest products, Korea Forest Service has been supporting forest farmers to make large scale farms for producing forest products since 2008. It is called the Forestry Products Production Complex scheme. Being provided the 60% of the budget by central and local government, forest farmers can make land arrangement or build necessary facilities such as sprinklers, wells, and greenhouses. Using sloped forest as well as less sloped forest, farmers can grow various forest products including mushrooms, persimmons, wild greens, medicinal plants, wood-cultivated ginseng, fruit trees such as jujube and even scenic trees.

As a result of the scheme, we expect several positive direct and indirect outcomes. The income of participating farmers can increase, and residents or forest farmers living nearby can also generate income by being hired. We expect the spill-over effect of providing a good example for attracting more forest farmers to start Forestry Products Production Complex with or even without government

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support. Proper forest management would increase the benefit of preserving the forest ecosystem and the environmental value of forest. It can contribute to revitalizing mountain villages as there are more business activities.

2 Current condition of forestry product industry

2.1 Forest farmers and income

There are 96,108 forest farmer households in Korea. Among them, only 2.4% is working at lumber production and the rest works at forest products cultivation.

The proportion of side-job farmers was already high in 2005 at 82% and then worsened to 90.9% in 2010. The proportion of forest farmers of more than 60 years old was 37.6% in 2005 and 50.9% in 2010. During the same period, the proportion of relatively young forest farmers of less than 40 years old has decreased from 6.7% to 1.5%.

The level of forestry income per forest farm household was only 8 million won (7,200US$) in 2011, and the total income per forest farm household was lower than agriculture or fishery.

Table 1: Trend in forestry income per household

Unit: US$, %

	2005	2007	2009	2011
Forestry Income	5,935	8,174	6,958	7,323
Forestry revenue	11,904	14,877	14,416	15,116
Forestry cost	5,969	6,701	7,427	7,794
Income ratio	49.9	54.9	48.3	48.4

Source: Forestry Economic Survey (Korea Forest Service, 2011)

Table 2: Comparison of total income per household among forestry, agriculture and fishery

Unit: US$, %

	2005	2007	2009	2011
Forestry household(A)	24,680	25,910	24,900	25,883
Agriculture household(B)	27,730	29,060	28,013	27,407
Fishery household(C)	25,480	27,880	30,859	35,112
A/B	89.0	89.2	88.9	94.4
A/C	96.9	92.9	80.7	73.7

Source: Forestry Economic Survey (Korea Forest Service, 2011)

2.2 Production of forestry products

The size of forest land in Korea is reduced from 6.45 million ha in 1995 to 6.37 million ha in 2010.

It still covers 63.7% of land. In 2010, forest land consisted of 45.5% of conifer, 27% of broadleaf, and 29.3% of mixed forest. During the last 10 years, the size of conifer forest has increased and broadleaf forest has decreased.

In terms of ownership, more than 60% of forest land is owned by private individuals or groups. The size of private forest is 4.34 million ha and covers 68% of forest land in Korea. National forest, on the other hand, covers 24% (1.54 million ha) and public forest is 8% (0.49 million ha).

Table 3: Forest land by tree types

Unit: thousand ha

	Total	Conifer	Broadleaf	Mixed	Unstocked
1995	6,452	2,877	1,668	1,718	188
2000	6,422	2,711	1,666	1,891	154
2006	6,389	2,695	1,660	1,876	158
2008	6,375	2,680	1,659	1,860	175
2010	6,369	2,581	1,719	1,872	197

Source: Forest Statistics Yearbook (Korea Forest Service, 2011)

Total volume of forestry production in Korea was 2,934 billion won (2.67 billion US$) in 2010, whereas in 2001, it was 1,968 billion won (1.79 billion US$). Major forestry products are landscaping trees, nuts, medicinal plants, shiitake mushrooms and wild greens. In 2011, 81,847 thousand landscaping trees were produced and its economic volume was 711 billion won (645 million US$). The volume of nut production, which includes chestnut, walnut, and pine nut, is 258 billion won (235 million US$). The production of medicinal plants has increased as the market for health functional products expanded. The sales volume of medicinal plants has increased from 524 billion won in 2005 to 913 billion won (830 million US$) in 2010. And the volume of shiitake mushroom and wild greens in 2010 was 215 billion won and 500 billion won respectively.

3 Development of Forestry Products Production Complex scheme

3.1 Overview of Forestry Products Production Complex (FPPC) scheme

The purpose of the scheme is to build a stable forestry product production system while adhering to the sustainable agroforesty principle. In that sense, we expect good forest management practices as well as increase in forestry income.

In order to become a beneficiary of the scheme, forest farmers need to submit a forest management plan satisfying the lower-bound forest size limit. The lower bound is set considering a minimum income generation that can cover the cost of farm management. It is 25,000m^2 for herb plants, wild greens, and nuts. For shiitake mushroom, it is 3,300m^2, and for landscaping plants, it is 1,650m^2.

The upper limit of business size is 500 million won (0.45 million US$) which is financed by national, local, and own money. Using the money, forest farmers or relevant business entities can make various preparations for sustainable forestry product production. Allowed preparations vary according to cultivated plants but land preparation, access road, operation road, and planting are included in common. In addition to them, fences, watering systems, or greenhouses can be built for herbal plants or mushrooms.

The government plans to construct 150 Forestry Products Production Complexes by the end of 2019, and it has been helping to build 15 complexes a year on average.

Starting with 11 Forestry Products Production Complexes (FPPCs) constructed in 2008, there are now 99 FPPCs nationwide in mountainous areas. Among them, the majority of products are wild greens (32 FPPCs), wild ginseng (18 FPPCs), and mushrooms (20 FPPCs). In terms of location and type, there are 37 FPPCs that have greenhouses or growing facilities, and the rest is for open-field culture. There are 57 FPPCs located in forests, and 5 FPPCs are located in flat lands. Typically, the FPPCs in flat land are more integrated than farms in forest in terms of land arrangement and cultivation, hence we expect better financial outcome.

3.2 Progress of Forestry Products Production Complex scheme

In terms of product type, wild greens, shiitake mushroom and wood-cultivated ginseng are the majority of them.

In terms of location, we classify the complex into three types. They are forest land complex, flat land complex (both for open-field culture), and greenhouse complex. In the case of forest land complex, farmers cultivate products extensively in the forest land which has slopes and is not easily accessible. In the case of the complex in flat land which has fewer slopes than forest land, farmers usually do the land preparation before planting and cultivate more intensively than in the forest land. Greenhouse is the most intensive complex among the three, and mushrooms or some wild greens are usually cultivated in greenhouses which are built on a much smaller size of land than others.

Among the complexes surveyed, 36 of them have the experience of cultivating similar products before while 28 others don't.

Table 4: The complex by commodity

	Total	mushroom	nuts	jujube	Ginseng[1)]	greens	herb	landscaping	others
total	99	20	2	8	18	32	7	5	8

1) Wood-cultivated ginseng

Table 5: The complex by types

	total	mushroom	nuts	jujube	Ginseng[1)]	greens	herb	landscaping	others
Greenhouse	29	20				5		3	1
Flatland	13			8		1	1	1	2
Forest	57		2		18	24	11		2

1) Wood-cultivated ginseng

In terms of complex size, the complexes vary from 392m^2 of mushroom greenhouses to 450ha of open field with wild greens (bracken). When the complex size is compared with the lower bound set by the government, there are 14 complexes that are more than 9 times larger, 9 complexes that are 6-9 times larger, 13 complexes that are 3-6 times larger, and 24 complexes that are less than 3 times larger.

As for the managers' will for success judged based on the interview, we considered many components, such as their knowledge about the scheme, completeness of business plan, attitude for the interview, and the frequency of visits to the complex site. And we conclude that 50% of them have a high will for success and the rest have a low will for success.

We asked them what makes it difficult for them to manage the complex, and they said money-related matters such as raising additional operating cost and low discretion to use the government-backed fund are the most difficult problems they face.

Table 6: Difficulties in managing the complex

Unit: %

Difficulty	Rate
Raising additional operating cost	21
Low discretion to use the government-backed fund	20
Securing the labor	16
Regulation regarding forest utilization	9
Small business size and low capability	9
Conflict with local residents	7
Lack of local government interest and support	7
Securing the market to sell	7
Cultivation technique	4

3.3 Financial performance of the complex and sustainability of businesses

We define the success of the complex as successful planting in terms of survival rate and high likelihood of long-term sustainability that can cover operating cost and generate modest income. Some of them already began to generate significant income by harvesting the products, but in most cases harvest period has not yet arrived. In general, wood-cultivated ginseng or herbal plants require a longer period before harvest. Hence we evaluate only the complexes that have generated income.

There are a total of 12 complexes that haven't harvested at all, and more than 40 complexes have started harvesting but not in full scale.

Sales volume in 2012 ranges from 10 million won (9,090 US$) of a ginseng growing complex to 6,341 million won (5.7 million US$) of a wild greens (bracken) complex. Except for the mushroom and jujube growing greenhouse complexes, sales volume varies a lot year by year.

Among the commodities, shiitake mushroom is mostly successful in terms of financial performance with business sustainability. It also generates higher income per capita and higher net income per sales. Shiitake mushroom is greenhouse produced and intensively cultivated. Wild greens and herbal plants are less successful than shiitake. Wood-cultivated ginseng, which takes longer period than others before harvest, shows good financial performance once started harvesting.

Table 7: Financial performance of the complex by commodity

Commodity	total	successful	unsustainable	Success ratio
Wood-cultivated Ginseng	2	2	0	100
Shiitake	9	7	2	77.8
Wild greens	12	5	7	41.7
Herbal plants	16	8	8	50
Landscaping tree	1	0	1	0
total	40	22	18	55

Using the Logit model we analyzed which factors derived 'successful' and 'unsustainable' outcome in the table7. We used the dependent variable which came from the financial components for deciding the performance. In independent variables, we included qualitative characteristics of the complex such as the experience of farmer and the will for success. We believe that the experience of cultivating similar products before and the will for success of the manager positively affect the performance of the complex. A forest farmer who has the experience of cultivating a similar product is more likely to be successful than those who don't. When the manager has the strong will to succeed, he/she performs better. We also believe that the size of the complex is not a decisive factor for success, though certain size should at least be guaranteed to realize the economy of scale.

The result of the analysis is showed at the table8. The probability to be 'successful' when he/she has the experience and low will to success is 0.8196. The probability to be 'successful' when he/she doesn't have the experience and high will to success is 0.8826. In the average, the probability to be successful in the sample is 0.7396.

The difference of the probability to be 'successful' of farmers with high will between with experience and without experience is 0.1145. The difference of the probability to be 'successful' of farmers with the experience between high will and low will is 0.1775.

There are other important factors that are not included in the analysis because of data collection problem. We expect a better outcome if the business entity can prepare enough funds to cover the operating cost before the harvest period as shown earlier by the survey result. Otherwise, the complex is more likely to be managed poorly as time goes on and even be abandoned. We can't overestimate the importance of local government. Forestry and forest management need to be a high political

Table 8: Factors affecting the financial performance of the complex

Variable	Coefficient	Standard error	p-value	Average
Constant	-3.2205	1.2671	0.011	-
Experience	3.8371	1.3611	0.005*	0.425
Will to success	4.3407	1.5314	0.005*	0.4
Complex size	0.0340	0.0223	0.129	26.38

* p<0.1, ** p<0.05

Pseudo R-squared= 0.5758

priority of the head of a local government. Unfortunately, considering the longer period required to acquire the outcome of forest management, it is less likely that a head of a local government will emphasize forest management. We need to reemphasize the importance of proper forest management and influence them through various channels like central government, NGOs, local residents with the right to vote, and so on. Under the current system where local officers switch their roles in every 2 or 3 years, it is hard to expect professionalism and devotion from them. Nevertheless, we need good experts who administrate and monitor the scheme.

4 Implication

Based on the analysis, we can identify the factors that contribute to the financial success of the complex. They are farmer's will for success and previous experience to produce similar products, though we admit that there are other factors worth mentioning.

The type of complex can generate better insight if it is regrouped and included at the analysis. We classified into three types (forest land, flat land and green house) in the previous chapter. It can be regrouped more in detail as tourism farm complex (as in some wild greens in flat land), intensive production complex (greenhouse, some in flat land), and forest farm complex (most of forest land type).

There are positive and negative effects we can expect from the complex, though the negative effects are cause for concern only in a small number of cases. Positive ones include increase in farm income, proper forest management, enhancement of environmental function, and mountain village promotion. Negative ones can be damage to trees and forest land and decrease in the level of multi-functionality such as water storage, good landscape, and carbon storage.

The environmental function of forest can be pursued in different dimensions: that is, on an individual complex, total complexes or on total forest in Korea basis. In the last case, we can allow intensive and even unrestricted economic usage of certain portions of forest, if we can make the rest of forest functions better environmentally.

In order to secure the sustainability of the complex, the complex should generate enough income that can cover initial investment and operating cost, and make a profit that can keep the participants in the business. In the dimension of profit generation, the intensive production type or the tourism farm type seem to be suitable choices for the complex. But in this case, the negative effects of the complex are also more likely to come. Meanwhile, from a few cases of forest farming, which is less likely cause negative environmental effect, we can expect good stream of income.

How to look at the complex in view of agroforestry and balanced usage of forest land is a key factor in deciding which type is better or worse. Depending on where we place priority, the ideal types of the complex can be decided. Accordingly, the criteria for evaluating business performance can be changed as well.

The complex is aimed to have spillover effect on other farmers, such as encouraging them to manage and utilize mountains to be better off. However, except a few numbers of forest farmers who grow high-valued mushrooms, ginseng, and herb plants in big volumes, most forest farmers are small-scale, side-job farmers. It is hard to expect proper forest management and usage from them. In that sense, how to guide environmentally sustainable big forest farmers and how to group small-scale individual farmers to enjoy economy of scale are key factors for the success of the Forestry Products Production Complex scheme. We believe that this study can provide some hints, if not a solution, to lead successful sustainable agroforestry. The success of the forest farm-type complex depends upon keeping business sustainability by solving the insufficient income-generating problem, and the success of the intensive farm-type complex depends upon minimizing the negative environmental effect that can be caused by the complex and the requirement to restore the site when the complex goes out of business later on. How to balance the economic output with environmental concern is important in securing sustainable agroforesty.

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Synergies of Non-timber Forest Products and Commodity Chains:

A Preliminary Study for Small Scale and Private Forestland Owners

Yue-hsing Huang[1], Chin-shien Wu[2] and Pei-jung Wang[3]

1 Introduction

"Non-timber forest products" (NTFP), also known as "non-wood forest products" (NWFP), "non-wood forest products and services" (NWFPS), "special forest products" (SFP), and "non-traditional forest products" (NTFP) (Hammett and Chamberlain, 1998; USDA FS, 2001; Janse, 2002), are terms commonly employed to indicate multiple goods and services offered by forests, except for timber and environmental services. NTFP include food, fuel, fabrics, building materials, medicine, crafts, latex, resin, dyes, aromatherapy oils, fodder, and ornamental plants. Although NTFP have been indispensable to humans throughout history, they did not receive adequate attention from academia or forestry policies until the 1980s (Chamberlain, et al., 2000; USDA FS, 2001; Janse, 2002).

From the 1990s onwards, the world began to pay more attention to NTFP. For example, the Food and Agriculture Organization of the United Nations (FAO) declared "the promotion and development of non-wood forest products (NWFP)" as one of its focus areas in 1991. Similarly, Agenda 21 (UNCED Earth Summit 1992) expressed in chapter 11, section C, the importance of "promoting efficient utilization and assessment to recover the full valuation of the goods and services provided by forests, forest lands and woodlands." Complying with these principles, the Helsinki Final Act and the Declaration of Lisbon both emphasized the concept of diverse functions-oriented forest management to improve national and local economic performance and achieve other social goals (Janse, 2002). However, the growth of international NTFP trade and demand has led to overexploitation (Ticktin, 2004). Furthermore, developing NTFP may help local economies but may not aid conservation efforts. Therefore there should be a set of regulatory laws and legal assurances to manage NTFP (Belcher and Schreckenberg, 2007). Fortunately, countries such as the United States have incorporated NTFP development into national forestry management and invested academic and political support (Chamberlain, et al., 2000).

The demand and commercialization of NTFP has great market potential in Taiwan, but they have not traditionally been included in forest production value or considered in forestry policies. The current Taiwanese forestry is largely guided by the Taiwan Forestry Bureau's (TFB) implementation of a

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"Farmlands Afforestation Policy" since 1993, lasting for 20 years, to encourage small scale and private farmland owners to transform their paddy fields into forest. One of the problems is that private landowners have no stable income while managing the transformed forestland. Now the participating private land owners have since completed their contracts, and they face the dilemma of keeping or felling maturing trees. Due to conservation-oriented forestry policy, low market timber prices and high labor costs, Taiwan has a low timber self-sufficiency rate. In order to grow high-quality timber from small-scale private forest management, intensive tending on plantations is necessary.

This study investigates a method for enhancing NTFP incomes from private forestland during the phase of tree growth. Diverse scenarios such as farmlands afforestation, small-scale forestry and community forestry are considered. We used branches and small-diameter logs from thinning or pruning young or mature stands as materials, and developed products based on customer traits. Using a pilot project, we tried to increase voluntary participation of customers and cultivators. We also hope to encourage environmental awareness and increase willingness-to-pay through the construction of an intermediate product from small-scale forest management in Taiwan.

2 Materials and Methods

This study used branches and small-diameter logs from thinning or pruning young or mature stands to produce toy assembly kits as value-added application. Initial test subjects were lower grade elementary students. As the study grows, it is expected to expand to senior classes, even to adults, stimulating wood consumption and handicraft ability in Taiwan.

Through several experimental activities, the acceptance of the idea of assembling wooden toys and willingness-to-pay were surveyed. Workshops for private forest managers were run to investigate their willingness and ability to produce the toy assembly kits. In terms of school children handicraft tests, research was focused on 7-9 years old children from classes and outdoor events. Questionnaires were used to investigate willingness-to-pay and the enthusiasm for classes teaching how to assemble the toys.

3 Results and Discussion

This study surveyed willingness-to-pay for wooden toy assembly kits, focusing on parents of first and second grade elementary school children. 120 effective questionnaires were returned from 63 school classes and 57 outdoor natural education centers. The results showed that parents seldom bought wooden toys for their children. The majority of parents (61.3%) bought at most 1 wooden toy out of every 4 purchases. The main motives for purchasing wooden toys were environmental friendliness (54.5%), safety (48.8%), and diversifying children’s toys (31.8%). The main reasons for not buying wooden toys were difficulties in sourcing wooden toys (42.0%) and high costs (30.7%). According to these results, if these problems are addressed, there may be a large market for wooden toy assembly kits. One possible solution is to acquire raw materials and designs locally to make the toys more accessible and inexpensive. Nearly all parents (94.3%) supported the introduction of domestic timber products into handicraft and art school classes. Most parents could accept prices below 3.4 USD for a wooden toy assembly kit; urban parents could accept the price set by the school. The willingness-to-pay in urban outdoor classes was 11.3 USD and rural outdoor classes 6.2 USD in contrast. On the other hand, the willingness-to-pay in urban indoor classes was 5.2 USD and rural indoor classes 3.7 USD. The average willingness-to -pay was 3.6 USD, although 19 parents stated that they could accept the price set by the school. Parents' average willingness-to-pay at outdoor natural education centers was 5.8 USD, which was slightly higher than the indoor average.

We also conducted 43 questionnaires at the workshops for private forest managers around southern and eastern Taiwan. All of the participants were satisfied with the concept of toy making and product design. In detail, 51.2% were pleased with the description of the project, while 32.6% were happy with the practical demonstrations of the products. The majority of private forest managers (95.8%) were willing to produce these wooden toys in the future. Other ways and means for increasing income that were considered include expensive art goods (62.8%), essential oils (44.2%), and mushroom cultivating media (20.9%). Lastly, private forest owners wanted to get more information about woodwork techniques, further policy subsidies and industrial support from the government.

The governmental subsidies for farmland afforestation can be regarded as a form of environmental compensation as under the concept of payment for ecosystem services (PES). However, the marketization of intermediate products from man-made forest management could be seen as a new substitute way of conducting PES. There is great market potential if every elementary student could access the wooden toy assembly kits made from small logs and branches pruned during middle- to late-stage plantation pruning. According to the Ministry of Education, there were more than 1.37 million elementary students in Taiwan in 2011. Supposing that every single student pays 100 NTD for a small wooden DIY package every semester, this would come to total revenue of 9.3 million USD per year.

4 Conclusion

Based on these results, if the government can initiate a policy to construct a sound production and marketing chain for forest management, the cost of afforestation subsidies could be lowered by following PES theory. Private forest managers would be encouraged to implement plantation tending, use intermediate products from forest management to create a diverse range of special woody products, and establish marketing mechanism and production chains. Future timber supply would be guaranteed, and customer awareness of carbon reduction through afforestation, environmental protection and the potentials of wood utilization would increase. The development of a culture around wood use on a national level would also help influence local lifestyles to be more environmentally friendly.

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Community participation on rattan sustainable development in some ASEAN countries.

Aida B. Lapis[1]

Abstract

Rattan is a very important commodity in many Asean member countries. It is an invaluable natural resource endowed to most Tropical and sub tropical countries. About 10million people in the uplands of the Philippines, for example, in the long value chain depend on it for subsistence, livelihood and industry. In today's demand for organically natural, biodegradable and environment friendly products, rattan continuous to be sought after raw material from the forest manufactured into furniture, handicraft, ornaments and even as for food source and medicines.

The paper will present the results of a five year project where ASEAN countries were involved in developing plantations for various end uses of rattans. It will describe the element of community participation which is an essential approach to ensure the success of plantation establishment and rattan craft production at the village level. Moreover, empowerment of the community through capacity building is required for the local people to gain confidence to engage in a long term involvement that will lead to sustainable income generation.

Experiences and accounts on plantation establishment and product enhancement of countries such as Lao PDR, Vietnam, Thailand and the Philippines will be described. Also, the lessons learned in project implementation with several countries will be discussed.

Recommendations will be provided on the future possible steps to take in order to develop village scale economic activity and contribute to poverty reduction.

Key words: Rattans, ASEAN countries, community participation, plantation development and product enhancement, poverty reduction

Introduction

Rattan is a very important commodity in many ASEAN member countries. It is an invaluable natural resource endowed to most tropical and sub tropical countries. About 10million people in the uplands of the Philippines, for example, in the long value chain depend on it for subsistence, livelihood and industry. In today's demand for organically natural, biodegradable and environment friendly products, rattan continuous to be sought after raw material from the forest manufactured into furniture, handicraft, ornaments and even as for food source and medicines.

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The ITTO rattan project which was implemented in ASEAN countries harnessed the community participation for their own economic benefits and at the same time ensuring the environmental contributions of rattans in sustainable forest development. The strategy employed was the establishment of pilot rattan plantations which was directly a community approach that promoted the rattans as an economic commodity in the region. In the ITTO project the pilot plantations served as the primary activity that showcased the participation of the communities with interventions from other stakeholders. It is the component of the project where nursery, plantation establishment and utilization technologies were disseminated for application in order to improve the traditional rattan cottage industry.

Experiences and accounts on plantation establishment and product enhancement of countries such as Lao PDR, Vietnam, Thailand and the Philippines are described.

The paper presents the results of a five year project where ASEAN countries were involved in developing plantations for various end uses of rattans. It describes the element of community participation which is an essential approach to ensure the success of plantation establishment and rattan craft production at the village level. Moreover, empowerment of the community through capacity building as required for the local people to gain confidence to engage in a long term involvement that will lead to sustainable income generationis discussed. Also, the lessons learned in project implementation with several countries are included.

Materials and methods

The five year (2005-2010) project was implemented in seven ASEAN member countries executed by the Ecosystems Research and Development Bureau of the Department of Environment and Natural Resources in collaboration with the Forest Products and Development Institute of the Department of Science and Technology and the University of the Philippines College of Forestry and Natural Resources of the University ofthe Philippines at Los Baños, Philippines , with financial support from the International Timber Organization (ITTO), Japan.

The pilot plantations demonstrated the technologies on raising rattan in nursery by the community, establishment of plantationsand the care and maintenance in the field. The key elements are community organizing, enabling agreements, community action, site selection and the actual activities in establishing the plantations including the capacity building.

There were 7 countries of the ASEANwho participated in this activity of the ITTO project,however, for this paper four countries will be included namely: Lao PDR, Thailand, Vietnam, thePhilippines.

Choice of rattan species

The choice of rattan species (Table 1) used for plantation establishment was decided upon by the participating communities. They were guided by the technical staff of the respective governments and rattan experts across the region. The rattan species were selected based on the economic values, product to be developed and the availability of seeds and appropriateness of the site. The table 1 below presents the species used, economic values by country.

Table 1: Rattan species and economic values per country.

Country	Species	Economic Value
Lao PDR	Calamussiamensis, C. tenius, C. gracilis, C. solitaries	Edible shoots
Philippines	Calamusmerrillii	Cane, splits
Thailand	Calamuspalustris, C. rudentum, C. manan, C. longisetus, C. viminalis, C.peregrinus	Shoots
Vietnam	Calamustetradactylus, Daemonoropspierre	Splits, cane

Steps involved:

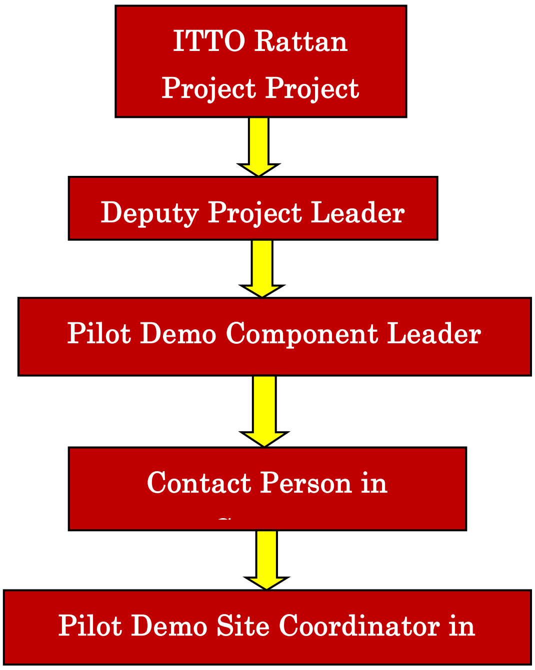

Figure 1: Organizational chart of the pilot demonstration

A. Organization

As a major component of the ITTO project, the establishment of the pilot plantations was implemented by country site coordinators, directly managed by the respective contact persons which in turn under the guidance of the pilot component leader (as shown in Fig. 1):

B. Organization of communities

The project supported the communities by encouraging them to organize, for example for the Philippines. Since the plantation site is within the protected area multiple use zone, the local authority known as the Protected Areas Management Board provided the guidance. In Lao PDR, villagers owning piece of land were grouped and village leaders cooperated by providing the leadership in rattan farming for shoot in particular thru the forestry agency. The same approach was adopted in Vietnam that thru the government agro-forestry agency, the communes who have forest allocations were consulted as to the integration of rattans plantation establishment in their farm lots. In Thailand, the pilot plantations for edible shoot were initiated by the forestry agency with the participation of villagers as provider of labour.

C. Capacity building

Prior to the establishment of plantations, the beneficiaries were capacitated through the conduct of training (Table 2) on nursery and plantation technologies, management of plantation including the sustainable harvesting and technologies for product development, enhancement of cane quality, finishing and control of pests and diseases. The project prepared the field guides for the various topics and training modules.Couching and mentoring were provided in the project duration and beyond.

D. Selection of sites

The selection of pilot areas (Table 3) were based on a criteria, including, accessibility, suitability of the bio-physical conditions for the growth of rattans, receptivity and social acceptability of the community for the project, acceptance and support of the government and local authorities, and economic relevance of rattans. The actual visit of proposed sites was done for the final selection of the site.

E. Community planning and actions

In any case, action planning with the participation of the commune, communities and villagers is an important element to the success of plantation establishment. They charted courses of action with technical assistance of the project contact persons and staff. The socio economic data were gathered, spot map of the community, the relative location of the nursery and plantation and the responsibilities of the members of the communities were outlined.

F. Establishment of plantations

Nursery Phase – the production of planting materials mostly by seeds was done.Commonly, the men are engaged in farming and other source of livelihood and employment. In all countries, adequate seedlings were out planted in locations selected and decidedupon by the communities on their targeted hectares. The project technical staff saw to it that the characteristics of the good planting stock are adhered to ensure the survival and growth.

Plantation establishment – The outplanting of raised seedlings is a joint activity by men and women,in all countries. The site preparation was done by family members and groups of families who signed out for specific area. The outplanting was done as a community wide activity. The hole digging, hauling of seedlingsand staking were done by men while the female put the seedlings in the hole and covered the seedling with soil. The maintenance and care of the plantations by foot patrol are continued by men.

While undertaking the activities, the communities, communes and villagers conducted regular meetings and discussed the progress of nursery and plantation phases. They shared experiences, problems met and solutions achieved with every member. The project staff, on the other hand, consistently coordinated activities and rendered options to meet constraints and potential hindrances that can possibly affect the project.

Results

Figure 2: Map of the ASEAN where the plantations were established

Locations of the plantations established are shown in Map of Southeast Asia are Lao PDR (40Has.), Thailand (25Has.), Vietnam (25has.) and the Philippines (60 Has):

Capacity building:

Figure 3: Field guides on Rattan Production and Utilization Technologies

Table 2: Trainings conducted, venue and participants

Title	Venue/ Date	Participants
Training Programs		
Training Program on Rattan Production Technologies	Bicol Natural Park Bahi, Lupi, Camarines Sur, Philippines 26-27 October 2006	Farmers, LGU executives
Training Program on Rattan Processing and Utilization Technologies	Bicol Natural Park Bahi, Lupi, Camarines Sur Philippines 24-25 November 2006	Farmers, LGU executives
Training Program on Rattan Production Technologies	PhungGia commune, Ha Tay Province, Vietnam 22-23 March 2007	Farmers and researchers from the Vietnam Forestry University
Training Program on Rattan Processing and Utilization Technologies	PhucTien Commune, HoaBinh Province, Vietnam 19-20 March 2007	Manufacturers of rattan baskets, hampers and other novelty products and researchers from the Vietnam Forestry University
Training Program on Rattan Production Technologies	Namxuang Forestry Research CenterNasaithong District, Vientiane Capital, Lao PDR 24-25 May 2007	Farmers, staff f the Forestry Research Center and representatives from World Wildlife Fund (WWF)
Training Program on Rattan Processing and Utilization Technologies	Napakuang Resort, Phonhong District, Vientiane Province, Lao PDR 21-23 May 2007	Handicraft manufacturers from the village, farmers, researchers and a representative from World Wildlife Fund (WWF)

Table 3: Rattan pilot demonstration sites, species and participants by country

Countries	Area of Plantation Established/ Enhanced/ Project Cost	Site/ Type	Number and Species of Seedlings Outplanted	Number of Participants
Philippines	a.30 has new plantation b.30 has plantation for enhancement	a.Barangay San Jose, LupiCamarines Sur, Bicol Natural Park (Protected Area) b.Kidapawan, North Cotabato (Plantation	13,000 seedlings (*Calamusmerrillii*) 10,000 seedlings (*Calamusmerrillii*)	30 22
Vietnam	25 has	PhucTien Commune, Ky Son District, HoaBinh Province (Forestland allocated to local communities)	20, 000 seedlings (*Calamustetradactylus*, *C. pierre*)	35
Lao PDR	40 has	Villages (5) a. Sopphouane b. Thadindeng c. Lingsan d. Xangnhai e. Paksoun *(forest area, old paddy field, homegarden)*	58,000 seedlings (*Calamussolitarius, C. tenuis, C. gracilis, C. siamensis)*	66
Thailand	25 ha a. 18 ha (enhancement) b. 7 ha new plantation	a. Nai Chong Silvicultural Research Station, Trang Province and Song KhlaSilvicultural Research Station Song Khla Province b. Khao Ban TudSilvicultural Research Station, Trang Province, LumpaoLumsaiSilvicultural Research Station and Song KhlaSilvicultural Research Station Song Khla Province *(Silvicultural Research Stations/Forest)*	*(C. palustris, C. rudentum, C. manan, C. longisetus)* *(C. viminalis, C. peregrines, C. palustris, C. longisetus)*	30

Community participation

Lao PDR –The participating farmers own the land thus benefits from rattan edible shoot production was directly for the farmers, thus the project was easily accepted. Raising seedlings is generally dominated by the women participation. Individual farm lot owners raised their own seedlings and some procured seedlings from the governmentthru the project. The village leader played a big role by making other farmers aware of rattan growing by word of mouth and informal gathering. Since the leaders were receptive to the project and authoritative in the village, coordination was made accordingly.

Thailand- The use of government land for rattan plantation for specific duration was requested from the concerned authorities. Moreover, the ownership or access to rattan resources is in conformity to the existing forestry regulations. Seedlings were raised by the forestry agency with local growers.

Vietnam- The participation of the commune was arranged by the commune leader thru the agroforestry agency. The commune with forest allocations was enlisted as participants and they will co managed the plantations and the future benefits. The communes also established common nursery structure where seedlings were accessible to other members

Philippines- The community around the protected area organized themselves locally and specifically for the rattan project. It was a recognized organization by the protected area management board. As an instrument for the resource use around the protected area, the PO applied for the Protected Area community Based Resources Management Agreement with the DENR. This agreement provides the PO the right to sustainably manage and utilize the rattans. Raising planting materials was done by individual family and groups of family in the household backyard and common nursery, respectively. Women took care of the seedlings because often times men have major farming work and employment a source of income.

Remuneration for nursery and plantation establishment was not on daily labour payment but regarded as incentive in participation (Philippines). The families were compensated according to the acceptable seedlings raised and planted in the field and a percentage was set aside and contributed voluntarily for the organization's common fund.

Discussions

Among the ASEAN countries, rattan is a valuable non timber resource. It is generally sourced from the wild and industries thrived for decades and artistry was transferred from one generation to generation. Among the more than 600 species of rattan from the wild, the countries selected the species with economic value and high potential for income generation.. The selection was left to the communities to decide as shown in Table .Recently the establishment of plantations was deemed necessary when stocks from the natural stands dwindled. While there are traditional and indigenous ways observed by different countries, the need to develop plantations requires the intervention of the States with the application of rattan production and utilization technologies.

The communities that joined in the project from the four countries namely Lao PDR, Thailand, Vietnam and the Philippines underwent the training courses on production and utilization technologies. By doing so, they became aware of the technical know- how to produce the planting materials and how to establish rattan plantations. In like manner, the technologies in handling raw materials (as cane), ensure the quality of canes and extraction of other products (edible shoots) were disseminated. As shown in Table 2, training courses were conducted and attended by farmers, staff of the government agencies, researchers, handicraft workers and other key players in rattan value chain.

In search for a strategy for forest conservation, community based forestry evolved in various countries due to the presence of people dependent on forest resources.Forest dwellers population ballooned and caused pressures to the forest products through unscrupulous harvesting. Moreover, the in dire need for livelihood both for subsistence and generation of income, need of the cottage and large furniture industries subjected the rattans to heavy extraction. Communities understand the scenarios besetting the rattan development; on the other hand, they also regarded themas an economic commodity for various products derived from rattans. Since the communities are the direct beneficiaries from rattan, it is quite easy for them to adopt to the government projects that effect sustainable development. Likewise, on environmental considerations, rattan is an agent of forest conservation as an integral part of the forest ecosystem. As an example, trees have to be available in the plantation site to provide the mechanical support for rattan growth.

Conclusions

Community participation for the sustainable development of rattans comes in various phases of plantation establishment. It is an approach that ensuresempowerment which enables the stakeholders to provide their inputs to realize socio economicbenefits address environmental concerns and contribute to conservation. Equipping the communities of knowledge on rattan economic values aside from cane such as edible shoots, dyes, wine, medicine/pharmaceuticals widen the choices for plantation objectives. The disseminated production and utilization technologies gave them the needed support to decision making and management of the resource close to them which can make them self reliant and independent in the long run.

The different levels in the organizational structure of the community and other stakeholders proved to contribute to the rattan sustainable development through capacity building and plantation development. Role of the community leaders, cooperation of the members, coordination of the government, political will of the local executives, dissemination of the appropriate technologies, among others, have to work hand in hand in all phases of rattan sustainable development.

While community participation adds to success in managing non timber forest resources other impediments have to be resolved. There are issues on the tenure of participating communities, inadequate government support, rattan is loosely considered in the government plantation program, parallel livelihood projects to make use of the rawmaterial is wanting, post establishment support activities have to be in place, to mention a few.

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[CS3-5]

Impacts of Community-based Forest Certification on Small-scale Teak Forestry

Case Study in Gunung Kidul, Yogyakarta, Indonesia

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1 Introduction

Teak (*Tectona grandis*) is one of the most valuable multi-purpose hardwoods in the world (Keogh 1996; Odoom 2001; Bhat & Ma 2004; Keogh 2009). Its properties include both technical features and appearance, such as beauty, strength accompanied by light weight, durability, dimensional stability, non-corrosion, and resistance to termite, fungus, chemical, water, and weather (Keogh 1996; Odoom 2001; Keogh 2009). Therefore, teak is widely known in the world market and has an excellent reputation for its wood quality (Keogh 2009).

Till 1950, the major area under teak plantation was in Java, Indonesia (Pandey & Brown 2000), and the current area under teak forests in Java constitute more than 35% of the total teak forest area in the world (Purnomo et al. 2009a). Teak is by far the most economically important species grown on the state forests in Java (Peluso 1992a; Pandey & Brown 2000), and the Javanese State Forest Company (*Perum Perhutani*) has been the major producer of teak (Purnomo et al. 2009b). Indonesia is also one of the largest manufacturers of teak products (Pandey & Brown 2000). The contribution from the furniture industries in Java to global trade is approximately 2% (Purnomo et al. 2009a), and the growth of this industry is strongly associated with employment issues in Indonesia (Purnomo et al. 2011). Thus, teak has played an important role in the Indonesian political economy (Peluso 1992b). Furthermore, the use of teak in furniture making has long been a part of Javanese culture, and the Javanese have considered teak and items made from teak as a valuable part of their culture (Purnomo et al. 2009b).

An imbalance between the supply and demand of wood has been a serious problem in the forestry sector in Indonesia, and because of this imbalance, the shortage of timber as a raw material has been an important factor behind illegal logging that leads to serious deforestation and forest degradation (Guritno 2000; Wardojo 2003; Noordwijk et al. 2007; Obidzinski & Chaudhury 2009; Obdzinski & Dermawan 2010; Rohadi et al. 2010). State teak forests managed by the state forest company are no exception. After the collapse of the Soeharto regime, forest plundering was escalated in Indonesia between 1998 and 2004 (Awang et al. 2006), and log production by the state company decreased rapidly (Forestry Statistics, Ministry of Forestry, Indonesia 2001-2011). Consequently, the

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wood industries and log traders have been finding it difficult to obtain larger diameter logs, and there are concerns that furniture export would shrink because of the collapse of teak log supplies.

In contrast, privately owned forests (POFs) (called *Hutan Rakyat* in Indonesia), which consist of home gardens (*Pekarangan*), dry land (*Tegalan*), and wooded land (*Wono* or *Alas*) fully owned by communities (Figure 1), have been rapidly expanding in Indonesia. POFs have been increasingly important contributors to wood supply (Pramono et al. 2010), and the amount of timber harvested by the communities has dramatically increased during the last decade (Hinrichs et al. 2008). Thus, some wood industries have predicted that communities and smallholders will produce more teak timber than the state forest company in the future (Purnomo et al. 2009b).

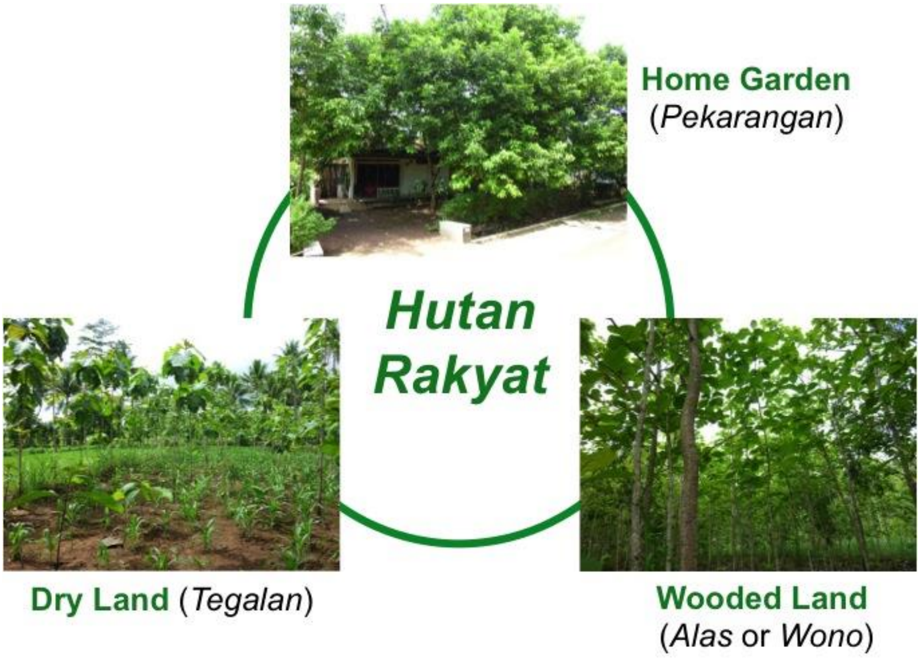

Figure 1: Form of a privately owned forest (*hutan rakyat*) in Indonesia
Source: Field research (2010)

Previous studies have showed some common characteristics of POFs: 1) POFs are managed by family members and/or communal farmers' groups and there are no professional organizations for collective management of POFs; 2) there are no formal forest management planning systems; 3) POFs play a role in farmers' saving and/or stock, which can provide cash flow during urgent situations and/or for special purposes; thus, harvesting is conducted based on the farmers' needs (*Tebang Butuh*) and trees are cut even if they are still immature; and 4) POF farmers do not have high bargaining power with traders and industries, so the timber trade mechanism is beyond the farmers' control (Awang 2005a; Awang 2005b; Ichwandi et al. 2005; Widayanti et al. 2005; PKHR 2006; Awang et al. 2007; Ichwandi et al. 2007; Hinrichs et al. 2008; Simon 2008). As opposed to the state forests, POFs are expected to produce teak to meet the demand for teak timber; however, POF farmers are concerned about securing a stable wood supply and achieving sustainable forest management (Awang 2005a; PKHR 2006; Simon 2008).

In order to achieve stable wood supply and forest conservation of POFs, a project on Privately

Owned Forest Management Units was conducted in 2004 in Gunung Kidul, Yogyakarta. Subsequently, a local people's cooperative association (KWML-*Koperasi Wana Manunggal Lestari*) was established in 2006, and community-based forest certification through the Indonesian Eco-label Institute (LEI-*Lembaga Ekolabel Indonesia*) was introduced to improve the small-scale teak forestry managed by the local people. The question arises whether the community-based forest certification can contribute to the management of small-scale teak forests in a sustainable manner. The objective of this study is to examine the impacts of the forest certification on 1) forest management and 2) timber marketing.

2 Research Methods

2.1 The Research Site

The Gunung Kidul district is located in the south of Yogyakarta Special Province, and has a total area of 148,536 ha (BPKH 2006). There are 18 sub-districts, 144 villages, and 1431 sub-villages in the district. The Gunung Kidul district is in a karst area, which always experiences shortage of water, especially in the dry season.

Table 1: Production volume trend in privately owned forests in Gunung Kidul

Year	Teak	Total	Ratio of Teak
	(m^3)		(%)
2006	69937	81370	86
2007	59403	70614	84
2008	72789	80329	91
2009	85404	95461	89

Source: Statistics of Gunung Kidul District Forest Agency, Fujiwara et al. (2011)

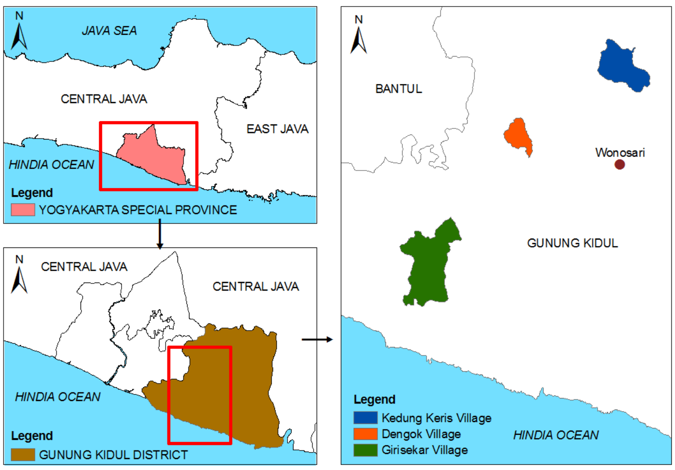

Figure 2: Location of Kedung Keris, Dengok, and Girisekar Villages, Gunung Kidul, Yogyakarta
Source: Provided by Mr. Yanuar Adrian Bomantara (Faculty of Forestry, Gadjah Mada University)

The Gunung Kidul district is well known for pursuing one of the few successful afforestation and reforestation projects in Indonesia. Communities have rehabilitated barren land to improve uncultivable soil conditions and evade water shortage during the dry season (Hinrichs et al. 2008; Nawir et al. 2007). To date, the forest area in Gunung Kidul has grown to 29,341 ha, which is approximately 20% of its total area, and approximately 55% of the forests are POFs dominated by teak plantation. In 2009, 95,461 m^3 logs were produced in the POFs, out of which, approximately 89% were teak logs (Table 1). KWML manages 815.2 ha of certified forests across three villages: 184.3 ha in Kedung Keris village; 229.1 ha in Dengok village; and 401.8 ha in Girisekar village (Figure 2). The maximum production volume including all tree species (e.g., teak, mahogany, and acacia) by KWML was 135.5 m^3 per month in the three villages.

2.2 Research Method

Field research was intermittently conducted between January 2010 and September 2012. Key informant interviews were conducted with the union head and board members of KWML, heads of POF farmer groups and its association, heads of sub-villages at Kedung Keris, Dengok, and Girisekar villages, and the president of a furniture company which has Chain of Custody (CoC) certification of LEI in order to examine impacts of the forest certification on forest management and timber marketing. Semi-structured interviews were also conducted with local farmers based on a questionnaire, and it included questions about: 1) privately owned land, 2) planted trees and management method in POFs, 3) household economy, 4) village livelihood, and 5) activities of farmers' groups and the cooperative association. During the interviews, secondary data, such as statistics, documents, and materials related to POF management, and activities of the cooperative association were also collected from the offices of the district forest agency, villages, KWML, and local NGOs.

3 Research Findings and Discussion

3.1 Impact on Forest Management

In the forest certification acquisition process, a 3-level organizational structure for POF management has been established at the research site, which comprises the cooperative association (KWML) for joint business at the district level, the Association of POF Farmer Groups (*Paguyuban Kelompok Tani Hutan Rakyat*) for joint forest planning at the village level, and the POF Farmer Group (*Kelompok Tani Hutan Rakyat*) for POF management at the sub-village level (Figure 3). These organizations work together toward the collective action of forest management. The planned joint business of KWML includes not only forestry but also agriculture, livestock business, trading, marketing, industry, and distribution of goods and services. The joint businesses that have been actually implemented by KWML are 1) buying and selling of certified timber, 2) buying and selling of fertilizers, and 3) lending of chainsaws.

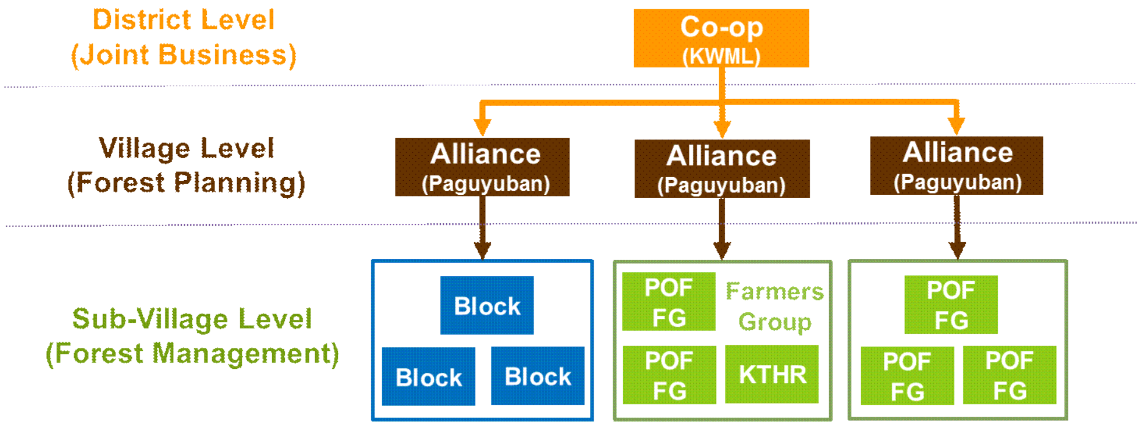

Figure 3: Organizational structure of privately owned forest management

Source: Field research (2010)

At the same time, various rules and standards associated with forest management have also been established by each organization. A growth increment (135.5 m^3 per month) for trees in three villages was also identified through the forest certification acquisition process, and this standard has greatly contributed to the prevention of over-cutting of trees in the three villages. In another example, a PKTHR, called Margo Mulyo, in the Kedung Keris village has clearly stipulated rules and guidelines for forest management, such as 1) reporting to the broad community when they want to cut trees, 2) replanting 10 times the number of trees cut, 3) preventing clear cutting on their land and allowing cutting only up to a maximum of 25% (selective cutting), and 4) imposing penalties equal to 1 million Indonesia Rupiah when the rules are violated. PKTHR Margo Mulyo has also established rules regarding the tree cutting age, in which members are allowed to only cut teak and mahogany trees older than 15 years and acacia and other trees older than 10 years.

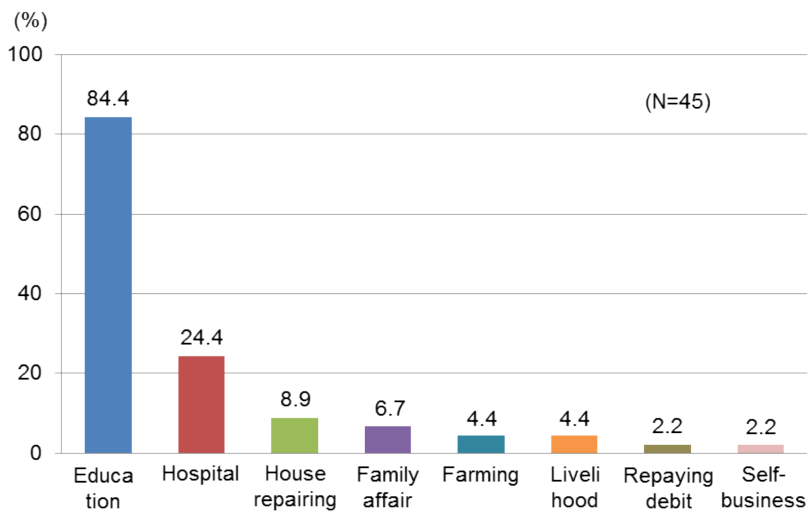

Figure 4: Reasons why respondents borrow money in the Kedung Keris village

Source: Field research (2010)

However, the findings showed that approximately half of the respondents in the three villages had experienced cutting of young trees (less than the predetermined age by their organization) as "traditional harvesting" (i.e., *tebang butuh*). In the Kedung Keris village, where relatively more number of respondents had this experience, the local farmers borrowed money mainly for the payment of their children's school fees (Figure 4), and the respondents mentioned that they could not borrow money again until they had repaid the previous debt, even if they needed money urgently. Thus, the PKTHRs have established rules regarding the tree cutting age logging and have suggested that the members use other alternative options in order to abide by the rules; however, the rules have not been followed appropriately by the members for economic reasons. In addition, PKTHR has also attempted to provide micro-loans in their appropriate capacity, but it has not been accomplished because of limited financial capital.

3.2 Impact on Timber Marketing

The majority of respondents sold teak logs to local timber traders. However, because they could sell at a higher price (by more than 10 to 15%) to KWML, some members sold their logs to KWML. Table 5 indicates the standard purchase price by KWML (as of December 2009). As stated earlier, the fact that POF farmers do not have high bargaining power with traders and industries has been one of the major issues of POF management in Indonesia. Therefore, KWML has attempted to implement buying and selling of certified timber in order to give higher timber price to the KWML members. However, because promoters of the forest certification stirred up local farmers' interests in forest certification by promising 20–30% higher timber prices as the premium price (Hinrichs et al. 2008); the local expectation for the premium price was very high. However, a large gap exists between the asking price by the members and the standard purchase price by KWML. In addition, buying and selling of certified timber had been suspended in 2009 because of limited market demand for certified timber. Although KWML has made efforts such as sending timber samples to trading partners, it has not expanded its trading partners nor developed a market for certified timber sufficiently enough to meet the expectations of the members. Therefore, the forest certification has not generated economic benefits or incentives for the KWML members. On the other hand, KWML has already obtained certification from the Indonesian Timber Legality Assurance System (SVLK-*Sistem Vertifikasi Legalitas Kayu*), which was launched in 2010 by the Indonesian government under FLEGT (Forest Law Enforcement, Governance, and Trade) Voluntary Partnership Agreements.

A limited number of LEI CoC-certified companies is also a big issue for buying and selling certified timbers. There are only two companies that have obtained LEI CoC certification in Indonesia. Since one of these two companies targets only timber derived from natural forests, there is virtually only one company that can accept the LEI-certified timber produced from POFs (Harada 2010), including the KWML timber. In September 2010, the company produced furniture with LEI-certified timber and used metal tags and barcode for tracking (Figure 5). However, when we revisited the furniture company in September 2012, they had suspended the production of furniture with the LEI-certified timber. According to the company's president, they had introduced LEI certification on a trial basis between

2007 and 2010 in order to cooperate in expanding the use of the LEI-certified timbers. However, their business partner (e.g., a French furniture company) has displayed high demand for FSC (Forest Stewardship Council)-certified timbers, TFT-certified timbers, and legally verified timbers (SVLK timber) because LEI-certified timbers are not well known in the European market. Consequently, they have also suspended the production of furniture with the LEI-certified timber and are selling furniture only with FSC-and TFT-certified and legally verified timbers based on the demand from their business partner. Thus, the expansion of CoC certification is a key point for supplying LEI-certified timber in the domestic and international markets (Harada 2010). In order to accomplish this, accession to international accreditation bodies, communication of information through English websites, promotion of mutual recognition along with other certifications, and such additional measures are also important for promoting LEI among the buyers, particularly in high potential markets (Maryudi 2009).

Table 2: Standard purchase price of teak logs by KWML (as of December 2009)

Log grade (Diameter)	Price (Indonesian Rupiah per m^3)
DL (10–13 cm)	700,000
OP (15–19 cm)	1,450,000
OD (20–28 cm)	2,450,000
OGD (30–40 cm)	3,600,000

Source: Field research (2010), Fujiwara et al. (2011)

Figure 5: Metal tag and barcode for LEI CoC certification
Source: Field research (2010)

4 Conclusion

The findings showed the impacts of forest certification on forest management and timber marketing in small-scale teak forestry. In terms of the impact on forest management, a 3-level organizational structure for POF management and various corresponding rules have been established for the forest certification acquisition process. Currently, harvesting is conducted for trees below the identified growth increment (135.5 m^3 per month), and the new organizational structure and rules contribute to managing the small-scale teak forests in a sustainable manner. However, approximately half of the respondents in this study follow traditional harvesting (i.e., *tebang butuh*) practices. Thus, as Hinrichs et al. (2008) also pointed out, this harvesting system is unlikely to change immediately after the certification.

With regard to the impact on timber marketing, KWML attempted to conduct joint buying and selling of certified timbers to increase the bargaining power and timber price, but still a large gap exists between the asking price of the members and the standard purchase price of KWML. In addition, to make the situation even worse, buying and selling of certified timber had been suspended by 2009 because of limited market demand for their certified timber; moreover, the unique LEI CoC-certified furniture company, which was capable of accepting KWML timbers, also stopped the production of furniture with LEI-certified timbers because of limited market and low demand from their business partner. Therefore, the current situation of LEI certification in timbers is unlikely to generate economic benefits and incentives for the local farmers. In contrast, KWML could obtain the certification from the Indonesian Timber Legality without particular efforts. Indonesia is one of the largest manufacturers of teak products and a major portion of these products is exported to Europe and North America (Pandey & Brown 2000), the countries that have enacted strict laws on illegal logging and its trade (i.e., The Lacey Act and EU Timber Regulation). Thus, legality verification, a component of forest certification, has been increasingly important in the global market and has the potential to open a new market for small-scale teak forestry in Indonesia.

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Note

This proceeding is compiled based on information from Fujiwara et al. (2011) and an unpublished draft prepared for an international journal.

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[PS01]

Examining the optimum method to extract logging residues in Nasunogahara area, Tochigi prefecture, Japan

Chikara Nakahata[1], Kazuhiro Aruga[1], Ryo Uemura[1], Masashi Saito[2] and Kanae Kanetsuki[3]

1 Introduction

An agrarian organization in the Nasunogahara area in Tochigi Prefecture is willing to conduct thinning operations and extract thinned woods for woody biomass power generation in cooperation with a Forest Owner's Cooperative in Nasushiobara City in order to nurture river resources as well as maintain forests for soil and water conservation. Nakahata et al. (2011) investigated current operations of extracting thinned woods of A Forest Owner's Cooperative in Nasushiobara City and mechanized operations of B Forest Owner's Cooperative in Nasu Town. Then, improvements of efficiencies and costs by mechanization were discussed. As a result, economic balances would be improved by selling logging residues at the price of 1,000 yen/m^3 at landings in addition to selling timbers to a log market with mechanized operation system on aggregated forestry operation sites which merged small forests in order for large forestry machines to work efficiently.

Forest ownership in Japan is characterized by a large number of small, fragmented, and scattered forest owners (Forestry Agency 2009). Forest ownership in this region is the same situation. Therefore, it is difficult to aggregate forestry operation sites in this region even though private forests are located on relatively gentle slope areas and forest road networks have been well established. Thus, the optimum method to extract logging residues on such a small, fragmented, and scattered forest should be examined in contrast with mechanized operation system on aggregated forestry operation sites.

Niyodo town, a local community in the Kochi area of southwestern Japan, has recently started a government-subsidized woody biomass utilization project (Suzuki et al. 2009). The project collects logging residues for a processing plant using three systems: (1) a large scale logging contractor operation, (2) a medium-scale system operated by a forestry cooperative, and (3) a small scale system operated by individual forest owners. Although the expected largest sources of logging residues were large-scale systems, the small-scale system procurement was the largest in fact. Therefore, a small scale system by individual forest owners would be important to extract logging residues on such a small, fragmented, and scattered forest in Japan as well as in this region.

In this study, small scale systems operated by a private logging contractor and an individual forest owner were investigated. Then, operational efficiencies were analyzed and equations to estimate operational costs of small scale systems were established. Lastly, the optimum method with the highest

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economic balances was examined and available amounts of logging residues were projected in Nasunogahara area.

2 Operational efficiencies and costs of small scale systems

2.1 Study sites

The study sites were located at Nasushiobara City in Tochigi Prefecture, Japan (Figure 1). Study site 1 was a 45-year-old Japanese cedar plantation forest. Study area was 0.26 ha, average slope angle was 2 degrees, stand density was 2,000 stem/ha, average DBH was 24.5 cm, average tree height was 23.5 m, and average stem volume was 0.56 m^3/stem. Thinning operation and thinned wood extraction were conducted with chainsaw felling and processing (Kyoritsu CS42RSH/40RV95), mini forwarder forwarding (Chikusui Canycom Yamabiko BFY1001), and truck transportation (loading capacity 4 ton) to a chip production factory by a private logging contractor (Photo 1 and 2). Thinning rata of stem was 26.8%. The average DBH, tree height, and stem volume of thinned woods was 16.8 cm, 17.7 m, and 0.25 m^3/stem, respectively. Therefore, the thinned wood volume was 134 m^3/ha and thinning rate of volume was 12.0%.

Study site 2 was a 42-year-old Japanese cypress plantation forest. Study area was 0.25 ha, average slope angle was 11 degrees, stand density was 1,450 stem/ha, average DBH was 25.5 cm, average tree height was 12.6 m, and average stem volume was 0.32 m^3/stem. Selection felling operation and felled wood extraction were conducted with chainsaw felling and processing (Husqvarna 36) by an individual forest owner, fork-shovel (Komatsu PC40 with Marujun IFZ55) and truck transportation (loading capacity 2 ton) by a private logging contractor. Only felling and processing operations by an individual forest owner were investigated in this study site. Residual trees were naturally generated broad-leaved trees and some well-grown Japanese cypress. The average DBH, tree height, and stem volume of felled woods was 22.2 cm, 11.8 m, and 0.30 m^3/stem, respectively.

2.2 Results

Productivity of felling operations by a private logging contractor in the study site 1 and by an individual forest owner in study site 2 were 10.3 m^3/h and 6.35 m^3/h, respectively. The productivity by a private logging contractor was higher and that by an individual forest owner was lower than that by a worker of forest owners' association (Nakahata et al. 2011) although the average stem volume of felled woods in study site 2 was larger than that in study site 1.

Productivity of processing operations by a private logging contractor in the study site 1 and by an individual forest owner in study site 2 were 3.57 m^3/h and 2.14 m^3/h, respectively. Productivities by a private logging contractor and by an individual forest owner were lower than that by a worker of forest owners' association (Nakahata et al. 2011).

The average forwarding distance and volume in the study site 1 were 92.2 m and 1.23 m^3, respectively. Productivity was estimated as 4.27 m^3/h. The productivity by a private logging contractor was lower than that by a worker of forest owners' association, 5.07 m^3/h (Nakahata et al. 2011) because loading operations were manually conducted in this study while those were conducted with mini grapple-loader by a worker of forest owners' association although unloading operations were conducted with truck crane in both sites.

Direct operation expenses with private logging contractors and individual forest owners were estimated with productivities and hourly operation expenses consisted of labor (1,300 yen/h) and machinery expenses (Table 1 and 2). In a small scale system operated by individual forest owners, some extracting operations of small sized logs were conducted without machines. Therefore, extracting operation costs by individual forest owners without machines in study site 2 was estimated with walking velocity assumed as 1.7 km/h (0.4 m/s).

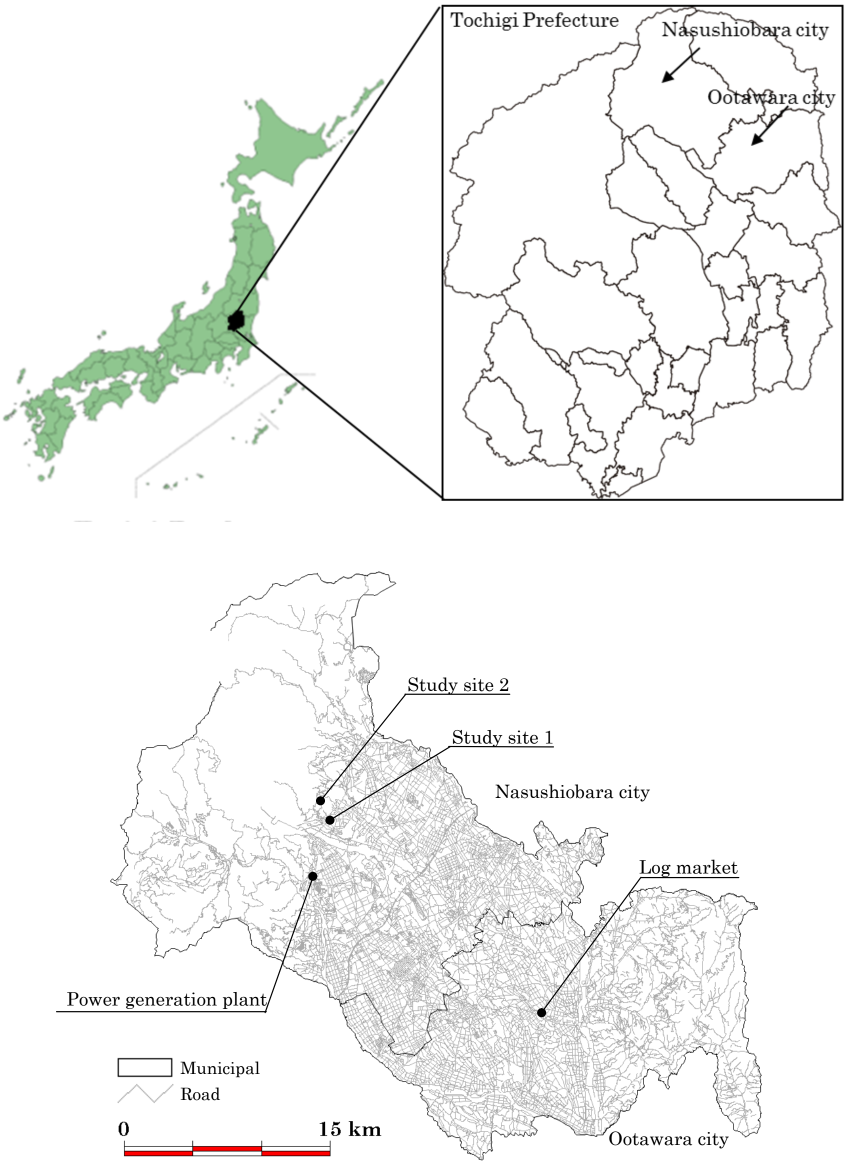

Figure 1: Study site

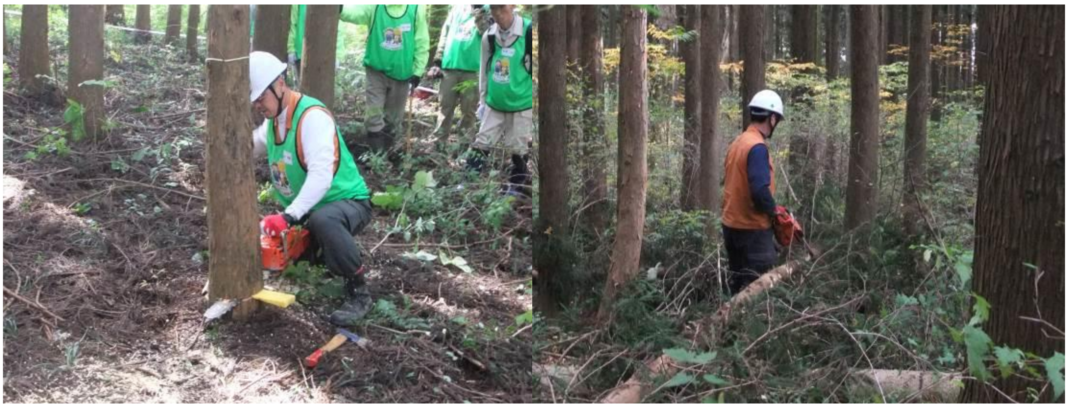

Photo 1: felling (left) and processing (right) operations by a private logging contractor

Photo 2: Forwarding operations by a private logging contractor

Table 1: Direct operation expenses with private logging contractors

Machine	Operation	Expense (yen/m^3)	Reference
Chainsaw	Felling	$(85.1Vn+60.8)/Vn$	Zenkoku Ringyo Kairyo Fukyu Kyokai 2001
Chainsaw	Processing	$(349.3Vl+51.6)/Vl$	Zenkoku Ringyo Kairyo Fukyu Kyokai 2001
Mini forwarder	Forwarding	$351+2.48L_F$	Japan Forest Technology Association 2010
4-ton Truck	Transportation	$278+54.4L_T$	Sawaguchi 1996

Vn is the stem volume (m^3/stem), *Vl* is the extracted volume (m^3/stem), L_F is the forwarding distance (m), and L_T is the transportation distance (km).

Table 2: Direct operation expenses with individual forest owners

Machine	Operation	Expense (yen/m^3)	Reference
Chainsaw	Felling	$(247.9Vn+60.6)/Vn$	Zenkoku Ringyo Kairyo Fukyu Kyokai 2001
Chainsaw	Processing	$(650.6Vl+113.1)/Vl$	Zenkoku Ringyo Kairyo Fukyu Kyokai 2001
Manual	Forwarding	$51.28L_F$	
350-kg truck	Transportation	$1,199+319.7L_T$	Forestry mechanization society 1999

Vn is the stem volume (m^3/stem), *Vl* is the extracted volume (m^3/stem), L_F is the forwarding distance (m), and L_T is the transportation distance (km).

3 Examining the optimum method

3.1 Study site and Data

The study site is Nasushiobara city in Tochigi prefecture, Japan (Figure 1). The gross area of Nasushiobara City is 59,280 ha, and the forest area is 38,689 ha (65% of the gross area). The area of national forests is 24,981 ha and that of private and local government forests is 13,708 ha. In this study, major plantation species such as Japanese cedar and Japanese cypress owned by privates and local governments were analyzed. Privates and local organizations own 7,340 sub-compartments of Japanese cedar comprising 2,850 ha, and 2,521 sub-compartments of Japanese cypress comprising 1,103 ha. These forests are mainly 45–55 years old. The northern parts of Nasushiobara City are mountainous. However, they are almost all national forests, whereas private and local government forests are located on relatively gentle slopes. Therefore, the average slope angle is relatively low (10°) and the road network density is relatively high (27 m/ha).

Forest-registration data (stand ages, tree species, and site indices) and GIS data (information on roads and sub-compartment layers) from the Tochigi Prefectural Government were used in the study, as were 10-m-grid digital elevation models (DEMs) from the Geographical Survey Institute. These materials and the GIS were used to extract profitable sub-compartments as production forests and to estimate available amounts of logging residues.

Privates and local governments of Nasushiobara City own 6,342 sub-compartments of Japanese cedar comprising 2,464 ha and 1,862 sub-compartments of Japanese cypress comprising 839 ha based on 10-m meshes. The number and area of sub-compartments on 10-m meshes were 16% less than those of the actual sub-compartments because there were small sub-compartments of less 0.01 ha that could not be recognized with 10-m meshes.

3.2 Methods

In this study, the optimum method to extract logging residues were examined in the following order: 1) sub-compartments for thinning and final felling operations were selected based on stand ages; 2) supply potentials were estimated based on the cutting and extraction rates; 3) forwarding and transportation distances were estimated; 4) total expenses for thinning and final felling operations with each operation system were estimated; 5) incomes were estimated; 6) economic balances were estimated; and 7) the optimum method with the highest economic balances was examined.

Sub-compartments with thinning and final felling operations were selected based on stand ages (Table 3). Supply potentials of timber and logging residues were estimated using cutting rate (*Cr*), extraction rate (*Er*), timber rate (*Tr*), and logging residues rate (*Lr*) (Yamaguchi et al. 2010). Forwarding distances were estimated as average distances from the landings to all grids within the sub-compartments. Landings were set within grids in such a manner as to minimize their distances from the roads, the centers of gravity in the sub-compartment, and the power generation plant. Transportation distances from the landings to the power generation plant or the log market were calculated using the shortest path algorithm, i.e., the Dijkstra method (Dijkstra 1959). If landings were not on existing roads, nearest grids on existing roads from landings were set as the new landings. Then, distances from landings to the new landings by taking into account the detour ratio that was referenced from the physiographic division (Kobayashi 1997) were added in forwarding distances. The terrain of the study site is relatively gentle; therefore, the detour ratio was set to 0.3.

Table 3: Harvesting condition for each operation classified by stand age

	First thinning (pre-commercial)	Second thinning (commercial)	Final felling (clear cutting)
Stand age (years)	25-39	40-59	60-
Cutting rate (*Cr*)	25%	35%	100%
Extraction rate (*Er*)	80%	100%	100%
Timber rate (*Tr*)	0%	49%	81%
Logging residue rate (*Lr*)	100%	51%	19%

Costs for first thinning operations were estimated with the following operation systems: 1) all operations conducted with forest owners' association (Table 4), 2) all operations conducted with private logging contractors, and 3) all operations conducted with individual forest owners without labor expenses of individual forest owners (Table 5). Labor expenses of individual forest owners were not considered because individual forest owners assumed to get incomes from selling logging residues rather than conducting extraction operations. Costs for second thinning and final felling operations were estimated with the following operation systems: logging residues were harvested with forest owners' association, private logging contractors, or individual forest owners after timber harvesting with forest owners' association. Since logging residues harvesting with individual forest owners were manual operations, extraction distances by individual forest owners were assumed to be limited within 20 m.

Table 4: Direct operation expenses with forest owners' association

Machine	Operation	Expense (yen/m^3)	Reference
Chainsaw and Grapple-loader	Felling and bunching	$(138.7Vn+304.2)/Vn$	Nakahata et al. 2011
Processor	Processing	$(222.2Vl+241.5)/Vl$	Nakahata et al. 2011
Forwarder	Forwarding	$564+0.50L_F$	Nakahata et al. 2011
8-ton Truck	Transportation	$627+48.7L_T$	Sawaguchi 1996

Vn is the stem volume (m^3/stem), *Vl* is the extracted volume (m^3/stem), L_F is the forwarding distance (m), and L_T is the transportation distance (km).

In addition to these direct expenses, indirect operation expenses were estimated. Strip road establishment expenses, machine transportation expenses and handling fees associated with the log market were considered as indirect operation expenses. Strip road establishment expenses were estimated with unit strip road establishment expenses (yen/m) and road density (200 m/ha). Strip roads were constructed in 2.0-m wide for private logging contractors and 3.5-m wide for forest owners' association. Unit strip road establishment expenses (Sawaguchi 1996) were estimated with slope angles ϑ (°).

Table 5: Cost estimation

	First thinning			Second thinning				Final felling			
	Logging residues			Timber	Logging residues			Timber	Logging residues		
System	1	2	3	1	1	2	3	1	1	2	3
Felling	X	X	X	X				X			
Processing	X	X	X	X				X			
Forwarding	X	X		X	X	X		X	X	X	
Transportation	Y	Y	Y	X	Y	Y	Y	X	Y	Y	Y
Strip road establishment	X	X		X				X			
Machine transportation	X	X		X	X			X	X		
Handling fees				X				X			

1, forest owners' association; 2, private logging contractors; 3, individual forest owners.

X, cost included; Y, cost excluded in the case of selling logging residues at landings, otherwise cost included.

$OC_R = 67e^{0.116\theta}$ in 2.0-m wide for private logging contractors (1)

$OC_R = 220e^{0.117\theta}$ in 3.5-m wide for forest owners' association (2)

Machine transportation expenses were estimated by unit costs, 5,000 yen/machine. Handling fees associated with the log market were estimated with piling costs, 700 yen/m^3 and 10% of timber prices (yen/m^3).

Revenue was estimated by the supply potential and log prices for Japanese cedar (10,000 yen/m^3), Japanese cypress (20,000 yen/m^3), and logging residue (3,000 yen/ton with 0.68 ton/m^3 at a woody biomass power generation plant and 1,000 yen/m^3 at landings). For thinning operations, subsidies are received in Japan. Subsidies were estimated using standard unit costs, areas, assessment coefficients, and the subsidy rate of the Tochigi Prefectural Government (2010). Standard unit costs were determined by ages, thinning rates, and whether or not extraction occurred (Table 6). The assessment coefficient and the subsidy rate were assumed to be 1.7 and 4/10, respectively. For the first thinning operations, standard unit costs with a thinning rate of 25% and extraction were applied. For the second thinning operations, standard unit costs with a thinning rate of 35% and extraction were applied.

Table 6: Standard unit costs for thinning operations

	Standard unit costs (yen/ha)		
Thinning rate	Less than 30%	Less than 30%	More than 30%
Age (year)	No extraction	Extraction	Extraction
26–35	83,898	400,792	600,612
36–45	70,030	381,288	571,935
46–59	63,820	386,176	579,261

For strip-road establishment, the subsidy (Table 7) was also estimated with the standard unit costs, length, assessment coefficient, and subsidy rate (Tochigi Prefectural Government 2010). The standard unit costs for strip-road establishment were determined by the average slope angle (°) and road width. After incomes were estimated, economic balances were estimated and the optimum method with the highest economic balances was examined.

Table 7: Subsidies for strip-road establishment (yen/m)

Average slope angle (°)	2.0 m	3.0 m
5	40	159
10	60	191
15	91	230
20	137	276
25	147	477
30	183	850

3.3 Results

The number and area of sub-compartments analyzed in this study, which included Japanese cedar and Japanese cypress more than 25 years old and owned by privates and local governments, were 7,268 and 2,999 ha, respectively (Table 8). These represented 89% of the total number of sub-compartments and 91% of the total area. Supply potentials of timber and logging residues were 418,895 m^3 and 254,963 m^3, respectively. Sub-compartments selected as first thinning, second thinning, and final felling operations were 23.9%, 58.3%, and 17.8% of the total analyzed area, respectively. The largest number of sub-compartments was selected for second thinning operations because forests in this region were mainly between 45 and 55 years old.

On the other hand, the number and area of profitable sub-compartments were 5,916 (81.4%) and 2,319.14 ha (77.3%), respectively (Figure 2). Available amounts of timber and logging residues were 376,490 m^3 (89.9%) and 203,875 m^3 (80.0%), respectively. Almost profitable sub-compartments were in the case of selling logging residues at a woody biomass power generation plant because the differences of logging residues prices between a plant and landings were higher than transportation expenses from almost sub-compartments.

The ratio of the number and area of profitable sub-compartments to the number and area of analyzed sub-compartments for final felling operations was higher than first and second thinning operations because of larger timber volumes. Almost profitable sub-compartments were the system 2 in the case of selling logging residues at a plant because transportation expenses of the system 2 were lower than other system. On the other hand, the system 3 was only occupied as 1.8% in the case of selling logging residues at a plant and 0.1% in the case of selling logging residues at landings because the number of sub-compartments with extracting distances below 20 m was small. In the case of selling logging residues at landings, only the system 3 was profitable because transportation expenses of the system 3 were higher than the differences of logging residues prices between a plant and landings.

Table 8: The number and area of profitable sub-compartments

	First thinning		Second thinning		Final felling		Total	
	Number	Area (ha)	Number	Area (ha)	Number	Area (ha)	Number	Area (ha)
Plant								
System 1	0 (0.0%)	0 (0.0%)	726 (16.9%)	79.89 (4.6%)	200 (14.5%)	18.67 (3.5%)	926 (12.7%)	98.56 (3.3%)
System 2	1,164 (73.4%)	456.70 (63.6%)	2,262 (52.6%)	1,225.95 (70.2%)	979 (70.8%)	481.09 (90.2%)	4,405 (60.6%)	2,163.72 (72.1%)
System 3	134 (8.5%)	13.50 (1.9%)	313 (7.3%)	31.97 (1.8%)	83 (6.0%)	6.89 (1.3%)	530 (7.3%)	52.36 (1.8%)
Subtotal	1,298 (81.9%)	470.20 (65.5%)	3,301 (76.8%)	1,337.81 (76.6%)	1,262 (91.3%)	506.63 (95.0%)	5,861 (80.6%)	2,314.64 (77.2%)
Landing								
System 1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
System 2	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
System 3	10 (0.6%)	0.79 (0.1%)	27 (0.6%)	2.47 (0.1%)	18 (1.3%)	1.24 (0.2%)	55 (0.8%)	4.50 (0.1%)
Subtotal	10 (0.6%)	0.79 (0.1%)	27 (0.6%)	2.47 (0.1%)	18 (1.3%)	1.24 (0.2%)	55 (0.8%)	4.50 (0.1%)
Total	1,308 (82.5%)	470.99 (65.6%)	3,328 (77.4%)	1,340.28 (76.7%)	1,280 (92.6%)	507.87 (95.2%)	5,916 (81.4%)	2,319.14 (77.3%)
Analyzed	1,585	718.03	4,301	1,746.93	1,382	533.60	7,268	2,998.56

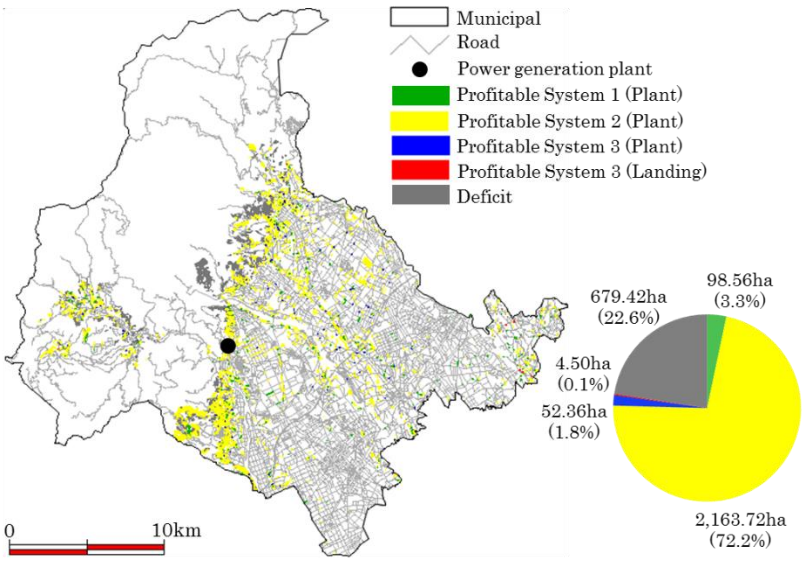

Figure 2: Economic balance

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*Approximate translations by the authors.

[PS02]

Estimating the annual supply potential and availability of timber and logging residue at aggregated stands of Takahara area, Tochigi prefecture, Japan

Ryo Uemura[1], Kazuhiro Aruga[2], and Toshiaki Tasaka[2]

1 Introduction

In the Tochigi prefecture, facilities such as biomass power plants, chip production factories, and pellet plants need woody biomass that is mainly supplied by sawmill residue and construction waste wood. However, there is concern regarding the availability of these materials because the number of entrepreneurs who have set up biomass power plants to take advantage of the actions against climate change and energy security has increased. Furthermore, in Japan, feed-in tariffs (FITs) were introduced in July 1, 2012. In an FIT, the purchase price (without tax) of electricity generated from unused materials such as the logging residue is 32 yen/kWh, that generated from general materials such as sawmill residue is 24 yen/kWh, and that generated from recycled materials such as construction waste wood is 13 yen/kWh (Agency for Natural Resources and Energy 2012). Power generated from unused materials is offered incentives. Therefore, use of logging residue will be promoted in the near future.

In order to examine availability of woody biomass resources, the annual supply potential and availability of timber and logging residue from profitable subcompartments for all the cities and towns in the Tochigi prefecture were estimated using forest management records of 2008 (Yamaguchi et al. 2013). In the study, estimations have been conducted based on subcompartments which were usual operation units in Japan. However, some forest owners' associations aggregated subcompartments, established road networks, and promoted mechanization on aggregated stands in order to improve operational efficiency and to reduce operation costs.

In this study, stands aggregated with subcompartments of Takahara area, Tochigi prefecture, Japan were investigated with subsidy applications and forest management records. Then, the annual availability of timber and logging residue on aggregated stands were estimated as the annual supply potential from profitable stands and compared with those on subcompartments.

2 Materials and Methods

2.1 Study site and Data

The study site is Takahara area in Tochigi prefecture, Japan (Figure 1). The Takahara area consists of Yaita, Shiobara, Sakura, Shioya, and Takanezawa. The gross area is 73,302 ha and forest area is 38,474 ha

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(52% of the gross area). The area of national forests is 17,318 ha, and the area of private and local government forests is 21,156 ha. This study analyzed private and local government forests with forest management records of 2008. Species in private and local government forests consists of Japanese cedar, 8,073 ha (38%), Japanese cypress, 5,552 ha (26%), other conifer, 1,519 ha (7%), broad-leaved, 5,971 ha (28%), and Bamboo, 41 ha (0.2%).

The area and number of subcompartments of private and local government forests are 21,156 ha and 49,823 (Table 1). These forests are almost 45–55 years old. The average slope angle is rather low, 13°, and the road network density is rather high, 43.7 m/ha.

In this study, we used forest registration data (stand ages, tree species, stocks, etc.), GIS data (information on roads and subcompartment layers), forest management records (locations and rate of thinning operations) and subsidy applications (locations and forest management planner) of the Tochigi Prefectural Government as well as 10-m-grid digital elevation models (DEMs) from the Geographical Survey Institute. The data obtained from the Tochigi Prefectural Government were converted into the 10-m-grid raster data for consistency with the DEM data.

Forest management records were established from subsidy records. Therefore, final felling operations without subsidy were not in the records. In this study, planting operations were assumed to occur the year after the final felling operations. Then, the subcompartments in which the final felling operations took place in 2008 were selected for planting operations with subsidies in 2009 based on the forest management records of 2009. However, subcompartments with final felling operations were not exactly same with those with planting operations next year of final felling operations. Therefore, the difference between final felling and planting operations were corrected in Yamaguchi et al. (2013).

Precommercial and commercial thinning operations as well as final felling operations were conducted on 548 subcompartments (323 ha), 941 subcompartments (448 ha) and 53 subcompartments (16 ha) of forest management records, respectively (Table 2). However, only 384 subcompartments (233 ha), 762 subcompartments (369 ha) and 22 subcompartments (8 ha) were combined with forest registration data and GIS data because of relational problem among forest registration data, GIS data and forest management records (Table 3). These differences were also corrected in Yamaguchi et al. (2013). Since forests are almost 45–55 years old, many commercial thinning operations were conducted while a little final felling operations were conducted because of low profitability of final felling operations with regeneration expenses on current Japanese forestry situation (Figure 2).

On subsidy applications, 437 subcompartments (262 ha) and 39 subcompartments (12 ha) were listed as thinning and final felling operations (Table 4). On subsidy applications, thinning methods were not on the list. Only 292 subcompartments on subsidy applications were linked with forest management records combined with forest registration data and GIS data. On subsidy applications, names of forest management planners were also listed. Subcompartments with same forest management planners on same slopes within same compartments and along same forest roads were assumed to be aggregated. As a result, these 292 subcompartments were aggregated to 114 aggregated stands. Furthermore, adjacent subcompartments which were not listed on subsidy applications but on forest management records combined with forest registration data and GIS data, were assumed to be aggregated with subcompartments on subsidy applications. As a result, 19 subcompartments (7 ha), 336 subcompartments (177 ha) and 5 subcompartments (1 ha) were aggregated to 104 aggregated stands as pre-commercial and commercial thinning operations as well as final felling operations (Table 5). The average area was increased from 0.52 ha of subcompartments to 1.79 ha of aggregated stands (Figure 3).

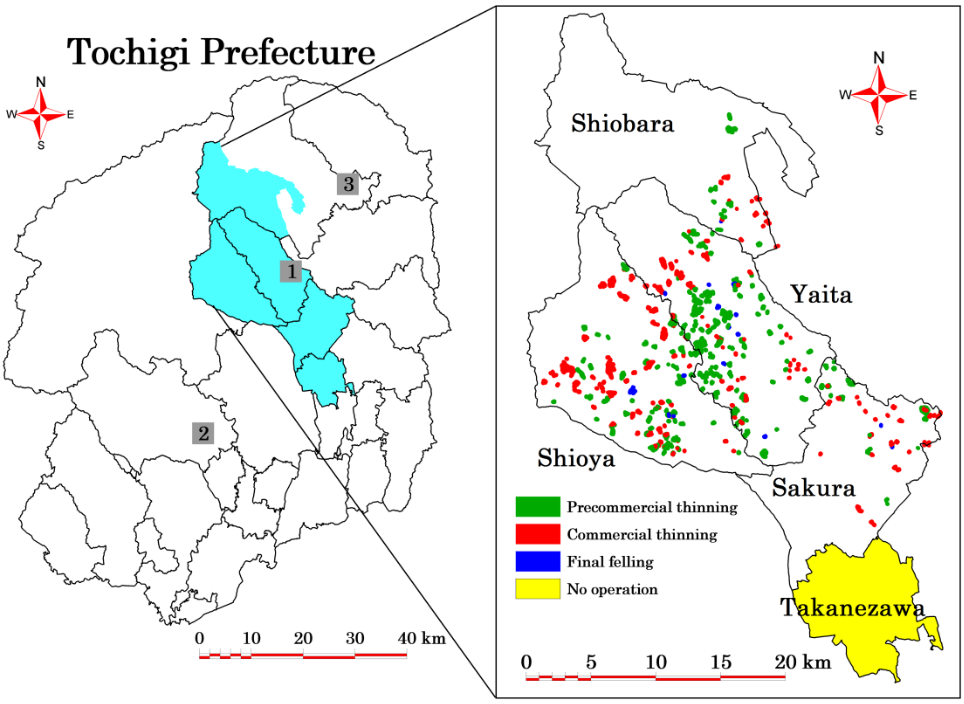

Figure 1: Distribution map of factories and log markets
(the points were magnified ten times to make them easier to see)

1	Yaita log market
2	Chip production factory in Kanuma City
3	Pellet production factory in Nasushiobara City

Table 1: Study site

	Yaita	Shiobara	Sakura	Shioya	Takanezawa	Total
Land area (ha)	17,066	19,007	12,546	17,599	7,090	73,302
Forest area (ha)	9,810	14,534	2,565	11,314	508	38,474
Forest ratio (%)	58	77	20	64	7	52
National forest (ha)	2,095	10,705	24	4,446	0	17,318
Private and local government forest (ha)	7,715	3,829	2,541	6,868	508	21,156
No. subcompartment*	18,566	7,005	8,577	13,906	1,769	49,823
Average area of subcompartment* (ha)	0.41	0.51	0.29	0.53	0.27	0.43

*Private and local government forest

Table 2: Forest management records

	Yaita		Shiobara		Sakura		Shioya		Total	
	No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	No.	Area (ha)
Precommercial thinning	113	78	32	19	118	60	285	60	548	323
Commercial thinning	469	241	42	25	134	43	296	43	941	448
Final felling	19	4	6	1	3	1	25	1	53	16
Total	601	324	80	45	225	104	606	315	1,542	787

No forest management records of Takanezawa

Table 3: Forest management records combined with forest registration data and GIS data

	Yaita		Shiobara		Sakura		Shioya		Total	
	No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	No.	Area (ha)
Precommercial thinning	68	41	22	14	54	26	240	153	384	233
Commercial thinning	391	186	32	21	87	30	252	132	762	369
Final felling	9	5	1	0.1	2	0.4	10	3	22	8
Total	468	231	55	35	143	56	502	287	1,168	610

No forest management records of Takanezawa

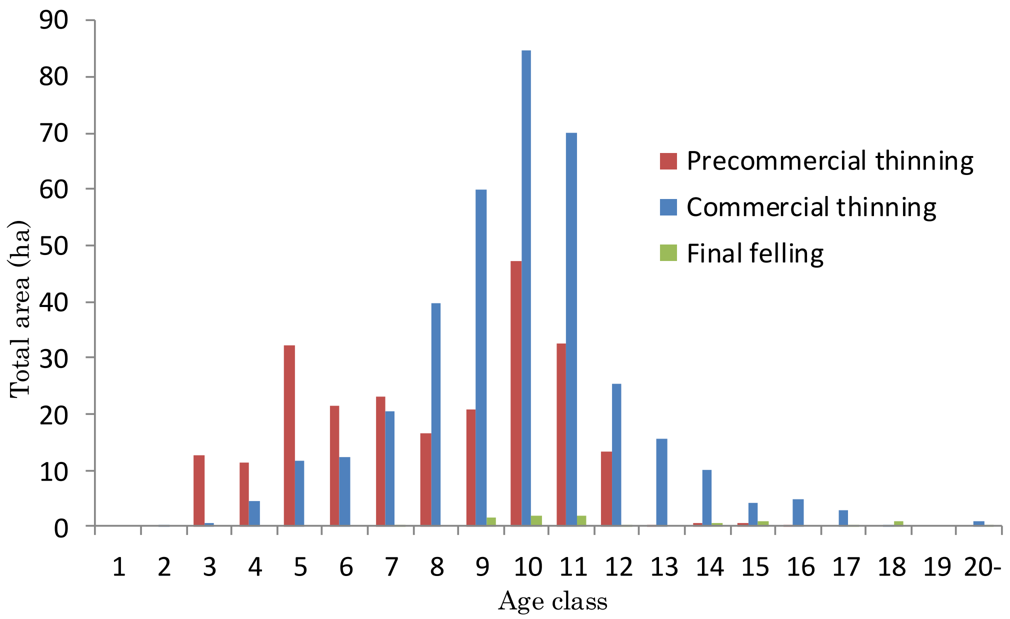

Figure 2: Frequency distribution by age class of subcompartments with precommercial and commercial thinning operations as well as final felling operations

Table 4: Subsidy applications

	Yaita		Shiobara		Shioya		Total	
	No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	No.	Area (ha)
Thinning	319	192	31	20	87	51	437	262
Final felling	36	10	0	0	3	1	39	12
Total	355	202	31	20	90	52	476	274

No subsidy applications of Sakura and Takanezawa

Table 5: Subsidy applications and forest management records combined with forest registration data and GIS data

	Yaita		Shiobara		Shioya		Total	
	No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	No.	Area (ha)
Precommercial thinning	9	3	0	0	10	5	19	7
Commercial thinning	241	120	14	10	81	47	336	177
Final felling	5	1	0	0	0	0	5	1
Total	255	124	14	10	91	52	360	186

No subsidy applications of Sakura and Takanezawa

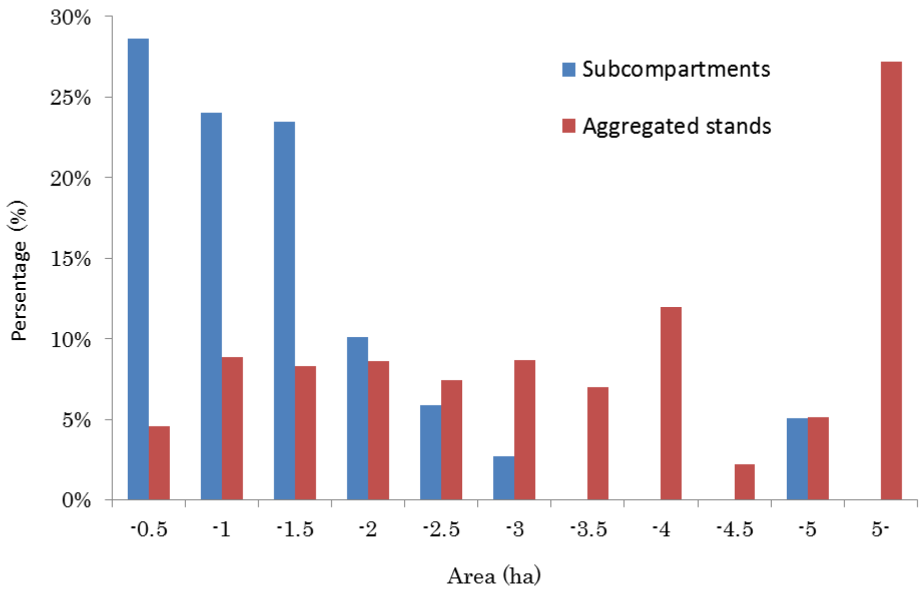

Figure 3: Frequency distribution of areas on subcompartments and aggregated stands

2.2 Methods

In this study, the annual supply potential and availability of timber and logging residue of profitable subcompartments were estimated by the following steps: 1) estimation of the annual supply potential of timber and logging residue based on cutting and extraction rates; 2) estimation of forwarding and transportation distances; 3) estimation of total expenses; 4) estimation of revenue; and 5) estimation of economic balances and availability (Yamaguchi et al. 2013).

Yaita log markets and two factories in the Tochigi prefecture were assumed to be the destination for timber and logging residue (Figure 1). Logging residues of Yaita and Shioya were transported to a chip production factory in Kanuma and those of Shiobara were transported to a pellet plant. Forest operation systems were determined on the basis of interviews with forest owners' association officials. These systems were classified into two types: (1) chainsaw felling and processing, grapple loader bunching, and forwarder forwarding; and (2) chainsaw felling, grapple loader bunching, chainsaw processing, and forwarder forwarding. Only the operations after chainsaw processing are considered in logging residue harvesting. In addition to these forest operation systems, the forest operation system of subcompartments on roads is assumed to consist only of piling by a grapple loader and transportation by a truck.

The forest operation systems of the subcompartments were selected by considering inclinations of the subcompartments based on the ratio of the area by referring to interviews with the forest owners' association officials. The forest operation systems in 30% of the subcompartments with the steepest inclinations were selected as the operation system (2). Furthermore, whole tree bunching by a grapple loader included two methods: one using a winch and the other without using a winch. The bunching method was also determined from inclinations of the subcompartments by referring to the interviews with forest owners' association officials. The forest operation systems in 20% of the subcompartments with the steepest inclinations used a winch. As a result, whole tree bunching with a winch were selected more than 20.9 degrees of slope angle, whole tree bunching without a winch were selected between 18.6 and 20.9 degrees of slope angle, and Cut-to-length bunching were selected less than 18.6 degrees of slope angle.

Revenue was estimated by the supply potential and log prices for Japanese cedar and others (10,000 yen/m^3), Japanese cypress (20,000 yen/m^3), and logging residue (3,000 yen/ton). After estimating the economic balances from revenue and costs, production forests were extracted as profitable subcompartments. Then, the availability of annual timber and logging residues was estimated by the supply potential from the profitable subcompartments.

3 Results and discussions

3.1 Supply potential and availability

Supply potential of timber and logging residue was 6,852 m^3 and 5,837 tons, of which 1% (47 m^3) and 6% (354 tons) were from precommercial thinning operations, 93% (6,376 m^3) and 92% (5,363 tons) were from commercial thinning operations, and 6% (430 m^3) and 4% (120 tons) were from final felling operations, respectively (Table 6 and 7).

Operation costs were reduced from 12,810 yen/m^3 of subcompartments to 11,177 yen/m^3 of aggregated stands (Table 8 and 9). Especially, operation costs of timber were reduced from 19,155 yen/m^3 of subcompartments to 15,293 yen/m^3 of aggregated stands significantly because of decreasing indirect costs such as machine transportation expenses and landing establishment costs while operation costs of logging residues were increased from 11,255 yen/ton of subcompartments to 11,409 yen/ton of aggregated stands a little because of operation systems. Therefore, the annual availability of timber was increased from 1,270 m^3/year of subcompartments to 1,295 m^3/year of aggregated stands whereas the annual availability of logging residue were same as 94 ton/year between subcompartments and aggregated stands (Table 6 and 7).

Operation costs of logging residues were higher than revenues of logging residues. Therefore, profitable subcompartments and aggregated stands with logging residues harvesting were all Japanese cypress stands with high prices (Table 8 and 9).

Table 6: Supply potentials and availability of subcompartments

			Timber		Logging residues	
	No.	Area (ha)	Potential (m^3/year)	Availability (m^3/year)	Potential (ton/year)	Availability (ton/year)
1	331	158	5,583	-	5,010	-
2	26	25	1,150	1,150	734	-
3	3	3	119	119	94	94
Total	360	186	6,852	1,270	5,837	94

1: deficient, 2: only timber profitable, and 3: timber and logging residues profitable

Table 7: Supply potentials and availability of aggregated stands

			Timber		Logging residues	
	No.	Area (ha)	Potential (m^3/year)	Availability (m^3/year)	Potential (ton/year)	Availability (ton/year)
1	84	155	5,557	-	4,983	-
2	17	28	1,176	1,176	761	-
3	3	3	119	119	94	94
Total	104	186	6,852	1,295	5,837	94

1: deficient, 2: only timber profitable, and 3: timber and logging residues profitable

Table 8: Economic balances of subcompartments

	Timber (yen/m^3)			Logging residues (yen/ton)			Total (yen/m^3)		
	Revenues	Cost	Balance	Revenus	Cost	Balance	Revenus	Cost	Balance
1	11,255	20,441	-9,186	3,000	11,184	-8,184	6,013	13,203	-7,190
2	15,468	13,587	1,881	3,000	11,487	-8,487	8,968	10,840	-1,871
3	20,000	12,684	7,316	3,000	11,344	-8,344	10,387	10,110	227
Average	12,115	19,155	-7,040	3,000	11,255	-8,255	6,512	12,810	-6,298

1: deficient, 2: only timber profitable, and 3: timber and logging residues profitable

Table 9: Economic balances of aggregated stands

	Timber (yen/m^3)			Logging residues (yen/ton)			Total (yen/m^3)		
	Revenues	Cost	Balance	Revenus	Cost	Balance	Revenus	Cost	Balance
1	11,285	15,819	-4,534	3,000	11,397	-8,397	6,027	11,308	-5,281
2	15,238	13,065	2,173	3,000	11,498	-8,498	8,804	10,562	-1,758
3	20,000	12,730	7,270	3,000	11,344	-8,344	10,387	10,131	256
Average	12,115	15,293	-3,178	3,000	11,409	-8,409	6,512	11,177	-4,665

1: deficient, 2: only timber profitable, and 3: timber and logging residues profitable

3.2 Verification

Verification was conducted on commercial thinning operation of 5.75-ha Japanese cedar and cypress stands aggregated with 12 subcompartments (Figure 4). Forest ages were between 41 and 64 years old. Stand density was between 1,000 and 2,600 stems/ha and stem volume was between 0.32 and 1.69 m^3/stem. Thinning rate of stems was between 25 and 42 %. Slope angle was 17 degrees and road density was 336 m/ha. Estimated production volume, 213.7 m^3 was similar to actual production volume, 211.5 m^3. Furthermore, estimated operation costs of timber, 15,852 yen/m^3 of aggregated stands were closer to actual operation costs, 9,712 yen/m^3 than those of subcompartmetnts, 24,818 yen/m^3.

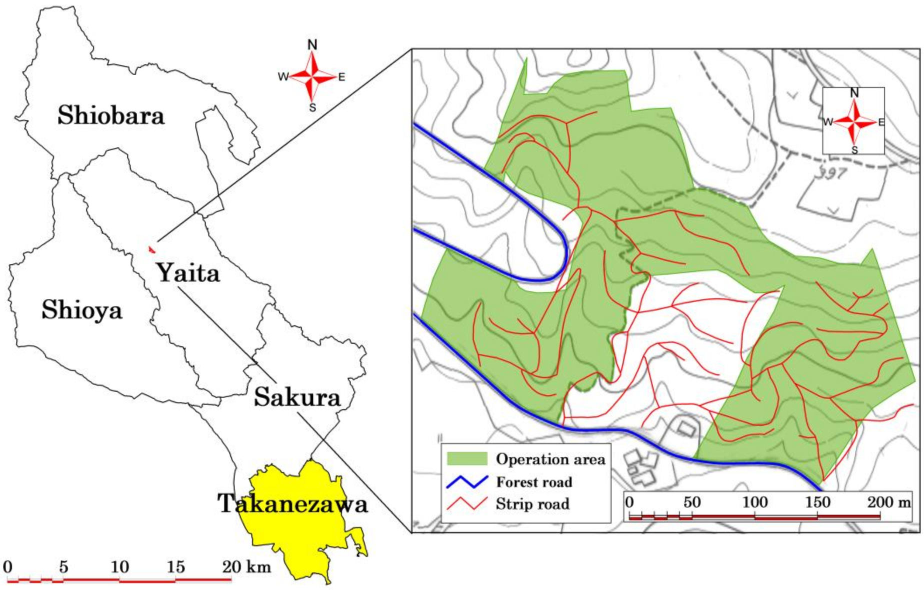

Figure 4: Verification sites

3.3 Program for aggregating adjacent subcompartments

The program aggregated adjacent subcompartments on subsidy applications as well as subcompartments which were not listed on subsidy applications but on forest management records. As a result, 18 subcompartments (7 ha), 346 subcompartments (185 ha) and 2 subcompartments (2 ha) were aggregated to 120 aggregated stands as pre-commercial and commercial thinning operations as well as final felling operations. The number of stands was increased from 104 stands by manual to 120 stands by program because by manual, not contacted subcompartments with same forest management planners on same slopes within same compartments and along same forest roads were aggregated while the program aggregated only adjacent subcompartments. Therefore, the average area was decreased a little from 1.79 ha by manual to 1.62 ha by the program. However, operation cost by the program, 11,163 yen/m^3 was similar to that by manual, 11,177 yen/m^3. The annual availability of timber and logging residue estimated by the program, 1,408 m^3/year and 119 ton/year were also similar to those of actual aggregated stands, 1,295 m^3/year and 94 ton/year.

4 Conclusions

In this study, stands aggregated with subcompartments of Takahara area, Tochigi prefecture, Japan were investigated with subsidy applications and forest management records. Then, the annual availability of timber and logging residue on aggregated stands were estimated as the annual supply potential from profitable stands and compared with those on subcompartments. As a result, operation costs were reduced and the annual availability of timber was increased from subcompartments to aggregated stands whereas the annual availability of logging residues was the same. Furthermore, estimated operation costs of timber on aggregated stands were closer to actual operation costs. Then, the program to aggregate neighboring sub-compartments was developed. As a result, the number and areas of stands aggregated by the program were similar to those of actual aggregated stands. Therefore, operation costs and the annual availability of timber and logging residue estimated by the program were also similar to those of actual aggregated stands.

However, this study analyzed only an area managed by a forest owners' association and verified only a site operated by the same forest owners' association on single year of forest management records and subsidy applications. Therefore, the next study should analyze and verify other areas and sites on multiple years of forest management records and subsidy applications. Moreover, estimation of the supply potential of timber and logging residue in each subcompartment was based on a fixed extraction rate, timber rate, and logging residue rate for precommercial and commercial thinning operations as well as final felling operations. However, the rates and silvicultural prescription were different from site to site. Furthermore, log prices differed as a function of log quality. Therefore, silvicultural prescriptions, rates, and log prices should be determined on the basis of actual regional conditions to improve the estimations of annual supply potential and availability.

The subsidy was received on thinning operations and an important factor of profitability. However, this study did not consider subsidy. Furthermore, in Japan, feed-in tariffs (FITs) were introduced in July 1, 2012 and a price of logging residues was expected to about 10,000 yen/ton (Japanese Forestry Investigation Committee 2011). Therefore, the next study should also consider the subsidy and different prices of logging residues.

Acknowledgements

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*Approximate translations by the authors.

[PS03]

Management of forests open to the public for educational use

Case Study of the Tama Forest Science Garden

Mariko INOUE[1] and Yasuhiko OISHI[1]

1 Introduction

To realize a sustainable society, the promotion of ESD (education for sustainable development) and environmental education are demanded. The United Nations designated the decade for ESD in 2002, the plan for which has been implemented by UNESCO since 2005 (UNESCO 2013). Using forests wisely is crucial to realize a sustainable society, because they provide various natural resources and biodiversity. Accordingly, a wider awareness of forests would be important to ensure that they are used wisely and conserved.

In Japan, education on awareness of forests has spread and “Forest environmental education” was proposed by the forestry council in 1999. “Forest environmental education” means knowing about forests and various forest functions through experience within forests. Under the Forest and Forestry basic act enacted in 2001, promoting the use of forests for education to enhance public understanding and awareness of forests and forestry was defined (Forestry Agency 2001). In its annual report on forest and forestry trends, it reported “The plan sets forth the further promotion of administration to sustain and develop public functions, the active roles of the National Forest in taking in the initiatives on new policy issues such as mitigating global warming, and the full-fledged promotion of forest environment education and public participation in creating forests” (Forestry Agency 2004).

The scope of the forest area for educational use has widened, and many volunteer activities in forests have been performed. Publicly accessible forests have been established for use, some of which with information centers. For many people, the opportunity to go to forests has increased. These people, including teachers and children, may need paths or rest areas inside the forests. Some teachers would request information about the forest, for example “What kinds of trees are there?” or “Is there any dangerous area or living things?” Furthermore, activities inside forests would have an impact on the forest itself. If forest areas are used for education, some kinds of maintenance or treatment is needed, which would come within the scope of forest management. Now however, the best way of managing forests for educational use remains unclear.

In this study, forest management for educational use was analyzed through a case study of the Tama forest science garden, which has been open to the public since 1991. The area open to the public in this garden is 15 ha, including arbors and a pavilion.

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2 Methods

2.1 What are “forests for educational use”, and how are these forests managed?

Initially, this study defined the scope of about the forest area for educational use, i.e. “forests for educational use”. The number of forest areas considered feasible to use for education was determined by an annual report on trends in forests and forestry and so on. According to proceeding reports, we cleared the characteristic of “forests for educational use”, whereupon we defied this research subject on “forests for educational use” and analytical perspectives concerning the management of “forests for educational use”.

2.2 A case study of management of “forests for educational use” in the Tama forest science garden

To know how to manage “forests for educational use”, a case study of the Tama forest science garden was analyzed. Bibliographical sources such as annual reports were researched to determine the service and work in this garden to open forests. The focus when analyzing the management of “forests for educational use” was on maintaining the forests and facilities in the field, while management for users included maintaining safety and educational activities.

2.3 Management of “forests for educational use”

To utilize these results, management for “forests for educational use” would be examined.

3 What are “forests for educational use”, and what is management of these forests?

3.1 The present situation of “forests for educational use”

Forests areas considered feasible to use for educational purpose were collected and four kinds of forest area were subsequently designated; two of which in National Forests.

Educational forests for natural observation, named “Shizen kansatu kyouiku rin” in national forests: 165 areas (in 2011) (Forestry Agency 2012).

National forest exchanged with schools concerning educational use, named “Yu-Yu no mori”: 172 areas (in 2010) (Forestry Agency 2012).

School forest: 3,057 areas (in 2006) (Okuyama 2013).

Facilities include fields for use for experience activity by children, named “Morinoko kurabu”: 421 areas (in 2011), which involved a political measure by coordinating with the Ministry of Agriculture, Forestry and Fisheries of Japan and the Ministry of Education, Culture, Sports, Science and Technology (forestry agency 2011).

Excluding any overlap, the total numbers of these areas were 3,815. In addition, there would be other kinds of “forests for educational use” set by prefectures or municipalities.

3.2 The type of "forests for educational use"

Inoue and Oishi (2011) reported that there were three kinds of forest type for nature experiences in forests for forest education, based on a fact-finding survey.

Use-type (a) "open areas" publicly accessible such as national parks

Use-type (b) "closed areas" with restricted use such as school forests

Use-type (c) specially designated facilities such as camp sites

We tried to apply the "forests for educational use" criterion to these three types. "Shizen kansatu kyouiku rin" would fit in use-type (a). In these areas, trails and certain signs were provided. Anyone is freely allowing enter, hike and observe, but not allowing pick or cut any trees. Use-type (b) was allowed for restricted users such as designated schools, meaning "Yu-Yu no mori" and school forests would fit in use-type (b). Finally, some kind of "Morinoko kurabu" such as forest parks would fit in use-type (c). Consequently, despite the many forests in Japan, but not all can be used for education.

In forests use-type (b), any activities were allowed, including those with a direct impact on forests, for example cutting trees and collecting natural products (Inoue and Oishi 2011). The number of such use-type (b) forests was estimated at 3, 229 (i.e. adding number of "Yu-Yu no mori" and school forests). The number of schools is ten times larger than that; the number of elementary schools is 21,460 and that of junior high schools is 10,699 (the Ministry of Education, Culture, Sports, Science and Technology 2012). This type of forest was not common for schools.

Conversely, forests of use-types (a) and (c) were open to use for all people, including any schools or groups. These forests are deemed to be controlled by owners and usually include some information signs with information about the forests. Forests of use-type(c) in particular may include pavilions or exhibition space to offer information on forests and nature for users. Sometimes, guided tours or lecture events to educate people on forests are also held.

3.3 Point of analysis of management "forests for educational use"

The conditions for forest education included four kinds of contents: forests allowing educational use, educational programs, leaders or guides, and learners (Oishi 1998). It would help users if forests meeting these conditions and open to the public would include any kind of information or field sign to educate people on forests, and guides were stationed in the area. Some kind of forests of use-type (c) area would meet these criteria.

In this study, this research subject of "forests for educational use" was use-type(C), namely those open to the public, with pavilions, and holding some kind of activities related to education about forests. Such forests also resembled recreational forests. Furthermore, the fact that they held activities related to education resembled museum faculties as social education facilities. In this study therefore, the criteria we imposed for analytical management of "forests for educational use" included maintaining forests as from a forest management perspective, maintaining facilities in the field and control over users from a perspective of recreational forests management, and holding educational activities and providing information from the perspective of social education. We analyzed the management of "forests for educational use", which was defined as "forests open to the public under management, and provided some kind of educational programs or information about forests."

4 A case study of management of "forests for educational use" in the Tama forest science garden

To know how to manage "forests for educational use", a case study of the Tama forest science garden was analyzed.

4.1 A general outline of the management in the Tama forest science garden

4.1.1 A general outline of the Tama forest science garden

The Tama forest science garden is a branch of the Forest and Forests Products Research Institute, the only national institution about forests. This garden is located in Hachioji, in the western area of Tokyo and near mountains and Mt. Takao, a famous sightseeing area, just only 10 minutes from Takao station. This garden was initially established as an institute about forestry for the Imperial estate. The ground area covered is 56 hectares, with experimental forests including natural forests, artificial forests and cherry garden conserving forms of the Japanese flowering cherry planted since 1966.

The Tama forest science garden has been opened to the public since 1991 (admission charged since 1992). The area open to the public is 15 ha, including arbors of domestic, exotic and conserved cherry trees, secondary natural forests, and a pavilion. The arbors include a strolling trail, about two kilometers in total, and which takes about two hours to walk round, while the elevation ranges from 183 meter to 287 meters. There are three toilet facilities, an arbor, a rest area, many benches, and several kinds of signboards. The pavilion is a two- story building made of several kind of wood, and the gross area is 914 square meters.

The Tama forest science garden is open all year round, excluding Mondays (without a holiday) and the year-end and New Year holiday period. The yearly average number of users was about 68 thousand (from 1992 to 2012). Over 60 percent visited in April, during the cherry blossom season.

This garden has been closed twice due to natural disasters. The first time was torrential rainfall on 28 September, 2008, following which the garden was closed until January 2009 for work to restore the walkways. The second was torrential rainfall on 21 September, 2011, whereupon it was closed until the following month.

4.1.2 The history and background leading up to "the forests for environmental education"

The history of the garden being open to the public was divided four periods (Inoue and Oishi 2013).

The first period (from 1991 to 1995): at the beginning and making up the system

There were three reasons why this institute was opened to the public (Inoue et al. 2010).

1) Reorganization of the Forestry and Forest Product Research Institute in 1988. Since then, the Tama forest science garden added a new purpose related to propagation to the results of forest research, as well as research about forests.
2) Increase in recreational needs for forests from urban residents. The 1980s saw increased recreational needs, especially from urban residents, as well as an increasing focus on environmental problems. Moreover, cherry trees gradually grew and made the garden increasingly attractive.
3) Social service by effectively exploiting the experimental field. This experimental field was used for inspection or investigation. As the cherry trees in the garden gradually grew, cherry garden was opened for viewing in April as a social amenity. Many people visited this garden, hence the must accommodate users to be at one with forests.

During this period, walkways in botanical garden, and a pavilion and exhibition were established. After opening, guided tours and holding lectures also got underway. A system of works for reception and so on was established as entrustment.

Second period (from 1996 to 2000): improvement to the garden was started

The number of users peaked in 1994, whereupon certain improvement activities or special exhibitions got underway.

Third period (from 2001 to 2005): targeted “the forests for environmental education”

The Tama forest science garden was intended as a “the forest for environmental education” since 2002, and research related to education on forests and the environment got underway. Guidebooks for this garden were also published.

Fourth period (from 2006 to date): at the present time

Casting to oversee publicity and exhibition was decided, and several types of activities for education were launched. The aims of the garden were focused in the form of three points:

1) As the institute for forests; this garden includes examination forests, including natural forests in urban areas, and forest conservation is basically considered worthwhile based on scientific opinion.
2) Prepare for a field to allow urban residents to be at one with the forest as a social amenity in the institute.
3) The basis to education people on forests, basically with knowledge of forest science and propagation of the results of forest research, too.

4.2 Contents to do for management “forests for environmental education”

The present circumstances of management of “forests for educational use” in the Tama forest science garden were analyzed through four kind perspectives; maintaining forests for arboretums, maintaining facilities in the field, user’s control, and holding educational activities and providing information from a social education perspective.

4.2.1 Forest management for arboretums

There were 15 hectares of forests as botanical gardens. Maintaining these forests mainly involved brushing, felling dying trees, and maintaining walkways and roads. Forest researchers have performed monitoring trees, animals and birds in the forest. The garden faced two problems: trees which were too large to allow the leaves to be observed, and for the purpose and methods of forest management. Adaptive management with biological diversity in mind was targeted.

4.2.2 Maintenance of facilities in the field

There were walkways, toilet facilities, an arbor, many benches and several kinds of guideboards. Cleaning of facilities and patrolling the garden to ensure safe use were preformed daily or weekly. The walkways and several facilities were maintained each year. A shelter from torrential rain and lighting was erected in 2012, while in 2013 the benches in the field were refurbished.

4.2.3 User control

In the garden, daily work involving users includes selling admission tickets, counting the number of users, ensuring safety control, making several kinds of announcement, and receiving telephone inquiries. Emergency work may also apply when the weather changes, or also involve calling an ambulance.

4.2.4 Holding educational activities to provide information

Two types of activities were held for education in the Tama forest science garden. The first involved providing information and the second, holding several activities.

Providing information included making and showing exhibition or information boards in the pavilion or in the field, and providing guidebooks or small leaflets for learning in the garden. There was a guide map including some information for observation. Uses could view and observe in the garden and a pavilion showing these prints by themselves. In 2012, new information boards on trees were set up, corresponding to the new plant taxonomy.

The activities held included lectures or symposiums in a room (10 times or more a year), guided tours of the garden held every weekday (taking about two hours), and experience activities. For schools, conducted tours were held on an as-requested basis. In 2012, three kinds of events for educational purposes were held by forests researchers. One was for high school students and the remaining two were for adults, and they included experience activities.

5 Conclusions

During this study, forest management for educational use was analyzed by conducting a case study of the Tama forest science garden.

We defined “forests for educational use” as “forests open to the public under management, and providing some kind of educational programs or information about forests.” According to proceeding reports, the category of “forests for educational use” included three types of forests. When examining forests open to the public which provide some kinds of activities, work on managing “forests for educational use” included four kinds of aspects, i.e. 1) maintaining forests, including monitoring, surveys and operations, 2) maintaining facilities for user convenience, such as benches and toilet facilities, 3) maintaining user safety by counting numbers, providing information on hazards and emergency countermeasures, and 4) managing and providing educational activities, including map-making, leading in the garden and lecture meetings.

The result show two points revealed when using forests for education. Firstly, despite the many forests in Japan, not all forests could are suitable for educational use. User safety and convenience such as walkways and information boards, and information about forests are needed. Secondly, holding educational activities involves providing some kind of educational programs or information about forests. Forest management for educational use resembled recreational use, but the need for educational programs or information can be considered a difference.

Two further points concerning future analysis of management as “forests for educational use”. The initial problems concern management of the forest. We must analyze “What type of forests would be better for educational use”, and the “Impacts on forests of activities”. In this case, only walking along walkways is allowed. However, in other areas, for example school forests, activities would be held inside forests. We should analyze other types of case study. Secondly, during this study, we showed two types of educational activities, i.e. providing information and holding lectures and events. However, we did not analyze the contents and purpose of educational activities. We should target and consider effective educational activities. We must educational use of purposes (why), contents (what), targets (whom) and methods (how).

Management of “forests for educational use” is a new topic. Based on this paper, various perspectives are needed to analyze the educational use of forest. We should continue analyzing other types of case studies, and target the establishment of management systems for educational use in forests.

Acknowledgements

We thank all staff of the Tama forest science garden, especially Dr. Fujii, Tomoyuki and Dr. Akama, Norio, successive directors of the garden, and Dr. Yoshimaru, Hiroshi, the director of the garden, for their coordinate and offer of the research data of this study.

This study includes the contents of next paper (INOUE, Mariko and OISHI, Yasuhiko (in contributing). Journal of forest planning and the Journal of the Japan association of botanical gardens)

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[PS04]

Multiple Forest Management Strategies in Morotomi Forestry, Fukuoka, Japan

Mitsunobu Morotomi[1], Opoku Boamah Neil Campbell and Takayoshi Sato[2]

1 Introduction

Distinguished forest management strategies are necessary especially under declining log price condition. The strateries should be effecient use of limited facilities and labor, and effective time and places with long time aspects. The study focuses on relation between producers and consumers. Basically these are three types of relations; first sellers or producers making maket condition (a log producer is able to decide wood prices), second buyers or consumers making market condition (constructors or sometime saw millers are able to decide wood prices) and third sellers and buyers are negociate to decide the wood prices. When forest resources are limited in the area, price of logs are increased under competition of consumers. In this case, if sellers produce a lot of good quality of logs, inceasing of benefits were promised automatically such as before 1980's. However, in case of forest resoruces are existing as now, buyer's market which decides low-priced of logs even if good qualities. So management strategies might be efficient produce popular goods for matching demands, or to find and to produce sellers market goods.

This study refers to Morotomi industry promotion in forest products (Morotomi Forestry; M forsetry) locats Yame City, Fukuoka Pref., due to the company manages wide area of forest, a lot of businesses are deal with especially producing strain houses together with contructor companies.

Objectives of the study are how to create forest management strateries especially low priced log condition. Basic problems of the study are"what are the conditions of seller market goods?", "how much of demands of sellers market goods?") and "how to produce with market needs efficientry?"

2 Methodology

Status of Morotomi forestry, and quality and quantity of sellers maket demands are researched basically interview of related companies such as a log market, sawmillers, pre-cut company, and construction company. Based on the results, Morotomi forestry management strategies are proposed by multiple aspects, such as forestry for sellers maket, and buyers maket strategies. Especially strategies of sumiration was focuses on number of seedling, thinning and rotation period. And the results extended to zoing of each forestry was proposed.

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3 Morotomi forestry and relevant companies

3.1 Characteristics of M forestry

M forestry is located in Yame City and the factory is in Yabe Village. M forestry consists on several business related on forestry, such as silviculture, sawmill, pulp and chip with biomass utilization, etc. And the products of sawed wood supply for individual houses, temple and shrines, public facilities, etc. M forestry owned more than 300ha of forest land in Fukuoka Pref. Concepts of M forestry are basically producing good quality of logs with long time rotation, and contribution to community. So the forest have been treated politeness ways of planting, weeding, pruning, and thinning. Recently special treatments are excuting a harvesting during crescent moon (shingetsu-bassai) and drying with leaf at mountain site (hagarashi-kansou). Processing logs have been executing draw out advantage of natural goods with single bound saw, natural drying, and shipping with molder and planar.

3.2 Distribution of M forestry logs

There are several types of logs distribution which the products utilize efficiency found at M forestry. Mainly these are classified three types; 1) special products disutribution are related up to consumers (SP), 2) general products distribution up to logs market (GP), and 3) other products distribution (OP). Logs are distributing depends on demands and quality of products.

Table 1 shows the distribution of M forestry. Two types of SP found that; one is market for Yame and Kurume regions (SP1), and another is market for Hakata regions (SP2). SP1 distribution lumbers are supplied from M forestry through M sawmill (sawmill), Nishi-nihon craft (pre-cut), Ishinaga architecture studio (building contractor) to consummers. Nishi-nihon craft; is a pre-cut company process 10,000 to 15,000 m^2 area of house in a year, using mainly domestic logs such as sugi, and hinoki. Ishinaga architecture studio is a building contractors; using only lumbers of M forestry, 2 to 3 houses are creating with communication with consumers, which supplies lumber of 40-80m^3/yr. Ishinaga architecture studio considered environment priorities, using only domestic wood, traditional way of construction with less metal goods. Some consumerswith sick house and allergy could be found.

SP2 distribution lumbers are supplied from M forestry through Yame sawmill (sawmill), Harada wood (pre-cut), and Best Home (building contractor), to consumers. Yame sawmill; organized with 8 companies in 1996 under government assistance. Main activities are sawmill and drying. Harada wood; is a pre-cut company mainly using sugi and hinoki lumbers 8,000 to 11,000 m^2 of house in a year. Best home; a building contractor locates Hakata City. Health materials, communicate with consumers are policy of the business. Numbers of housing about 8 in a year, meaning using lumber around 140-180m^3/yr. M forestry was introduced by Ishinaga architecture studio.

GP distribution through Yame logs market, so flows of logs are depends on sawmill company and the flows is not conform up to consummers. Yame log market; constructed for efficient supplyment of log in the area in 1961. The market created with three forest cooperatives. At the beginning, electric post were main demands and market was opened twice a month. The market treats around 20,000 m3 logs in a year.

According to the manager of the market, logs for post (3m long and 18-20cm diameter) and logs for crossbeam (4m long and 24-30cm diameter) are popular demands and easy to distribute.

OP refers to low materials such as plup and chip for biomass energy, and small post for road construction. Biomass plants required stable supply which contract with city facilities. A chip factory is involved M forestry in 2009. Small post using top part of stands and process by forest cooperative factory.

Table 1 Distribution of Morotomi forestry products

silviculture	Logging	log market	Process	Pre-cut	Contractor	kinds of products	flow
M forestry	M forestry	-	Y sawmill	H pre-cut	B home	house structure	SP1
		-	M sawmill	N pre-cut	I home	house strucutre	SP2
		Y market				house structure	GP
		-	M factory			biomass energy	OP1
		-	forest cooperative			post	OP2

4 Forest management Strategies of Morotomi forestry

The way of decisions of log price were depended on log distribution such as SP, GP and OP. Forest management strategies considered by distribution are as follows:

SP strategies; should be considered good quality, large size, special treatment, consumers visit the area. Prices of logs decided by forest owners and buyers decide the stands. So good site quality and location are necessary. Prices might be decided by cost of planting, treatment, logging, processing, company benefits and social cost (guide and information data) and decreasing subsidy, and thinning benefit. Thinning is necessary for selection of good quality. Harvest of stands depended on consumers and demands.

GP starategies; focuses on logs produce only case of beneficially, due to much demand of post and cross beam, main harvesting should be 30 year for post and 60 years for crossbeam. Location and quality of site is better area. However the GP area is only case of beneficially compared with market price, subsidy, and of planting, treatment and loging. For decreasing of planting and treatment, big stump and less number of seedlings are considered, and logging road and machinery should also considered for decreasing logging cost. In case of not enough labors, request subcontractors applied.

OP strategies; is not special, due to harvesting and thinning of SP and GP are able to apply OP. In case of scare the products, good relation with other sawmills companies are important. Forest except SP and GP are proposed that long time rotation for environmental roles, or creating natural forest is recommendable, which remain only good seedling or low cost planting as possible.

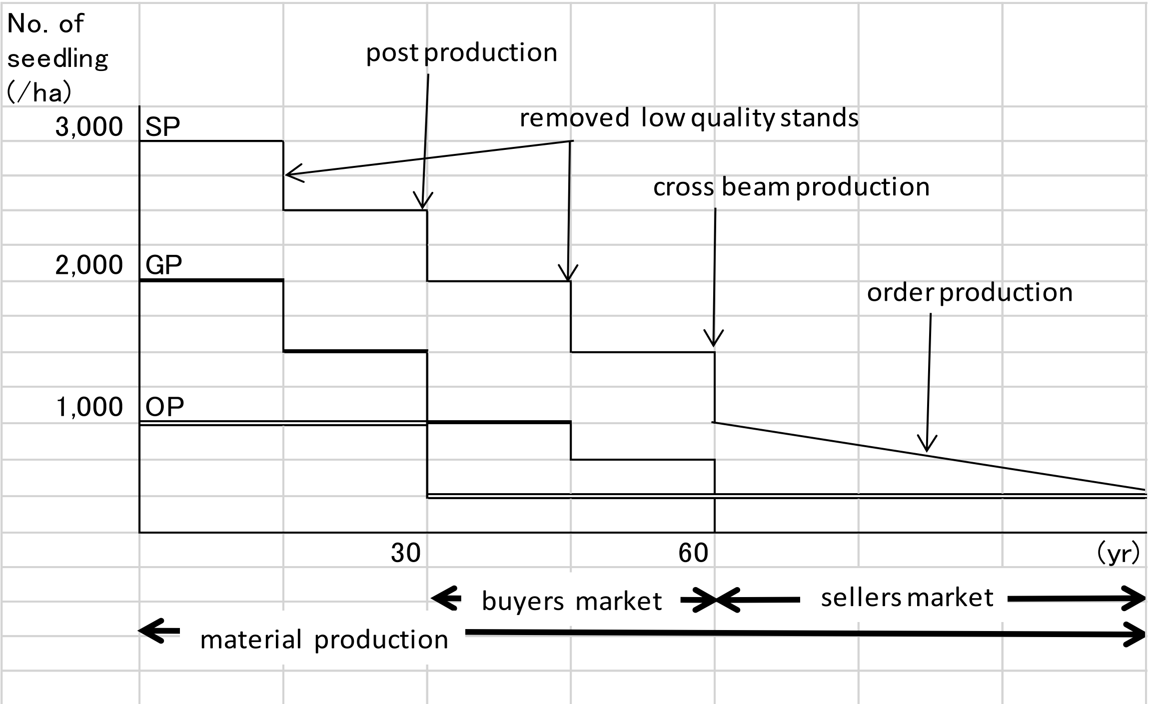

Fig. 1 Images of Morotomi forestry strategies

5 Recommendation

As the results, location of forest depended on strategies are SP for good condition, and GP for beneficial condition, and OP for environment concerned. So between SP and GP is decided by quantity of SP which sellers market, and between GP and OP is decided by benefit of logs production, which buyers' market.

Sellers market logs should be considered, a) demands of consumers, b) labors power and technologies, socialization to consumers, c) area of SP is able to supply. In recently, due to less demands of SP, a) is a criteria of SP strategy. Buyers market loges should be considered, d) cost of loggin, e) cost of planting and treatment, and f) price of logs. Due to decreasing of c), a) and b) should be considered.

In summary, due to forestry is a long time concerns, basic way of forest management should not be changed, however, when declining of log prices, strategies is necessary especially, consider with characteristics of manager and area.

Acknowledgement

We wish to extend thanks for cooperation of the research, good comments and suggestion as follows; Yame log market, Yame industry, Nishi-nihon craft, Harada wood, Best home, Ishinaga Studio, and all which related to the paper.

[PS05]

A Family Approach to Small-scale Forest Management

Incorporating Exchange Activities

Takayoshi Sato[1], Kenjiro Asano[1] and Kiyoko Hoshino[2]

1 Introduction

Forest management and utilization is changing in disparate ways including via the impact of economic change on rural communities. And an increased efficiency and effectiveness of production systems that seem to be better utilize forest resources. However aside from enhanced production systems, constraints on profitability brought exclusion of a lot of rural community use. When log prices decline, forest resources tend to be considered unimportant for local business. As a result, in addition to a decrease in the population of young people, environmental degradation in forests has been identified.

This study considers social architectures by which to enhance rural life; and those that are conducive to fostering good forest utilization and environmental management. A focus is on encouraging young people to stay in rural area, or become involved in forestry in rural communities. A central thesis is that exchange activities that engage people from outside rural and rural communities and people within rural communities are conducive to invigorating those rural communities.

The study incorporates the activities of WWOOF Japan (World Wide Opportunities on Organic Farms, <www.wwoofjapan.com>). WWOOF started 1971 in the UK, and has since grown to be represented by independent WWOOF organizations in more than 50 countries. In Japan there are approximately 400 Hosts. The main activities undertaken by WWOOF Japan Hosts (called 'Hosts') are centered on organic farming.

At present there are only a few Hosts involved in forestry. Because forestry work is tend to be considered technically, physically and in terms of safety difficult. However becauses forestry is fundamentally associated with agriculture, the environment and rural life, there is good potential for more forest utilization for Hosts. So a hypothesis of the study is that; if economic profitability is not significant criteria of forest utilization – as is the case considering WWOOF activities – there is much potential for forestry to be used rural communities.

2 WWOOF and forest utilization

2.1 System of WWOOF activities

WWOOF system is simple; individuals (called 'WWOOFers') join WWOOF Japan in order to be able to contact Hosts of their liking, make friends with those Hosts by corresponding with them, and to then go and

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visit them. Hosts provide WWOOFers with accommodation, meals and learning as a member of their family, in return for WWOOFers helping the Host with the activities done at the Host's place. That can include, for example, typical daily goings-on such as cooking meals and helping around the house. No money at all is exchanged between Hosts and WWOOFers.

The WWOOF Japan office maintains a liberal view concerning the criteria of organic farming. Generally, that Hosts be involved with enhancing natural environments, adopting sustainable life styles, recycling, heoping others, local production of foodstuffs, adoption of permaculture concepts, etc. The relation between a HOST and a WWOOFer includes mutual support with matters technical, social, cultural, language, and education. Rules of participation activities at Hosts' places are basically six hours a day, and rest a day once a week.

2.2 Characteristics of WWOOF Japan and Forest utilization

WWOOF associations in the world are entirely independent on other countries, so systems and rules are exclusively a matter for each individual country. According to number of Hosts in countries, Australia has largest number of Hosts (2,200), followed in order US, New Zealand, Canada, France, UK, Italy, Japan, etc. In Japan, the most numbers in any one region is Hokkaido (74 host or 18.1%), Nagano, Okinawa, Kumamoto, etc. And there are Hosts in all prefectures throughout Japan. The main activities engaged in by Hosts include general agriculture (243 Hosts 52.3%), agriculture focusing on vegetables (192 Hosts, 47.3%), accommodation (123), food processing (87), restaurant (85), agriculture main in rice (80), and forestry has only 19 Hosts, or 4.7%.

2.3 Possibility for forest resources utilization

Usually WWOOFers are not required to participate at Hosts' places professionally with a priority on efficiency. So logging operations such as felling, log removal and transportation, etc. which are central to forestry activities may be problematic in terms of technicality safety. However if the Host considered using labor force, contents of operation might be more close to their life such as; food production (e.g. fruits, mushroom, wild vegetables), medical plants, fiber, resin, oil those which related to forset, and/or small logs or branches for fuelwood or tools, are suitable. Complementary relation might be considered during especially rainy and winter times. So not only high forest management, copied forest management group might be recommendable due to short rotation, easy to carry products, easy to processing and so on.

3 Case study of WWOOF Japan and its' forest relation

3.1 A farm

The concepts of the Host as slow life experience, to be enjoyed as part of exchange activities. Main activities are rice production with duck culture, producing many kinds of vegetables, and small scale poultry. Products from the farm are sold to the city residents regularly. Trees are scattered around rice field and gardens in a plain land and arbores locates around the farm and small valley (Fig.1). Forest wood products are utilized mainly as fuelwood, and a few number of small tools and benches. The Host is planning that useful species of trees utilize after large size, but no treatment for the forest now. The farm is introduced by local information for tourisms. WWOOF activities are break during winter.

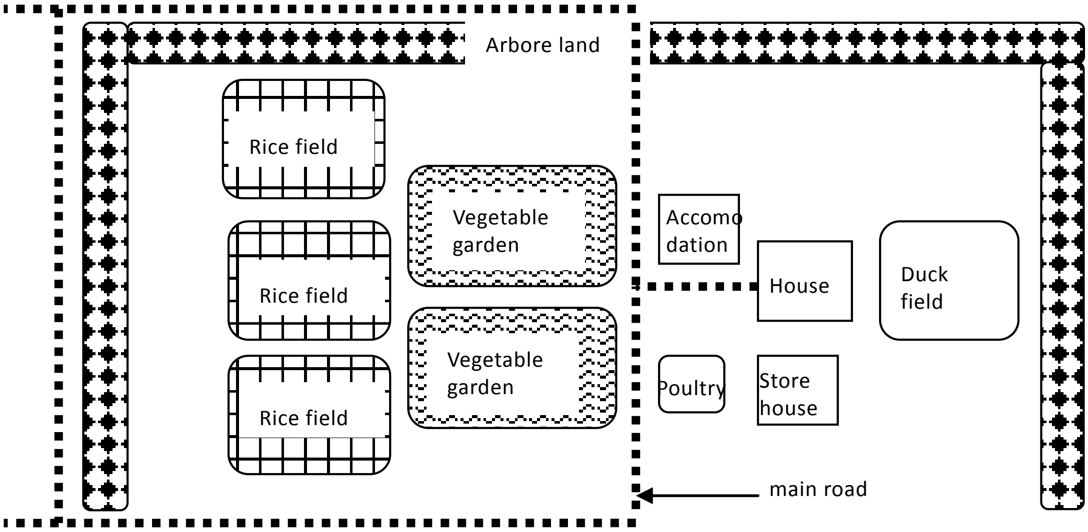

Fig. 1 Images of A farm

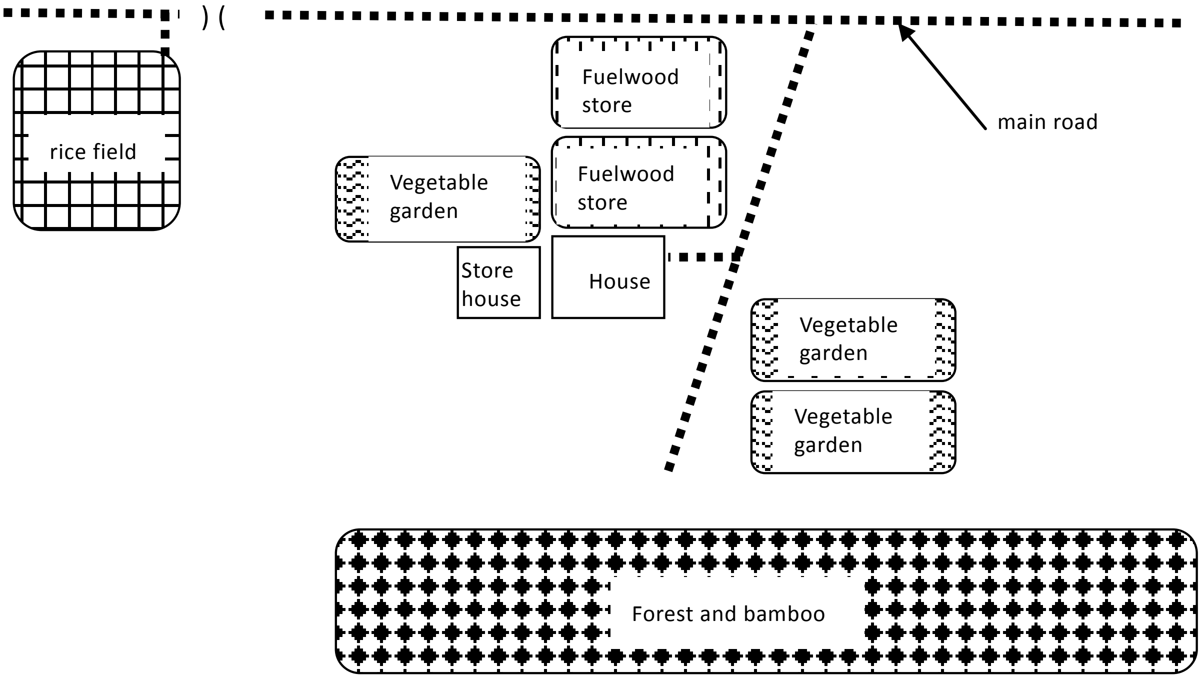

Fig. 2 Images of G farm

3.2 G farm

Self-sufficiency, no electricity life and permaculture implementation are concept of the Host. The Host enjoys activities and enagages the woofer in the activities that they do at their place. No chemical fertilizer and pesticide in agriculture, and mainly using carbonized rice hall, charcoal are applied as organic fertilizer for potato, beans, leaf vegetables. Vegetables with wheat combined in between as companion plants. Rice cultivation is also implemented on rental pieces of land. There is no forest existing on his farm but artificial forest surrounds the community (Fig.2). With forest owners' permission, left over logs in the forest are utilized for warming and fuel for cooking and bathing. Damages from wild animals are the main serious main problems in his farm. Community residence houses are located near the Host house and the Host intimates with them. Not only WWOOFers, but also a lot of people (around 300) visit his farm to stay, have lunch, and engage in talking.

3.3 Diversity of WWOOF Japan activities

A farm and G farm have some similarities such as implementing rice production and cultivating a lot of vegetables. However, differences also could be found as an agricultural method (duck cultivation and companion plants), products strategies (sell products and self-sufficient), intimate relation with urban or communities. Concerned with forest utilization, A farm considered long terms aspects and trees are existing at his farm, but G farm is applying unused logs and bamboo carry out from forest. Main forest resources utilization is similar as fuelwood, but G farm consume much fuel wood for cooking.

4 Discussion and recommendation

Development of economy brought from small scale material rotation in domestic use to global scale material rotation with efficiency and effectiveness. If forest utilization is limited only beneficial business or effective use, it has brought mono-culture which requires less forest diversity. Usually merchandised commodity needs high professional technologies, and it tries to produce less claim materials and those which also obstruction to use of forest diverse.

WWOOF-J activities are a place of exchange where the WWOOFer participates with the Host in the activities they do at their place, in return for a room to sleep in , and to share 3 meals a day with the Host family. So efficiency and effectivities are not a significant criteria for forest resources utilization. For examples, look at forests not only in terms of commercial utilization, but in terms of community life and activities that are rewarding and worth doing in our lives. So forest will find different utilization at the same time, cultural activities in the community are recognized (Fig. 3).

In summary, there is much potential to enliven forestry in Japan. Opportunity exists to assist in realizing this potential via a collaboration between places involved in forestry, organic farming, environment conservation initiatives, and WWOOF Japan. Diversity in forest utilization can be incrased thought

WWOOF Japan Hosts and WWOOFer activities. The provision of menus of options for forest utilization and associated information will be conducive to creating new ways of forest management.

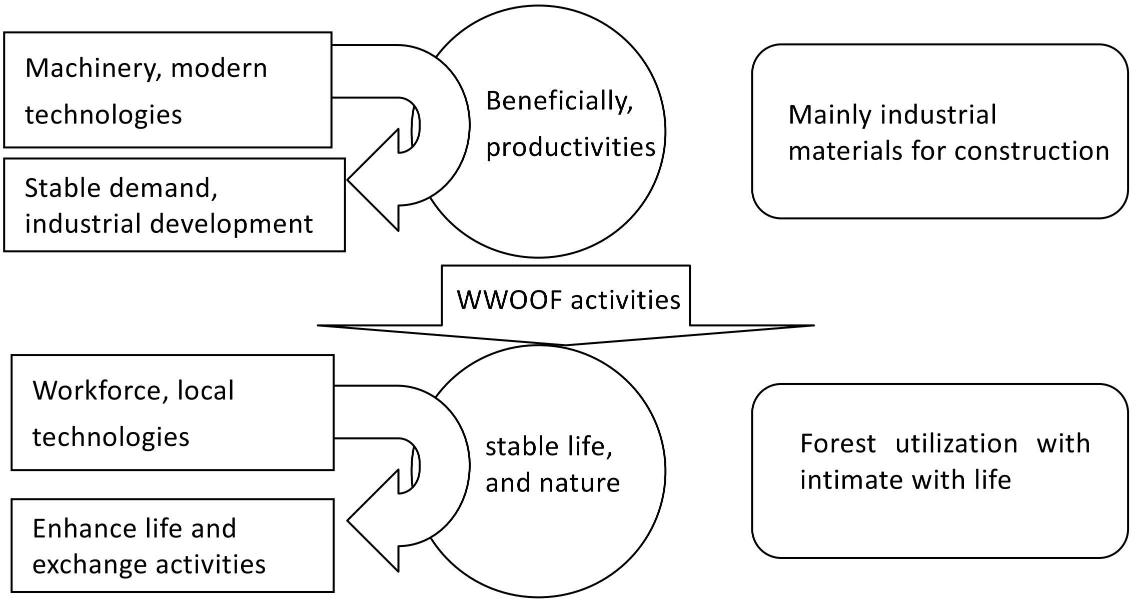

Fig. 3 Change aspects of forest utilization through WWOOF activities

Acknowledgements

We wish to thank to the Host of A farm and G farm to time and efforts sharing during WWOOF activities. We also wish to thank Glenn Burns for important comments and suggestions concerning WWOOF Japan in relation to this paper.

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[PS06]

Gender equality in the Japanese Forest Society -The first decade

What has improved and where is there still need for improvement?

Ryoko Ishizaki[1], Yuko Ota[2], Motoe Miyamoto[3], and Hitomi Furusawa[4]

1 Introduction

Setting up an environment that enables diverse human resources, whether male or female, to fulfill their potential in the field of forest research is an important issue for the development of forest science. The proportion of women researchers in Japan has been on a slight rising trend, and it reached 14% at the end of March 2012 (Cabinet Office, 2013). It remains, however, far below the rates in other major developed countries. The field of forest science is not an exception to this. Most forest scientists have been men, and there is little forest-related research from a gender perspective. The gender issue in forest research has arisen as an actively tackled issue only recently.

The Japanese Forest Society (JFS) is the only academic society in Japan that covers various areas related to forests and forestry comprehensively. The JFS was founded in 1914 and has over 2,000 members now. Most forest science researchers in Japan belong to the JFS, and the state of JFS members could be said to reflect the state of forest researchers in Japan. In 2002, JFS started actions to promote gender equality. Since then, in the last decade, the JFS has established the position of a director concerned with gender equality as a member of the board and has begun activities to promote gender equality within the JFS.

In this paper, we discuss the gender equality issues in forest research in Japan to explore what challenges the JFS has addressed in this first decade and where there is still need for improvement.

2 Research Framework and Method

To clarify the state of gender equality in forest research, we investigated three aspects: (1) The trends and background of the proportion of women in forest research, (2) Research and related activities by women researchers, and (3) The status of the balance between the work and private lives of women researchers.

To get an idea of the basic status of gender equality among forest researchers, we used the data from the membership lists of the JFS (Table 1). We learned the gender balance, age structure, and differences

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between student members and other general members from the membership list data. To understand the current status, we used the membership data as of June 2013. To learn the status from 10 years ago, we used the data from fiscal year (FY; April 1 to March 31) 2004, which is the oldest data we could obtain. The exact date that we collected the FY2004 data is unfortunately missing. The data from the members list, which has both sex and birth date, were used to analyze the proportion of women researchers by sex and age group. The data that were used in this analysis came from 75% of the JFS members in FY2004 and 79% of the JFS members in 2013.

Table 1: Basic information from the JFS member lists

	FY2004			2013		
Data acquisition	FY2004 (The exact date is missing)			11 June 2013		
Number of members	Total	General members	Student members	Total	General members	Student members
	2,770	2,045	725	2,183	1,770	413
Members who registered sex and birth date	2,069	1,386	683	1,730	1,391	339
Proportion of members	75%	68%	94%	79%	79%	82%

Source: JFS member lists from FY2004 and June 2013.

To investigate the background and meanings of the results from the analysis described above, we checked the data on the proportion of women students who had majored in forestry courses at four main universities in Japan. We also referred to the data from the Basic School Survey conducted by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) as well as from some reports on related issues.

To understand the activities of women researchers, we used data on head presenters by sex at the annual JFS conferences, the JFS board member lists, and the member list of the forest-related committee with which some forest researchers are involved as academic experts. The first data were collected by counting the names on the programs. Some presenters, 6% on average, could not be identified by sex using only their names, and those presenters are excluded from the data counted.

Lastly, to determine the status of researchers' work-life balance, we mainly used the results of a survey by the Japan Inter-Society Liaison Association Committee for Promoting Equal Participation of Men and Women in Science and Engineering (EPMEWSE) as well as a separate EPMEWSE's survey report containing only the responses of JFS members. Unfortunately, the results from the latest surveys have not been published yet, so we could not examine the changes in this decade; we could examine only the recent statuses.

3 Result: The Status of Women Researchers in the Forestry Field

3.1 The proportion of women forest researchers

3.1.1 The proportion of women JFS members

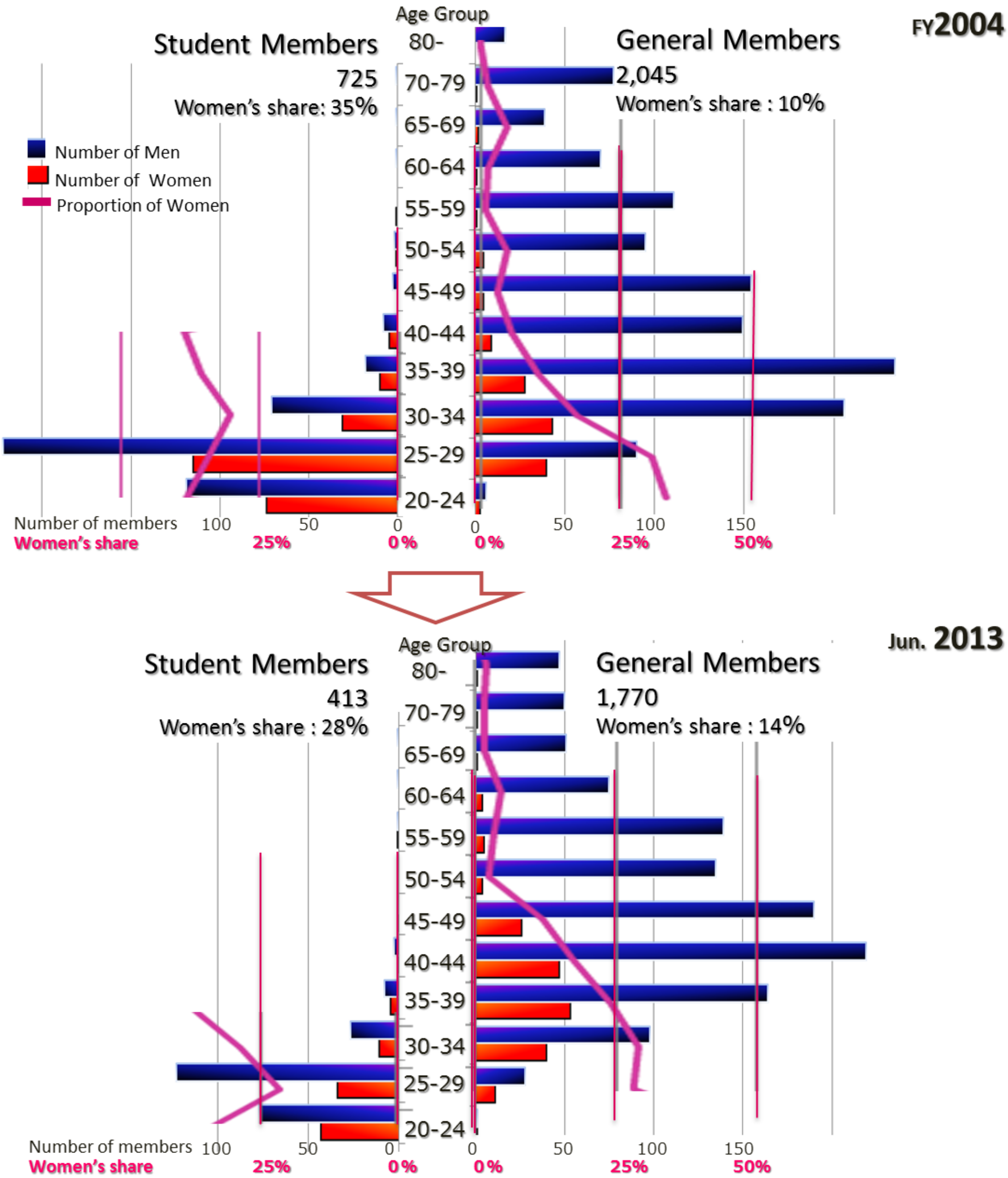


Figure 1: The proportion of women JFS members by sex, age group, and membership type
Source: Calculated using JFS member lists from FY2004 and June 2013.

Figure 1 shows the change in the proportion of women JFS members. The proportion of women was 16% in June 2013. This proportion is close to but a little bit higher than the average among all researchers in Japan. The proportion of women JFS members was reported to be 13% in January 2004 (Maruta, 2005), so compared with this, the proportion of women has increased slightly in the last 10 years.

The proportion of women among the general members differs markedly by age group. From the early 50s (with 3% women) and older in 2013, the proportions of women are obviously low. Among the younger age groups—from the late 40s (12% women) to the early 30s (29% women)—in 2013, the proportions of women increased gradually, and the proportions of women in the much younger age groups remains at 30%

or so. Comparing these proportions in 2013 with those in FY2004, in FY2004 in the early 40s (6% women) and older age groups, the proportion of women was low overall. From the late 30s (11% women) to the early 20s (33% women) in FY2004, on the other hand, the proportions of women increased. The basic trends in FY2004 and 2013 are similar, and the changes seem to be the same for each generation; that is, for instance, the numbers for the women in their early 40s in FY2004 are roughly the same as those for the women in their early 50s in 2013. The figure clearly indicates that the proportion of women has been increasing mainly among the generation who are in their 30s and 40s in 2013.

3.1.2 The proportion of women students

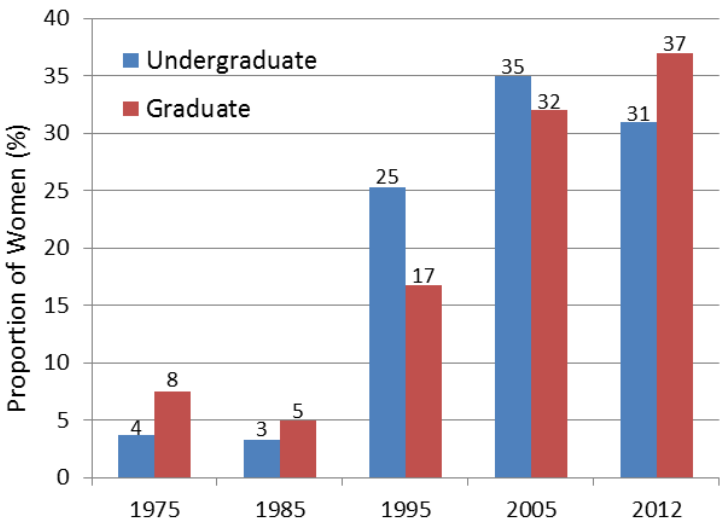


Figure 2: The proportion of women students in forest science courses at four main universities

Note: These proportions are the averages of the proportions from four main universities with forest science courses in Japan. The universities from which data were collected are the University of Tokyo, the Tokyo University of Agriculture and Technology, the Tokyo University of Agriculture, and Nihon University.

Sources: For 1975 to 2005 data, see Maruta and Ota (2006).

People in their 30s and 40s in 2013 are the generation who were students during the period in which the numbers of women students majoring in forest science rapidly increased in universities and graduate schools. Figure 2 shows when and how the numbers of women forest majors increased in universities. According to this figure, the proportion of women rapidly increased from 1985 to 2005. During this period, the change in the general proportion of women students at universities was not so significant (Cabinet Office, 2013 and MEXT, 2011). There was only a slight increase in the late 1980s, but there was no notable change from the 1990s onward. This means that the rapid increase in the proportion of women in forestry courses cannot be explained solely by the increase in the number of women students at universities in general but specifically reflects an increase in the number of women students who willingly chose forestry as a major.

The increase in the number of women students, however, did not directly lead to an increase in the number of women researchers. According to Figure 1, among women in their 30s in FY2004, the generation in which the number of women students began to increase, the proportion of women who were general JFS members was lower than that of student members in the same age group. This seems to indicate that there could be some obstacles preventing women students from getting jobs as researchers. Among women in their late 20s in FY2004 and in their late 20s and early 30s in 2013, on the other hand, the proportions of women students and general women members are not very different. This seems to indicate that the obstacles have lessened for the later generations, and if that is the case, it can be commended as a significant improvement from the aspect of gender equality. During this period, some public research institutes and universities started to tackle the gender equality issue and provided support systems for women researchers. Some of them are currently implementing the active recruitment of women researchers. These changes are aimed at supporting the placement of young women as researchers.

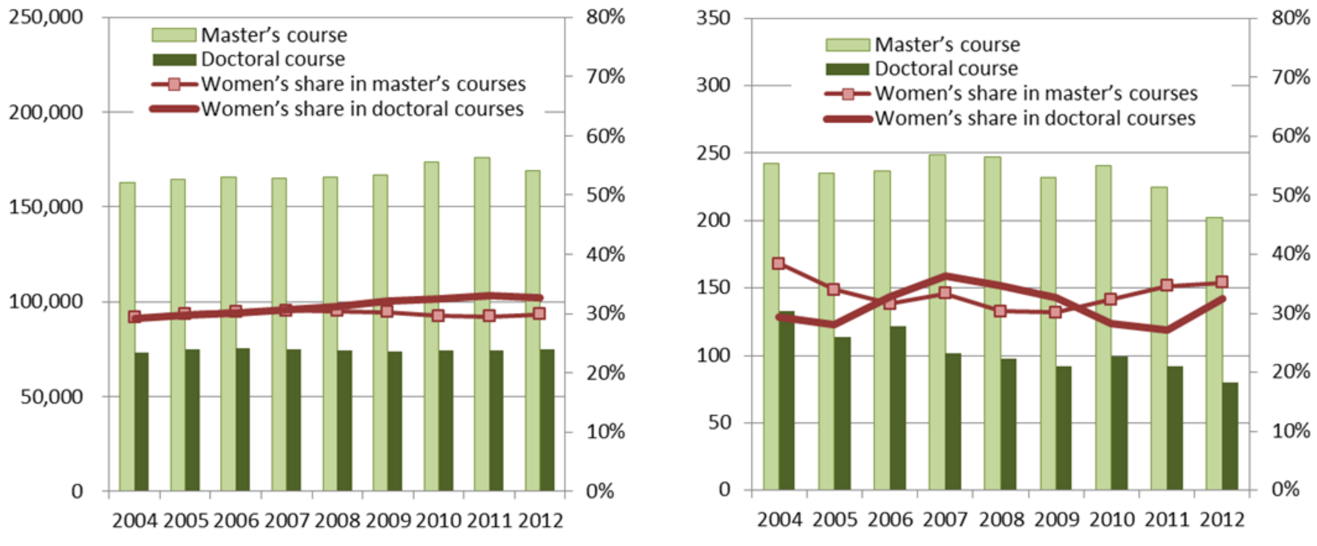
3.1.3 Decrease in young members

The dramatic decrease in young members is a crucial issue for the future of forest research, although the proportion of women among the younger generations has been improving. The numbers of younger JFS members have been decreasing rapidly after peaking in the early 40s age group in 2013. In particular, among student members, the number of younger members dramatically decreased, by 43%, from FY2004 to June 2013.

Some possible reasons for this are the decrease in the number of students and the decrease in the proportion of students belonging to the JFS. The latter reason could be affected by the establishment and expansion of peer academic societies, such as environment- or ecology-related societies, in recent years. Recent students and young researchers now have many options of academic societies to belong to, and thus, the number who choose the JFS may possibly have decreased.

To examine the possibility of the former reason—the decrease in the number of students—the data from the survey conducted by MEXT are shown in Figure 3. The number of graduate students in Japan as a whole was stable or increased slightly from FY2004 to FY2012. In the case of graduate students in agricultural fields, including forestry courses, the number of students in master’s courses increased an average of 10%, but the number in doctoral courses decreased over 10% in the same period (MEXT, annually published). Looking at the students in forestry courses in these data, the number of students in master’s courses decreased 17%, and the number in doctoral courses decreased 40% in the same period. The last percentage is similar to the percentage of the decrease in the number of JFS student members.

As one reason for the decrease of doctoral students in agricultural fields, Misu et al. noted the uncertainness of the career path after completing a doctorate (Misu et al., 2010). The results of the analysis of the number of researchers by sector show that the number of researchers belonging to public research institutes decreased by 7% from 2005 to 2009, whereas researchers belonging to universities decreased only by 1% and researchers belonging to private companies increased by 5% (Misu et al., 2010). General JFS members in September 2012 consisted of 39% university researchers and 35% public research institute researchers; researchers belonging to private companies were somewhat the minority. The high proportion of public research institute researchers characterizes the JFS's members, and the decrease in the proportion of public research institute researchers could affect the number of JFS members more greatly than the number of members from other research fields.



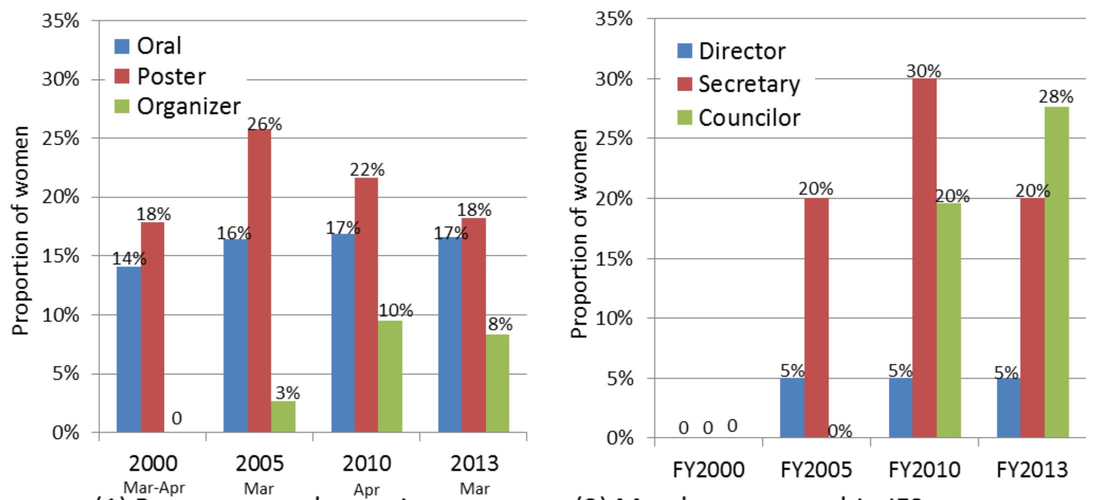
(1) Total (2) Forest Science

Figure 3: Enrollment in forest science courses at graduate schools

Sources： MEXT basic survey of schools (annually published).

3.2 Activities by Women Researchers

3.2.1 The proportion of women presenters at the annual conferences



(1) Presenters and organizers (2) Members engaged in JFS management

Figure 4: Activities by women in the JFS

Sources: For 2000 to 2010 data, see Miyamoto and Okochi (2011). The 2013 data come from the program of the 2013 annual conference and the member list of the JFS board in FY2013.

According to the data in Figure 4(1), the proportions of women presenters at the latest conference, in 2013, were 17% in the oral sessions and 18% in the poster sessions. Both of these are a bit higher than the proportion of women JFS members. The proportion of women head presenters of oral sessions increased from 2000 to 2010. Among the organizers of the theme sessions, on the other hand, there were no women in 2000. After that, the proportion of women increased to just below 10% by 2010. The proportion of women in their 40s and 50s, who are considered the main age group for organizers, is 11% in June 2013, and the proportion of women organizers remains just below this rate.

3.2.2 The proportion of women engaged in JFS management

The data in Figure 4(2) show that the proportion of women engaged in JFS management increased during this decade, whereas there were no women engaged in JFS management in FY2000. Among the secretaries, who engage in administrative work to support the directors, the proportion of women is similar to the proportion of women JFS members in their 30s. This indicates that in these age groups, not only men but also women members play active roles as secretaries in the JFS.

The most remarkable increase in this decade is seen in the proportion of women councilors. This was sparked by letters from the JFS board that were enclosed with the ballots for the election of JFS councilors. Since the election of JFS councilors for FY2006–2007, the vote for which was held in winter 2005, the JFS board has enclosed a letter of appeal for the consideration of promoting the selection of younger councilors and women councilors along with the ballots. After they began enclosing this appeal, the proportion of women elected as councilors sharply rose to roughly 20% and reached 28% in the latest election, for FY2012-2013; in contrast, there were almost no women councilors in the JFS before this. This can be recognized as a significant achievement stemming from a positive action by the JFS board.

In contrast to the case of councilors, most JFS directors, who are mainly elected from among the councilors, are men even now. JFS directors are typically in their 50s or 60s, and the low proportion of women directors could be understood as a reflection of the low proportion of women in these age groups. The expansion of the proportion of women in leading JFS positions such as director remains as a future issue to be addressed.

3.2.3 The proportion of women in government committees

Some leading researchers are involved in government committees as academic experts. The Forestry Policy Council established by the Ministry of Agriculture, Forestry and Fisheries (MAFF) under the Forest and Forestry Basic Act is the council that studies and deliberates on important matters concerning forest policy. The proportion of women council members has been relatively high. Already in FY2000, the proportion of women was 20%, and it reached 35% as of the latest member list for FY2013. Most of the women council members, however, are not forest researchers but representatives of nonprofit organizations for volunteer activities, announcers, journalists, or forest owners. The council for FY2013 has seven women councilors, but among those, only one is a forest researcher.

The forest policy revision committees, on which members discuss measures for forest policy reform from February to November 2011, are also forest-related government committees. The proportion of women on these committees was 6%, 3 of 50 members, and this limited number of women members were a forest owner, a representative of a consumer group, and a writer, but none was a researcher. Many forest researchers are involved in the committee, and some of them are relatively young researchers, in their 30s or 40s. Compared with how the proportion of women in these age groups has increased the member selection process for this committee can be considered to be behind in terms of women's involvement.

As described above, activities by women researchers have surely spread in some areas, such as in conference presentations and JFS management, whereas in leading positions and in the policy-making process, the involvement of women researchers is limited at this moment. One reason for this could be considered a reflection of the low proportion of women among the older researchers.

3.3 Work-life balance of women researchers

As a reason for the low proportion of women in leading positions, many JFS members actually noted the low proportion of women among elder researchers according to the results of the survey conducted in 2007 (Figure 5). The reason that was most often cited, however, was the difficulties in work-life balance. This result indicated that the problem of balancing work and private life remains as a serious issue for women researchers still today.

The noticeable gap between the ideal number of children to have and the real number of children that people have can be considered an example of the struggle of women researchers with work-life balance. The results of the JFS member survey referred to above show that the real number of children women forest researchers have is only 0.5 on average, even among those in their early 40s, whereas the ideal number is two or three for most forest researchers, both men and women. Men forest researchers, on the other hand, have nearly two children on average in their late 40s. As a reason for the great gap between the ideal and actual numbers of children that women researchers have, more than half of women noted the difficulty for them of maintaining their careers as researchers while doing family work at the same time. Actually, the burden of family work, such as housework, child care, and elder care, is largely borne by women in general in Japan. The time spent on family work by Japanese men is reported to be at the lowest level on a global basis (Gender Equality Bureau, 2012). Among researchers, a similar situation can be observed. The survey by EPMEWESE reported that the men researchers rarely take child care leaves and even if they do, they most often take less than 1 month of leave, whereas women researchers take 6–12 months of leave at most (EPMEWESE, 2008).

Work-life balance is a serious issue for young researchers who are not only at the marriage and child-bearing age but also facing highly competitive circumstances for getting or keeping their positions. In a round-table discussion that JFS held as a session during the 2012 annual conference, some young participants complained of anxieties about their life plans, such as difficulty finding a period to have children, and many participants both male and female took a strong interest in those issues (Miyamoto et al., 2012). Work-life balance is becoming a common issue for many researchers including men recently.

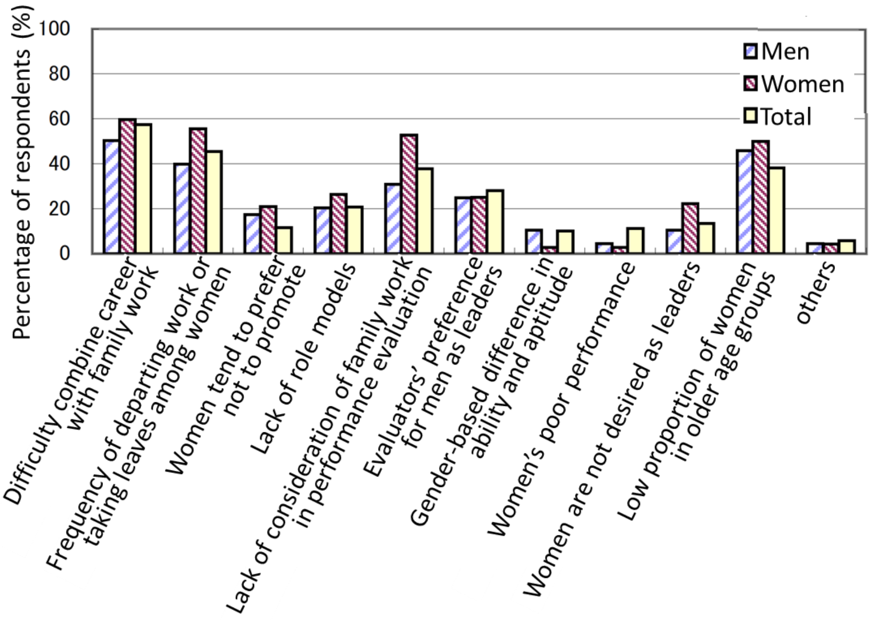


Figure 5: Reasons for the low proportion of women in leading positions (multiple answers)
Sources：JFS gender equality working group (2008)

4 Discussions and Conclusions

From the results shown above, the following two facts can be observed regarding improvements in this decade concerning gender equality among forest researchers in Japan: (1) the significant increase in the proportion of young women researchers and (2) the noticeable expansion of women researchers' activities in presenting at the conferences and in JFS management.

The following two areas, on the other hand, are noted as still needing further improvement: (1) the expansion of women researchers in leading positions and in the policy-making process and (2) efforts to address the work-life balance issue. Furthermore, it is additionally clarified through these analyses that the numbers of young researchers in the JFS have significantly decreased in this decade and the activation of the forest research field and of the JFS itself are a great challenge for the future.

Possible approaches to addressing the two challenges concerning gender equality noted above would be (1) affirmative action in recruitment and promotion as transitional measures before the generation changes and (2) improving the working environment to allow for various working styles in consideration of work-life balance, not only for women but also for men, not only for child care but also for elder care, and not only for younger researchers but also for researchers in leading positions. Through these actions, diversity among forest researchers could be promoted, and in that way, the field of forest research and the JFS are expected to be activated. Getting diverse perspectives, including with regard to gender, into forest research would be significant for this activation. Additional efforts to activate forest research and promote the significance and importance of forest research to the public are also required to sustain forest research.

The JFS could contribute to these challenges by sharing information and appealing to the authorities concerned with the issue. Activation of forest research is definitely a crucial issue in which the JFS is expected to play a leading role.

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[PS07]

Gender Differences in Students' Attitudes toward Forest

A survey of university students in Kyoto, Japan

Mari Kawase[1] and Koji Matsushita[2]

1 Introduction

Understanding people's attitudes toward forests is important for developing forest-management strategies. Several Japanese researchers have studied the attitudes of non-Japanese populations toward forests (e.g., Shidei et al., 1981: Imanaga et al., 1994: Yoshida et al., 1998: Imanaga and Yoshioka, 2002). The results of these studies have been compared with the attitudes of Japanese individuals toward forests (e.g., Shidei et al., 1981), and this international comparison has contributed to revealing differences in attitudes across countries.

In the early stages of research on attitudes toward forests, gender differences were discussed (e.g., Shidei et al., 1981: Imanaga et al., 1993). However, the focus later shifted to differences according to age and geographic location. Shidei et al. (1981) reported that a survey of attitudes toward forests among the Japanese general public found gender differences in preferences related to sports and places to travel. Imanaga et al. (1993) reported that male and female Japanese high-school students differed in their preferences for places to travel and that more female than male high-school students felt connected to forests and nature.

The purpose of this research was to provide a preliminary examination of gender differences in attitudes toward forests to serve as a foundation for future studies. This study focused on the attitudes of university students in the city of Kyoto.

This study used the questionnaire used by Imanaga (1997), which consists of series of questions addressing attitudes related to forests including preferred places for traveling and walking, favorite trees, spiritual feelings toward forests and trees, ways to manage beautiful forests, issues pertaining to sports and hunting, and reactions to pictures of forests.

This study used multiple logistic regression analysis to identify cause–effect relationships involving multiple factors. This was important because scant data concerning whether people's attitudes toward forests are influenced by multiple factors are available. Sex, age, and academic major were selected as candidate factors. Studies related to the perceptions of Japanese people regarding forests have identified several factors that may influence attitudes toward forests. Ogasawara et al. (1990) reported that perceptions of forests may differ by age. In terms of young people, Ikeda et al. (1994) found that students' perceptions can be influenced by their education as more students from agricultural than from non-agricultural high schools placed importance on timber production in forests.

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This paper is organized as follows: Section 2 describes our methods, Section 3 presents the results, Section 4 compares our study with previous studies and discusses the results, and the final section summarizes this research.

2 Methods

Surveys were conducted during lectures presented on October 18, 2011, June 22, 2012, and December 11, 2012. Respondents consisted of university students (18–23 year of age) in Kyoto, Japan. The students selected one of the three lectures related to forests and forestry presented at the university. The valid response rate was 90.3%. (37 females and 75 males); 79 students were majoring in a forest science course, and 33 were majoring in other subjects.

This study examined six questions related to attitudes toward forests, which were presented from two perspectives: one perspective emphasized forests as collections of trees, and the other emphasized trees as components of forests. Table 1 presents the questions posed from within each of these perspectives, and choices are shown in parentheses. The order of the questions in the actual questionnaire was 1, 2, 5, 6, 4, and 3. R ver. 2. 12.1 was used for all statistical analyses. Multiple logistic regression analysis was used to analyze all data, with candidate factors related to sex, age, and major.

Table 1: Categorization of questions

Perspective A: Forests as collections of trees	
Q. 1 "Where would you like to go traveling?" (large forest/old temple/expansive beach/highland pasture/hill with a good view/ steep rocky hill/placid lake/other)	
Q. 2 "Do you like to take walks in forests?"	(Like/Do not like/Dislike)
Q. 3 "When you see the sunrise or the sunset, or when you are in a quiet forest (*yama* in Japanese), do you feel something spiritual?"	(Yes/No)
Perspective B: Trees as components of forest	
Q. 4 "When you see a huge old tree, do you feel something spiritual?"	(Yes/No)
Q. 5 "Write the names of five trees of which you are fond."	
Q. 6 "Of the five trees in Q. 5, which is your favorite?"	

3 Results

3.1 Forests as collections of trees

Table 2 presents the rankings of favorite places to travel (Q. 1) by gender. In total, 8.9% of all respondents chose "large forest," and younger and male students were more likely to choose this response than were older ($p < 0.05$) and female ($p < 0.1$) students, respectively.

In response to Q. 2, 93.8% of students answered that they liked to walk in forests. Male students and those who were majoring in forest science tended to like to walk in forests more than did female students ($p < 0.05$) and those not majoring in forest science ($p < 0.1$), respectively.

In response to Q. 3, 75.0% of respondents answered that they felt something spiritual. Female students were more likely to report having this reaction than were male students ($p < 0.05$).

With regard to Q. 2 and Q. 3, female students who liked to walk in forests were more likely to report having a spiritual response than were male students ($p < 0.1$).

Table 2: Rankings of travel destinations (Q.1)

Rank	Female Students	Male Students
1	Hills with a good view (24.3%)	Placid lake (30.7%)
2	Placid lake (21.6%)	Hills with good view (18.7%)
3	Old temple (18.9%)	Old temple (16.0%)
4	Expansive beach (16.2%)	Large forest (10.7%)
5	Highland pasture (10.8%)	Highland pasture (9.3%)
6	Large forest (5.4%)	Steep rocky hill (5.3%)
7	Other (2.7%)	Other (5.3%)
8	Steep rocky hill (0.0%)	Expansive beach (4.0%)

3.2 Trees as components of forests

In response to Q. 4, 86.6% of respondents answered that they felt something spiritual, and female students were more likely to report having this experience than were male students ($p < 0.1$).

With regard to Q. 5, students identified 97 kinds of trees as among their favorites. Trees that ranked high included the Japanese cedar (*Cryptomeria japonica*), Japanese cypress (*Chamaecyparis obtusa*), cherry (*Prunus*), pine (*Pinus*), camphor (*Cinnamomum Camphora*), and ginkgo (*Ginkgo biloba*). More male than female students preferred Japanese cypress and camphor trees ($p < 0.1$).

In terms of Q. 6, 36 kinds of trees were cited as the favorite of students. Trees that ranked high included the cherry, maple (*Acer*), Japanese cypress, camphor, and pine.

Table 3 presents rankings of favorite trees (Q. 5 and Q. 6) by gender. The top five trees in Q. 5 and the top four trees in Q. 6 are shown. Lower-ranking trees are not listed because they were preferred by substantially fewer respondents. The total number of answers to Q. 5 was calculated by multiplying the number of respondents (37 female and 75 male) by five (the number of trees they were asked to provide). Thus, female students provided 185 responses (37 multiplied by 5), and male students provided 375 responses (75 multiplied by 5).

According to the responses to Q. 5, Japanese cedar was preferred by both female and male students. Cherry and pine were also cited by both genders. Ginkgo and maple were cited only by female students. Table 3 reconfirms that Japanese cypress and camphor were preferred only by male students. According to the answers to Q. 6, cherry and maple were preferred by both female and male students. Fragrant olive (*Osmanthus fragrans var. aurantiacus*) was preferred only by female students, and zelkova (*Zelkova serrata*) was preferred only by male students. Camphor, which was preferred by male students in Q. 5, was not preferred by male students but was preferred by female students in Q. 6.

Table 3: Rankings of favorite trees by gender (Q. 5 and Q. 6)

Rank	Q.5 (Five favorite trees)		Q.6 (Favorite tree)	
	Female Students	Male Students	Female Students	Male Students
1	J. cedar (11.4%)	J. cedar (10.4%)	Maple (16.2%)	Cherry (13.3%)
2	Cherry (10.8%)	J. cypress (8.8%)	Cherry (13.5%)	J. cypress (10.7%)
3	Ginkgo (7.6%)	Cherry (8.3%)	Fragrant olive (13.5%)	Maple (10.7%)
4	Pine (7.0%)	Pine (8.3%)	Camphor (10.8%)	Zelkova (8.0%)
5	Maple (7.0%)	Camphor (7.7%)		

4 Discussions

4.1 Comparison with previous studies

Previous studies examined gender as only one aspect of the demographic characteristics of respondents (e.g., age and geographic location), and very little information regarding differences in people's attitudes toward forests according to gender is available. This study used the same questions used by Shidei et al. (1981) and Imanaga et al. (1993). Shidei et al. (1981) compared the attitudes of Japanese, German, and French individuals toward forests, and Imanaga et al. (1993) examined high-school students and university students in Kagoshima Prefecture, Japan with regard to this issue. The gender differences observed in our study can be compared with those found in these previous studies. The international comparison provided by Shidei et al. (1981) may be useful for examining the attitudes of Japanese people. Although the study conducted by Imanaga et al. (1993) reported gender differences among high-school students, it did not present the results for university students by gender. However, their results allowed us to compare the tendencies of university students irrespective of gender. Because the surveys were conducted at different times and in samples that differed in terms of age and location, any comparisons should be interpreted cautiously. Indeed, our discussion of this comparison is provided as supplementary information.

In terms of Q. 1, Shidei et al. (1981, p. 79) showed that a large forest was chosen as a place to travel by more than 50% of German respondents but was selected by only a small percentage of Japanese people. That 8.9% of university students in our study chose this destination more closely resembles the data for Japanese people than for German people reported by Shidei et al. (1981). Indeed, the attitudes of Japanese people toward traveling to a large forest according to our study were consistent with those reported in the previous study, despite considerable differences between the two studies.

Imanaga et al. (1993, p. 20, p. 21) found that a larger proportion of university students majoring in agriculture than in engineering, law and letters, or education would like to travel to a large forest. Our study did not reveal differences in the desire to travel to a large forest between forest science students and students in other majors. Because universities offer a variety of majors, the majors that are chosen for the comparison can influence the results.

With regard to Q. 2, most university students included in the study conducted by Imanaga et al. (1993, p. 21, p. 22) enjoyed walking in forests. This is consistent with our results. Gender differences in the desire to walk in forests were not reported by Shidei et al. (1981, p. 80, p. 81). Thus, the preference of male students for walking in forests may be unique to the university students in our study. Whether this difference was the result of the age group included in our research or the timing of the survey remains unknown. Imanaga et al. (1993, p. 29) found that more female than male high-school students enjoyed walking in forests, and this contrasts with our results among university students, which implies that differences between genders in the preference for walking in forests may differ by age.

The data obtained by Q. 3 and Q. 4 suggest that the tendency of the students in our study to have a spiritual experience in response to nature or the presence of huge old trees resembles the tendency of Japanese, German, and French members of the general public (Shidei et al. 1981, pp. 86–88) and high-school and university students (Imanaga et al. 1993, p. 23) in this regard. This result supports the idea that having spiritual feelings toward nature is common, regardless of age or country.

In terms of Q. 5 and Q. 6, the students' favorite trees were also preferred by the Japanese respondents in the study conducted by Shidei et al. (1981, p. 91, p. 92) and the students in the research conducted by Imanaga et al. (1993, p. 22). In response to Q. 6, the university students in our study chose cherry trees as their favorite, which matches the preference of high-school and university students in the study conducted by Imanaga et al. (1993, p. 22). These results indicate that cherry trees are preferred by students, probably because these are commonly planted in schools in Japan.

4.2 Gender differences in walking and spiritual feelings

With respect to Q. 1 and Q. 2, male students were more likely to prefer taking a walk in a forest and travel to a large forest than were female students. This indicates that male students like to visit forests more than do female students, but the reason for this difference was not determined. However, the responses to Q. 2 and Q. 3 revealed that fewer male than female students had spiritual experiences in such settings.

According to the answers to Q. 3 and Q. 4, female students were more impressed by huge old trees, sunrises and sunsets, and the quiet atmosphere in forests than were male students. This study indicates that more female students feel relaxed when they commune with nature. However, this spiritual feeling does not motivate female students to walk in or travel to forests. The reason for this discrepancy might be that the questions asked about respondents' attitudes toward a peaceful natural atmosphere and a possibly spiritually meaningful old tree by using the words "sunrise," "sunset," "a quiet forest," and "a huge old tree" rather than asking about natural phenomena. We inferred that female students did not have spiritual feelings toward trees or forests *per se* but that they were impressed by a peaceful atmosphere in a natural setting and by the holiness of a huge old tree.

4.3 Gender differences in students' favorite trees

The questions related to the perspective from which forests were seen as collections of trees did not refer to particular species of trees. Questions 5 and 6 provided information about the kinds of trees that respondents liked. More male than female students preferred Japanese cypress and camphor trees. Japanese cedar is as famous as is Japanese cypress for timber production in Japan. However, no gender differences concerning Japanese cedar were observed. This study predicted that students majoring in forest science would differ from those with other majors in their preference for Japanese cedar and Japanese cypress because forest science students would be learning about timber production. However, differences according to major were not found; instead, a significant gender difference with regard to Japanese cypress was observed. The results for camphor trees are difficult to understand and require further study because it is the tree associated with the university from which the sample was drawn; thus, students' attitudes toward this tree may differ from those toward other trees.

We could not enumerate all the tree species cited by the students as among their favorites because very few respondents cited the species with lower rankings. Future studies should include more respondents.

5 Conclusions

The purpose of this study was to examine gender differences in university students' attitudes toward forests. University students in Kyoto, Japan majoring in forest science and other fields completed questionnaires. Attitudes toward forests were examined in terms of two perspectives: one viewed forests as collections of trees, and the other viewed trees as components of forests.

Although this study is a preliminary investigation and included a relatively small sample of 18- to 23-year-old university students, we were able to identify gender differences that have been relatively neglected in the past.

Future studies should include respondents from younger and older age groups to elaborate on this research. Younger age groups could include junior-high-school and high-school students to enable examination of the process by which attitudes toward forests are developed. Investigations of older age groups will be useful for understanding how attitudes toward forests change as a function of time. This study was not able to examine less popular trees because of the small sample. Thus, future studies should also include more respondents.

Acknowledgements

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[PS08]

How can non-residents manage past community-based forestry?

-A case study in two regions living with giant Japanese horse chestnut trees in Tamba Highland, Japan-

Yoshihiko IIDA[1]

1 Introduction

Local residents in a mountain village have managed their neighbor forest by their responsibility until these decades in Japan. However, recent situation such as aging and depopulation in a village level and social-economical shift in nation-wide scale changes forest management especially in remote mountainous villages. The problem is that the declining local society has less power enough to maintain forest resources which was once well managed in the past. This means that non-residents can contribute more for forest management on behalf of the locals. In recent, non-residents from the outside of a village are more powerful actors who make an effort to support forest management with the aged locals. Thus, forest landscape in the future will reflect as a result of collaboration between the local residents and the non-residents through new forest management. Though, there are little arguments about the movement of non-residents in forest management with local residents.

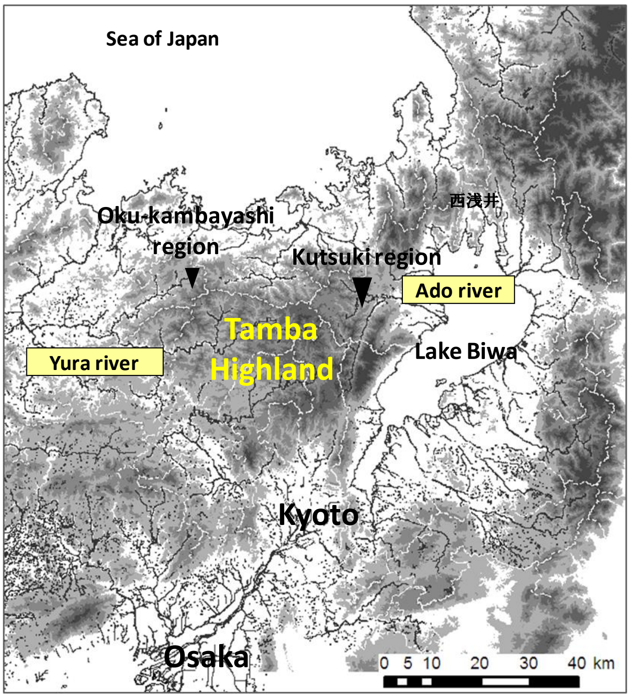

Figure 1: Location of research regions

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In this study, I aim to clarify social framework of forest management mixed with the non-resident actors and the locals and also discuss on roles and future challenges of the non-residents for sustainable forest management. For the sake of the research objective, I selected two groups related to forest management in two remote mountain areas, Oku-kambayashi region in Ayabe city and Kutsuki region in Takashima city, in Tamba highland located in central Japan (Figure1). These areas have a forest where nurture hundreds of giant Japanese horse chestnut tree (*Aesculus turbinata* Blume; hereafter called as 'tochi') and forest management related to these gigantic trees just starts since around 2010.

I conducted participatory observation in various kind of activities of two groups, which are 'Kyoboku-to-suigen-no-sato-wo-mamoru-kai' in Kutsuki region and 'Koya-de-ganbarou-kai' in Oku-kambayashi region since 2011 and made a non-constructed interview with the group members and the local resident in Udotani village of Kutsuki region and in Koya village of Oku-kambayashi region. I also have joined in research activity both of two groups to understand the spatial distribution and size of tochi trees. Both show hundreds of tochi trees including giant size has been already recognized for recent 2 years.

2 Kutsuki region

2.1 Outline of the region

Kutsuki region (about 165.4 km^2), belonging to Takashima city located in the north-western part of Shiga prefecture, is the head area of Ado river which flows into Lake Biwa. This mountainous region has been well known as forestry production area since Nara era (around the 8th century A.D.). About 90 % of the land is covered by forest which is mostly privately owned. According to forest census in 2000, the forest consists of 47.6% of planted forest such as Japanese cedar (*Cryptomeria japonica*) and Japanese cypress (*Chamaecyparis obtusa*) and the other 50.2% of natural secondary forest [1].

2.2 Situation of past forest management in a village for several decades

In 1950s, charcoal production after cutting down sawtooth oak (*Quercus acutissima*), konara oak (*Quercus serrata*), Mongolian oak (*Quercus mongolica* var. *grosseserrata*) and so on was one of main livelihood in many villages in Kutsuki region [2]. The local had made a fertilizer for rice production, until the middle of 1950s, using Japanese pampas grass (*Miscanthus sinensis*) and sprouts of coppices (named as '*Hotora*' cutting) on which farming cows stepped and strewed excrement and urine [1]. Many of broad-leaved trees was cut down for materials of pulp production at the rapid economic growth between 1960s-1970s, and Japanese cedar and Japanese cypress were planted on the remnant. Some in Udotani village (located in the central of Kutsuki region) worked for forestry as daily livelihood near the village but the others worked outside in factories, companies and golf courses for a long time.

2.3 Movement on Japanese horse chestnut trees

The nuts of tochi were traditionally used as tochi rice cakes eaten during the New Year periods in the village. This utilization of the nuts was only seen in the household level before tochi rice cake was sold as local specialty in the Sunday morning market established in the end of 1980s. The production of tochi rice cake in Udotani village was activated for selling in the market and other cities in 1990s. The relationship between tochi trees and the locals in Udotani village was relatively strong tied at that moment, however, the production members told that wild animal consumption, especially by deer, of the nuts and aging of themselves made them difficult to gather and carry heavy nuts in a steep valley in every September.

2.4 'Kyoboku-to-suigen-no-sato-wo-mamoru-kai'（巨木と水源の郷を守る会）

Lumbering of several tens of gigantic tochi trees (over 1m in the diameter of breast height) at several sites by private logging company in Kutsuki region occurred around 2008-2009 (Photo 1), because tochi woods had become valuable to make furniture and interior decoration for urban luxury apartment that had been constructed in these years. For improving this situation in the heads of water streams, 'Kyoboku-to-suigen-no-sato-wo-mamoru-kai' was established, in October 2010, to achieve the conservation of giant Tochi trees and surrounded mountainous ecosystem. Shiga prefecture decided to form a budget five million yen for maintenance project on large old trees using forest tax in fiscal 2011. The project includes sub-project such as improvement of pathway to access giant Tochi trees grown in steep valleys and additionally measuring and installation of signboard on the trees, finally financial support for the owners to manage and conserve tochi trees.

Members of this organization consist of 19 local people who were mostly aged over around 60 years old from Kutsuki region and 10 outsiders at its foundation, though the members increased up to total 55 people in May 2013. According to annual events from April 2012 to March 2013 of the organization (Table1), the organization focuses on not only investigation of the actual conditions of giant Tochi trees but also local utilization for the living tochi trees such as a visit tour, furthermore, promotion of upstream forest recovery project with people in downstream town, Harie in Takashima city and some events such as tour festival (Photo 2) and presentation forum were also organized.

Photo 1: Lumbering site (November 2011)

Photo 2: Tour festival (October 2012)

Table 1: Annual events from April 2012 to March 2013 of 'Kyoboku-to-suigen-no-sato-wo-mamoru-kai'

	Date: Activities			
	Research Activities	Visit tour	Forest recovery	Others
April			30: Planting saplings in Harie	
May	24			
June	11,18,27,30			
July	9,14,19,26,30	23	8: Weeding in Harie 16: Workshop on deer fence	
August	4,5,11,18,31	6,17	5: Watering in Harie 24: Workshop on animal feeding damage	
September	6,20	12		
October	27	28		6: Participation in forest forum 20-21: Festival of tochi trees
November	3	18	18: Weeding in Harie	3: Participation in local specialty festival
December	10,21			
January				12,14: Participation in biodiversity forum
February	17			
March	3			24: organizing presentation forum of tochi trees

Source: Handout of annual meeting of 2013 (May 19th, 2013 at Ikimono fureai no sato in Kutsuki),

2.5 Social framework of network-based forest management related to giant tochi trees

Conservation movement of giant tochi trees arose at the logging situation as a turning point. A director of Shiga Prefectural Ikimono-fureai-no-sato (natural education institution) has played an important role in forming and promoting a series of activities (Figure 2). Financial support based on forest taxation in Shiga prefecture for the owners and the group essentially is compulsory needed to sustain network-based forest management related to conservation of giant tochi trees. NGOs in natural conservation fields, mostly based in Otsu city, prefectural capital in Shiga, also join to this network at the aspect of human resources and finance. Many citizens from downstream Takashima city and Otsu city participate in each events and activities of forest management planned by this group.

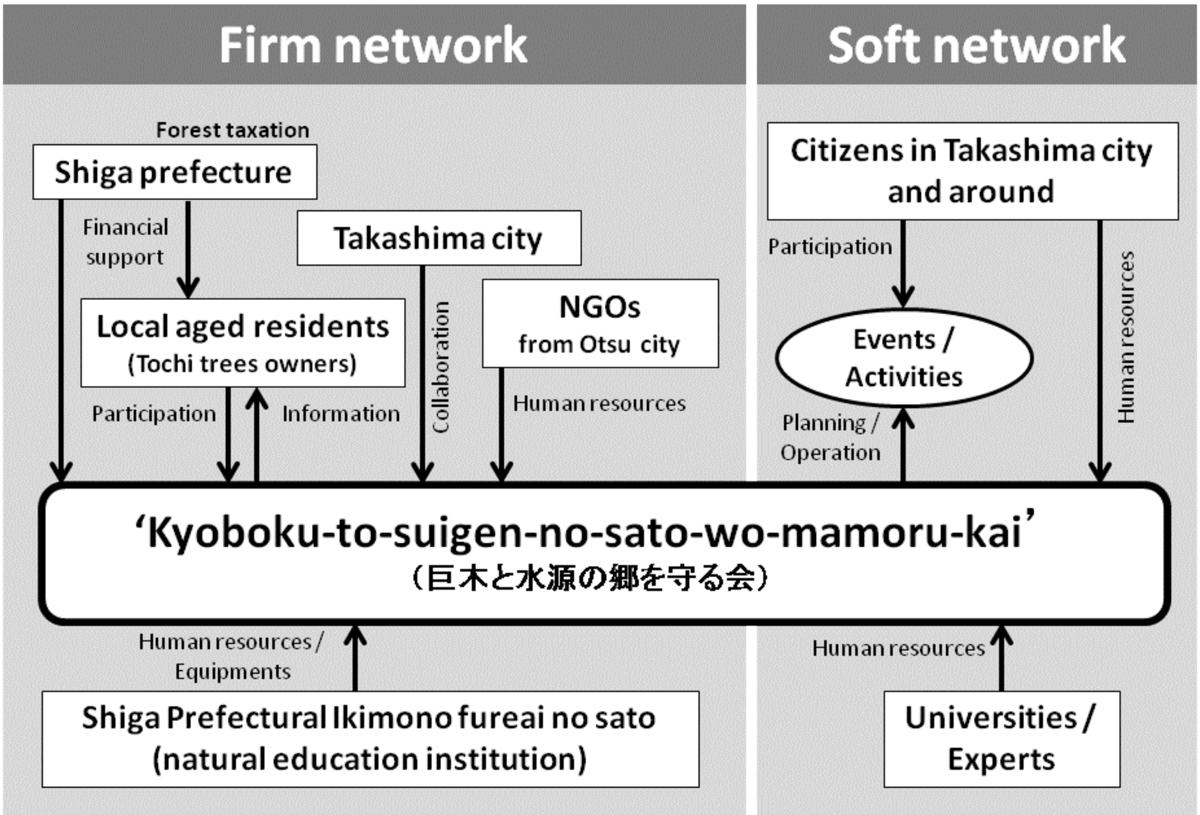

Figure 2: Social framework of network-based forest management of Kutsuki region

3 Oku-kambayashi region

3.1 Outline of the region

Oku-kambayashi region (about 74.1 km^2) belonging to Ayabe city in northern part of Kyoto prefecture is the headwater of Kambayashi river which is one of tributaries of Yura river flowing northward into the Sea of Japan. Though the population of this region in 1920s was over 2,500, it decreased to less than 700 in 2000s [3]. Depopulation in mountainous remote villages was seriously recognized. Ayabe city enacted the municipal bylaw of 'Suigen-no-sato'(villages at the source of a river), in 2007, which aimed to promote and support permanent residents and new industries in headwater villages where the number of household is less than 20, 60% of the population is over 65 age and are located apart over 25 km from the city hall [4]. 5 villages were selected under the bylaw at the first.

3.2 Situation of past forest management in a village for several decades

Koya village is one of the selected villages, where the number of household is now 5 and 5 of 6 residents are women over 80 aged, however, about 70 residents lived together about 40 years ago. Old women told that charcoal production and rice cultivating were main livelihoods and they also collected reeds for thatched roof. In 1960s, a local sold their mountain land to government and the pulp company who planted conifers after logging broad-leaved trees.

3.3 Movement related to giant tochi trees

Local specialty such as very small rice crackers and dried rice cake mixed with steaming tochi nuts after removal of harshness had been developed over 1 year from 2008 to 2009 by the aged residents in Koya village under the bylaw (Photo 3).

Photo 3: Production of tochi rice cake in Koya village (October 2011)

3.4 'Koya-de-ganbarou-kai'

'Koya-de-ganbarou-kai' which is the supporting group for the way of life in Koya village was established in February 2011 [5]. The activities of this group cover from road and pathway maintenance to snow plowing (Table2). Especially the activities related to tochi nuts are attached a great deal of importance to; for example, gathering tochi nuts fallen on the ground in September 2012 after repair of plastic nets that keep tochi nuts inside without deer consumption. At this time, the total number of volunteer participants is over 330 people and the total amount of tochi nuts gathered was about 1,100 kg in wet weight. These dried nuts were used as tochi rice cake production and some were distributed to other selected village where tochi rice cake was made for local specialty.

Table 2: Annual events from April 2012 to March 2013 of 'Koya-de-ganbarou-kai'

Date		Activities
April	21	Road maintenance, roof repair of shrine house, annual meeting
May	19	Setup of beehives and fences
June	30	Research activity on Japanese horse chestnut trees and firefly enjoyment
July	1	Research activity on Japanese horse chestnut trees
August	11	Pathway maintenance in forest for collecting nuts
	25	Repair of plastic nets that keep nuts inside without deer consumption
September	7,8,12,14,16,19,23	Gathering nuts fallen on the ground
October	25	Experience on peeling nuts and participation in Shinto rite of Kojin
November	24	Trial hiking tour around giant Japanese horse chestnut trees
December	8	Yearend party
January		
February	2	Snow plowing and snow playing
March		

Source: Handout of annual meeting of 2013 (April 20th, 2013 at Koya community house)

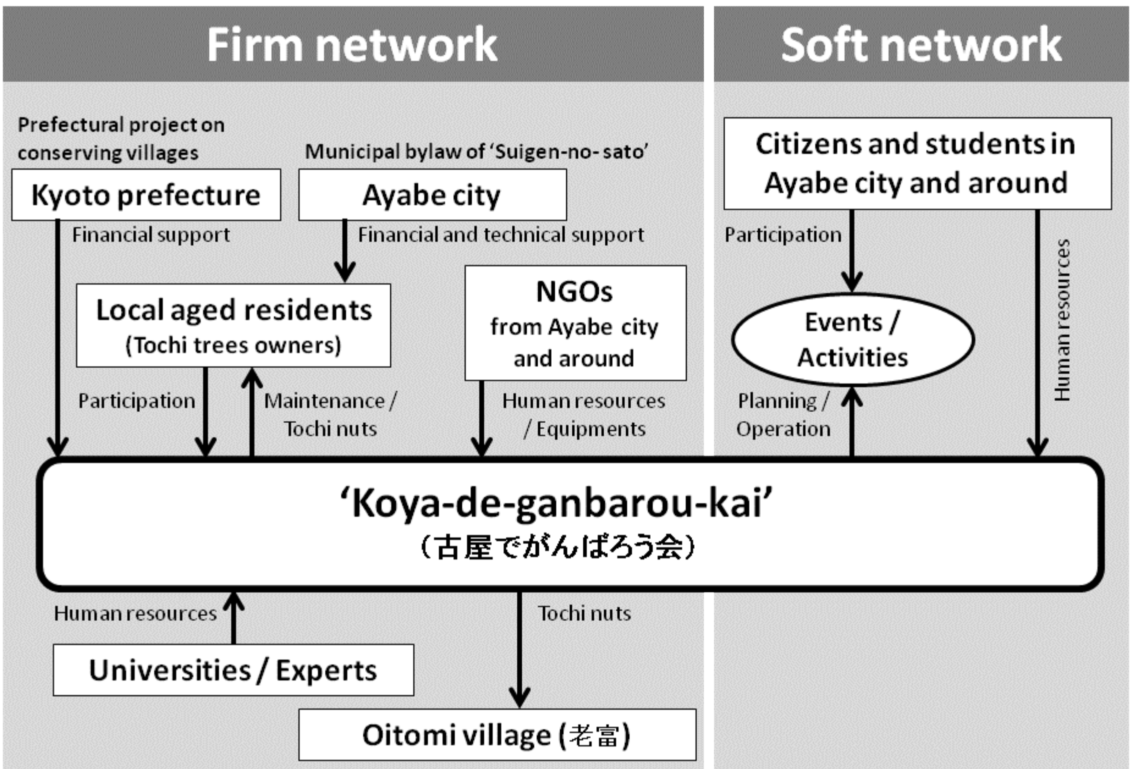

Figure 3: Social framework of network-based forest management of Oku-kambayashi region

3.5 Framework of network-based forest management related to giant tochi trees

'Koya-de-ganbarou-kai' has been managed by the collaboration work with chief of neighborhood association of Koya village and junior college teacher who is an expert of elderly welfare. Activities in Koya village are financially supported under the municipal bylaw of 'Suigen-no-sato'(villages at the source of a river) by Ayabe city and Kyoto prefectural project on conserving villages [6] (Figure 3). Voluntary citizens who participated in the activities are mostly from downstream Ayabe city and neighboring Maizuru city and many students from Kyoto city also joined in them.

4 Forest management transition: community-based to non-resident-network-based

4.1 Japanese horse chestnut tree as 'new symbol' in remote mountain regions

Both of regions has similar socio-ecological history in these several decades such as charcoal production, pulp lumbering, planting conifers like Japanese ceder, decrease of forest use after 1970s, invasion of wild animal especially deer problem in 2000s and so on. Giant tochi trees have been recognized as local precious symbols under the relationship with the non-residents in both of regions by a curious coincidence since around the end of 2000s. In Kutsuki region the lumbering giant tochi trees was critical point to promote forest management to conserve them, however, severe depopulation was also the key factor to recognize the value of tochi in Koya village of Oku-kambayashi under the municipal bylow. Therefore, the starting points focused on were different because a successful leader has various the way of thinking and the background experienced ever for example nature conservation or elderly welfare. In the point of administrative view, the kind of financial support may prescribe which direction of activity to be selected. The final target of both of groups is similar, though, to activate the quality of village life with giant tochi trees as core resource that means living tochi trees are more stressed on than tochi woods that were cut down. Some of the aged locals have understood the activity that aim to conserve a headwater forest area where they used to make use of forest resources thoroughly and to support lifestyle of village, and have positively cooperated with a group more or less.

4.2 Roles of actors in non-resident-network-based forest management

4.2.1 Firm network

The prosperity of non-resident-network-based forest management on tochi trees is clarified in two mountainous remote regions by this research. There are many actors which can be defined as 'firm network' and 'soft network' shown in Figure 2 and Figure 3. The former seems to be more administrative and more persistent, though the latter is supposed to be more temporary and more unstable. In firm network, it is obviously pointed out that there are important role of cooperation and financial support system by public sectors and coordination role of experts from university or education institution.

4.2.2 Soft network

Both of groups have better organized the exchange activities between upstream residents and downstream residents to sustainable forest management. Many downstream residents including citizens in neighbor area and students from various universities can participate in selectable activities. Mass media like broadcasting and regional newspaper seems to be much powerful actor to form 'soft network'.

4.3 Further challenges for non-resident-network-based forest management on giant tochi trees

(1) Increase of human resource in operational part of the network; needed to recruit human resource from the part of 'soft network' and to provide an opportunity to learn administrative work
(2) Necessity of future vision for next generations; needed to consider the direction for conservation system and forest recovery project in terms of influence of various disturbances on mountainous ecosystem
(3) Development and accumulation of knowledge and skills for new forest management; needed the way of thinking on verification and obvious procedures
(4) Suggestion of alternative solution on fundamental problem such as depopulation/aged society and wild animal management; needed to tightly collaborate with university and public sectors in 'firm network'
(5) Establishment of coordination system with land owners and afforestation public corporation; needed to share forest management information in terms of not only forestry but also ecosystem conservation
(6) Exchange of human resource and information over prefectural boundaries; needed to penetrate an idea of unified ecological-cultural Tamba Highland into 'firm network' and 'soft network'

5 Conclusions

Non-resident-network-based forest management on giant tochi trees is exhibited from two regions in this study. Living giant tochi trees have been recognized as new symbol to sustain the way of village lifestyle. The forest management is necessary to be reformed to adopted system to conserve giant tochi trees and surrounded mountainous ecosystem in the headwater regions. Further discussions on the roles of non-resident in mountainous forest management are required to sustainably inherit forest resources and ecosystem services.

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[PS09]

Can self-employed forestry households be leaders?

- A case study of forestry household groups in Shizuoka prefecture -

Katsuhisa Kohroki[1] and Akie Kawasaki[2]

Abstract

Forest Agency has promoted forest management and operation commissions to forestry companies or forest owners' co-operatives more than self-employed operation since 2000s. In opposition, 30% of total logging volume in Japan were still logged by forest owners their selves, according to 2010 forestry census. Moreover, forest owners have established forest owners' groups for their forestry operation with the support from local government in Shizuoka prefecture, where renowned for multiple managements of forestry and green tea production by small scale forest owners. Therefore, forest owners' groups and the members in Shizuoka pref. were interviewed during 2000-2013 to clarify the background and condition of owners' management. As the result, the owners' groups were classified to two type from the characteristic of members; one is group are consist mainly self-employed private forest owners, the others the members are full-time forest workers who operate their own forest, logging contractors, forest owners co-operatives and private forest owners who manage multiple work. The members are mainly 40's, small-scale owners about 10ha or middle-scale owners 100-200ha. Logging are operated with chainsaw, mini-forwarders and small grapple, the members share those machineries among their groups. Some of owners' groups are entrusted with forest operation from other owners, and the members' forest are certify from SGEC domestic forest certification in Japan.

1 Background, objective and method of study

After World War II, in order to meet the increasing demands for construction timber, and also partly because of the decreasing demands for community-based broad leaf forest (natural regeneration) due to energy revolution (changeover from wood-and-charcoal based fuel to fossil fuel) as background, our county had promoted the changeover from native forest to artificial forest as our national policy (expansive afforestation policy).

The initial expansive afforestation was conducted by forest holding farm households. And then from 1950s to 1970s, they were raised through the establishment of farm forestry etc., wherein needs for positioning them as bearers for silviculture were actively debated. In 1980s, in accordance with the growth of the trees from the post-war expansive afforestation, the movement of logging and carrying out by family labor with use of small forestry machines was often seen (Sato & Kohroki 2006).

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Then, as depopulation and aging go on, it has been pointed out that the mind-set towards forestry management by the individuals (forestry households) who live in mountain villages and own their forest has been generally declining (Sakai *et al.* 2003). In addition, the national policy has been changed over from the direction of promoting forest improvement through raising forestry households to the direction of raising the forestry service establishments which are entrusted with forestry work and management from forestry households, due to the establishment of the Forest and Forestry Basic Act and the amendment to the Forest Act in 2001 (Kohroki 2010).

However, it has been found in statistics that about 20 to 30% of silviculture and log production are still conducted by the forest owners (mainly including forestry households) by themselves (Fujikake 2009). For example, Table 1 shows that the production from the forest lands owned by forestry households accounts for 23% among the total log production in 2010.

Table 1: Log production by forestry management bodies (2010)

Unit: 1,000m3, %

Type	Forest owner	Forestry services establishment etc.				Total
	Owned forest	Owned forest	Contract	Standing trees buying	Total	
Total	3,570	1,135	5,583	5,333	12,051	15,621
(share %)	22.9%	7.3%	35.7%	34.1%	77.1%	100.0%
Company	762	509	2,587	2,947	6,043	6,805
Forestry cooperative	0	158	1,917	1,143	3,217	3,217
Private enterprise	2,061	355	919	934	2,208	4,269
Others	747	113	160	309	583	1,330

Source: 2010 Census of Agriculture and Forestry.

Although the operational sustainability of forestry households that live in mountain villages is largely affected by whether or not the farm forestry has been established for them, Shizuoka prefecture where the foundation of farm forestry is relatively stable due to active tea production holds a relatively large number of forestry households = self-employed forestry households that conduct log production by family labor, and their increasing group activities after the late 1990s are drawing our attention (Kohroki 2004).

Among the earlier studies that address the movement of the self-employed forestry household groups in Shizuoka prefecture, one representative study highlights their operational status from two viewpoints: improvement in productivity by introducing small machines, and operational sustainability such as generational succession (Kohroki 2003). However, there are barely any studies from the third viewpoint "socialized forest management", except for one study mentioning that some groups are trying to obtain the forest management certification (Kohroki 2010).

This study will provide a comprehensive assessment of the self-employed forestry household groups in Shizuoka prefecture from these three viewpoints. The materials of the study consist of results from the interviews with six forestry household groups in Shizuoka prefecture ("Tenryu Foresters 21"= TF21, "H_2O Forestry Group"= HFG, "Union Art Forestry"= UAF, "Operate Umegashima"= OUM, "The Sectional Meeting of

Forest Management Certification, Shizuoka Forestry Households Club"= SFHC, and "Bunzawa Sorinsya"= BUS), wherein the interviews were held from time to time between 2002 and 2013.

2 Movement and characteristics of the self-employed forestry household groups in Shizuoka prefecture

The author conducted a survey for the self-employed forestry household groups in Tenryu-ku, Hamamatsu City in 2002 and positioned the self-employed forestry household groups as underlying supports for cost reduction of individual forestry management (Kohroki 2004). The term, "low cost forestry" aims to secure the farm income (forestry income + unpaid family labor wage) by changing over to the long rotation forestry/commercial thinning-oriented operation, attempting the introduction of high density network of forest trails and light vehicle-type forestry machines (see Picture 1: Light grapple and Picture 2: Light logging truck), and making the most of family labor. This has been promoted by Shizuoka prefecture since it is considered to be particularly effective in Shizuoka prefecture where the wage rate for forestry is relatively high (Shizuoka prefecture 2000). Therefore, as the assistance measures for the introduction of machinery to support the movement, they are taking advantage of the subsidy for forestry (Shizuoka prefecture) and the forest environmental tax (Shizuoka prefecture), which have been implemented for many years since 1997.

Picture 1: Grapple with winch (bucket capacity 0.16m3)

Picture 2: Light logging truck (loading capacity 1t)

Fig. 1 shows a distribution map of self-employed forestry household groups inside Shizuoka prefecture at present. The characteristics of these groups are summarized as follows (Kohroki 2010):

(1) One or two additional groups had been established each year intensively from the late 1990s to the early 2000s, and these groups are concentrated in Tenryu-ku in Hamamatsu City and Kawanehoncho in Shizuoka City.

(2) Some groups (Tenryu Foresters 21 and H2O Forestry Group, etc.) are composed of 5 to 10 people, wherein most of the members are self-employed forestry households. Whereas some other groups have a core member such as a full time forestry household, forestry household that operates log production, or forestry cooperative, around which local forestry households are gathered.

(3) The area of the project estate (total of forest areas owned by members) is around 200 to 300 ha (mostly around 10 ha or up to a range of 100-200 ha per person).

(4) Many of the members are in their 40s who are the next generation of the people born in the first decade of the Showa period (between 1925 and 1935) who had conducted the expansive afforestation after World War 2, and are highly evaluated in terms of the sustainability of forestry households (operational succession to the next generation).

(5) Most of the groups were established for the purpose of sharing forestry machines. Although self-propelled carriages were mainly introduced in the beginning, light vehicle-type forestry machines such as a light logging truck, light swing yarder, grapple, and light backhoe, etc. are more common at present. Three groups established after the late 2000s in Shizuoka City and Kawanehoncho have been set up for joint operation on the forest management certification and forest management planning.

(6) Regarding the 15 groups of forestry households established up until the fiscal year 2002, the self-pay burden accounts for 20 to 30% of the operating cost and is an average of 5,070,000 Yen, which is 870,000 Yen per member on average. The benefits of sharing machines are to be able to make use of forestry machines that have so far remained unused, to implement risk-control that is increasingly needed under reduced timber values, and to address the diversified machinery investment. From these viewpoints, it is a realistic amount of money for forestry households to easily attempt to introduce small machines.

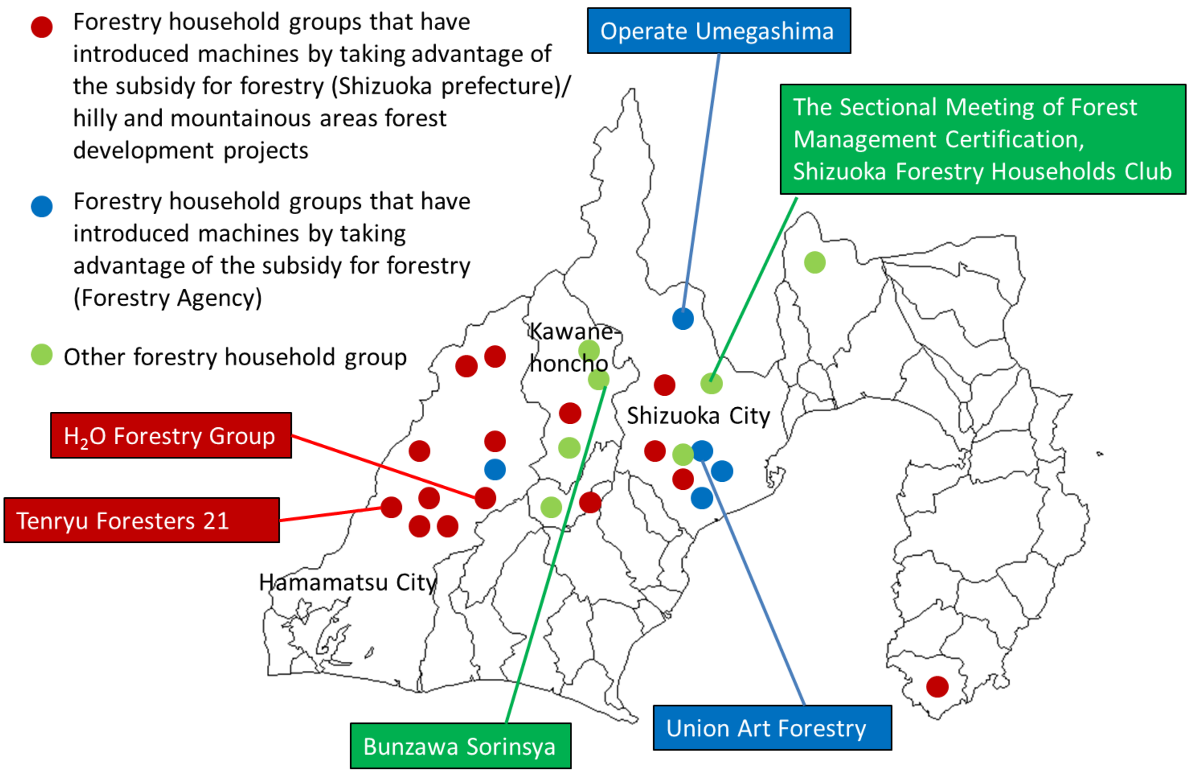

Fig. 1: Distribution of self-employed forestry household groups in Shizuoka prefecture (2013)

3 Comprehensive assessment of the self-employed forestry household groups for sharing forestry machines

A hearing survey was conducted for the representatives of four self-employed forestry household groups that were established in 2007 for the purpose of sharing forestry machines. The details of each group are shown in Table 2. The group activities of these groups have been comprehensively assessed from the three viewpoints of productivity, operational sustainability and socialized forest management, and the results are as follows (Kohroki 2010):

Table 2: Self-employed forestry household groups for sharing forestry machines

Town (village) name		Aoi-ku, Shizuoka City		Tenryu-ku, Hamamatsu City	
Group name		Union Art Forestry	Operate Umegashima	H_2O Forestry Group	Tenryu Foresters 21
Established in		1993	1992	FY 1999	1998
Parent body		5 intimate members in a forestry household group	Cooperation entity for Wasabi joint management	Full-time forestry households among the forestry households club members	Members who live in Kunma and Kamiatago among the forestry households club members
Background		Subsidy for forestry (Forestry Agency)	Subsidy for forestry (Forestry Agency)	Subsidy for forestry (Shizuoka prefecture)	Subsidy for forestry (Shizuoka prefecture)
Owned machines (qty.)		0.15m3 backhoe (1), 0.25m3 backhoe (1), 0.25m3 grapple with winch (2), 3.3t forwarder (1), vehicle-type forestry machines (2)	0.25m3 grapple (1), 0.45m3 grapple (1), Monorail for riding, 7t crane-equipped truck (1)	0.25m3 backhoe with winch(1), 0.16m3 grapple, backhoe with winch (2), 2t light logging truck (1)	0.09m3 backhoe(1), 1.2t backhoe (1), Winch&crane-equipped 1m3 light logging truck (5), winch-equipped 1.5m3 light logging truck (5), small self-propelled carriage (3)
Summary of members	Number	5	5	5	10
	Age	45 to 70	39 to 75	48 to 56	46 to 70
	Occupation etc.	Self-employed forestry households (4) (log, tea, shiitake mushroom), woodman (1)	Log production(1), agriculture&forestry (1), agriculture (tea, wasabi) (1), agriculture/pension (2)	Self-employed agriculture&forestry households (4), part-time forestry houshold (day-to-day duty) (1)	All members are self-employed agriculture&forestry households (log, illicium, tee, shiitake mushroom)
	Owned forest	130-200ha	0ha (2), 50ha (2), 258ha (1)	50-170ha	20-77ha
Purposes of group activities		Machine sharing Opening forest roads No group working	Machine sharing Joint management for wasabi farm No group working for forestry	Machine sharing Opening forest roads No group working	Machine sharing Opening forest roads Study group/visit places No group working

Source: prepared based on the results of hearing survey for each group (2007).

(1) In terms of productivity. Since 1990s, standing trees buying and consignment logging have been superseded by logging by unpaid family labor, and the operations have been conducted by one person or family members with use of light vehicle-type forestry machines, or self-propelled carriages or grapple (Operate Umegashima has one worker from family and two employed workers). As described above, a realistic mechanization investment level has been achieved by the subsidy for forestry (Shizuoka prefecture), and at the same time, the portion of unpaid family labor wage has also been secured as an income through logging by unpaid family labor. Characteristically the operation has been shifted from the short rotation forestry to the long rotation forestry/commercial thinning. It is

not oriented to joint management or group work. It is rather considered to be working on sharing forestry machines as underlying supports for individual management.

(2) In terms of operational sustainability. Many of the members are in their 40s to 50s, where generational changeover has been achieved. Since the farm forestry for wood and tea has been established, the operating foundation is relatively stable.

(3) In terms of socialized forest management. Although there is no movement of groups to take contract works from other forest owners, some personal activities were observed among the members. Mr. S, the leader of Operate Umegashima has been entrusted with the management work for the forest lands of local residents (total of 250 ha) apart from his privately owned land 258 ha, and is conducting routine runs and coordination of forest practices as part of the services. Mr. S is 39 years old and is acquainted with the local forest boundary lines. In addition, the leaders of two groups in Shizuoka City are also members of the Sectional Meeting of Forest Management Certification, Shizuoka Forestry Households Club, and the SGEC=domestic forest certification, Sustainable Green Ecosystem Council has been jointly obtained as the activity of six members from the club.

4 Self-employed forestry household groups as bearers for socialized forest management - Bunzawa Sorinsya –

Bunzawa Sorinsya is an organization established in 2012 to manage the local forest lands in the Bunzawa area (six households) in Kawanehoncho. Three of the six households living in the area are medium-scale self-employed forestry households (one in 40s and two in 50s). The total of approx. 400 ha composed of the forest lands owned by the six households and the Bunzawa common forest (currently rented out to the prefecture as a profit sharing forest) is managed by the group work of thee members. It was acknowledged as a forest management plan in 2012. Bunzawa Sorinsya is not a solo group. Characteristically, it has a deep relationship with various associated self-employed forestry household groups, government and forestry cooperatives.

The leader, Mr. S established "Woodcraft Nakakawane" = WCN as a self-employed forestry household group for the purpose of group-purchasing of machines in 1996. However, the activities of Woodcraft have wound down for a while after Mr. S was elected as the town mayor. In 2008, Kawanehoncho started to work on the FSC (Forest Stewardship Council, international forest) certification and established "F-net Oigawa" = FNO for the purpose of acquiring the certification in the same year. This is also a self-employed forestry household group and many of the members are also the members of Woodcraft. The forest owned by Kawanehoncho has also taken part of this. This has allowed the reduction of personal expense for the certification costs. Afterwards, Mr. S and Mr. Y, the core members of F-net have established separate self-employed forestry household groups respectively in 2012.

One of them is "Bunzawa Sorinsya", and the other one is "Meirinkai" established by Mr. Y who is also the president of the forestry cooperative. Unlike other self-employed forestry household groups in the prefecture, these two groups have been established to single-handedly undertake the management of local forest lands within the village region where the group is located. Bunzawa Sorinsya in particular is managed by the group work of three members. Meirinkai is run by Mr. Y and three others employed by Mr. Y and is planning to embark on the joint preparation for forest management plan with the forest owners within the village in the future.

Bunzawa Sorinsya uses machines (grapple and crane-equipped truck etc.) from Woodcraft and privately owned yarders, and produces log (mainly thinned wood) of approx. 400m^3 per year. The productivity is 3m^3 per person/day, which not so high. Therefore, you may say that the operation aims at cost reduction through logging by unpaid family labor just like other self-employed forestry household groups do. However, totally different from other groups, it tackles not only machine sharing but also forest management planning and joint operation of silviculture. In addition, it also single-handedly undertakes the management of forest lands within the village region in cooperation with government. In contrast to other groups, which stay in their positions to support individual management, it draws our attention that Bunzawa Sorinsya aims at group forestry and socialized forest management. Although there are still challenges to improve productivity and to secure the profit by enforcing the sales strength through supplying forest-management-certified log, the self-employed forestry household groups of these types are the ones that should be positioned in the national policy as bearers for the Japanese forestry.

Table 3: Self-employed forestry household groups that are associated with Bunzawa Sorinsya

Name	tablished	Member	Activities	Characteristics of group
Woodcraft Nakakawane	1996	Farm forestry (7)	− Group purchase and sharing of forestry machines by taking advantage of subsidiary aid from prefecture − Currently used by Bunzawa Sorinsya − No joint forest management planning or group work	Group purchase and sharing of machines
F−net Oigawa	2008	Farm forestry (9) + town forest	− Members from Woodcraft − Established for acquiring FSC certification − No joint forest management planning or group work	Cooperation to acquire the forest certification
Bunzawa Sorinsya	2012	Farm forestry (3) + profit sharing forest managed by prefecture (Bunzawa common forest)	− Leaders are the former town mayor, vice−president of forestry cooperative, members of Woodcraft and F−net − All 3 are F−net members − 3 self−employed forestry households jointly provide management and prepare for forest management plan for the local forest lands within the area for 6 people in the Bunzawa area − Contract works of silviculture for other areas are under cosideration	Joint forest management planning Group silviculture
Meirinkai	2012	Farm forestry (1) + aged forest owners (4)	− The leader is a F−net member who is the president of forestry cooperative − At present mainly conducting silviculture for the forest of the leader S's household and subcontract from forestry cooperative − Planning to undertake silviculture contracts/forest management planning for the members in the future	Joint forest management planning (planned) Forestry contractor

Source: Prepared based on a hearing survey (July 2013).

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[PS10]

New Challenges of Forest Management and High-Quality Timber Production by Buddhist Temples in Kyoto

Keito Mineo[1] and Koji Matsusita[2]

1 Introduction

In Japan, forestry has been facing difficulties because of many problems, including the decline of mountain villages, the delay of thinning and other essential operations, labor aging, and the extinction of local knowledge. Traditional wooden buildings in Japan—such as Buddhist temples, Shinto shrines, and castles—require long, thick, and high-quality timber, but obtaining such timber is becoming more difficult due to the decrease in virgin forests worldwide and the depression of the forestry industry in Japan (Mineo, 2013).

In the midst of such difficulties, two Buddhist temples in Kyoto have obtained forestland and established a forest management regime: Kiyomizudera Temple, which started the long-term management of softwood and the planting of keyaki (*Zelkowa serrata*; not previously considered a major forest species), and Sanzen-in Temple, which purchased forestland nearby and also established a forest management regime.

Historically, the area of forestland dominated by temples and shrines has been decreasing by political reasons, although they once owned substantial areas of forest, obtaining timber and other forest products (Ministry of Finance Japan, 1954: 5-112). These two Buddhist temples have initiated new projects, making new relationships between the temples and the forest.

The data regarding Kiyomizudera Temple were collected during an oral survey of the monks and a forest worker who manages the temple's forestland in Hanase. The data regarding Sanzen-in temple were collected during an oral survey of its monks. Supporting information was collected through a bibliographic survey.

The aim of this study was to record these developments and the opportunities they provide. This paper consists of six sections, with the first being an introduction. The second section considers general issues regarding the history between the temples and forest, based mainly on a report by the Office Management Division of the Ministry of Finance, Japan (1954). Sections three and four are case studies, and Section five is a discussion integrating the case studies. Finally, conclusions are presented in Section six.

2 History of Buddhist temples and shrine–forest relationships in Japan

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Buddhist temples and Shinto shrines in Japan acted as manorial lords until the Middle Ages(i). Powerful Buddhist temples were concentrated in Kyoto, the capital city. They held manors containing farms or mountains around Japan and obtained funds and timber for running or repairing the temples from these lands.

However, all of the manors were eventually confiscated, and pieces of land around temples and shrines were seized again by Toyotomi and Tokugawa around 1600 A.D. Thus, their territories were substantially reduced.

The Meiji government absorbed most of the forests still belonging to temples and shrine forests into the national forest when it modernized Japan, and therefore, the temples and shrines lost all of their remaining forestland (ii). Although government later returned sections of forest on several occasions, the area returned was usually much smaller than before. For example, Kiyomizudera Temple held a 55-ha forestland surrounding the temple before the seizure, but now its territory is limited to 13 ha. In this way, the forest area owned by temples has decreased.

Although most of the forestland in Kyoto originally owned by temples and shrines remains within the national forest, a few temples have had considerable parts of their forestland returned. Ise-jingu Shrine in Mie Prefecture owns 5500 ha, Enryakuji Temple in Shiga Prefecture owns 1700 ha, Kongobuji Temple in Wakayama Prefecture retains 2000 ha, and Kuonji Temple in Yamanashi Prefecture owns 950 ha. These temples are located in mountainous areas, whereas most temples in Japan are located in urban areas.

3 Case study of Kiyomizudera Temple

3.1 Description

Kiyomizudera Temple was established in 778 and is one of the oldest temples in Kyoto. It has been supported by nobles, samurais, and people in Kyoto and around Japan. Its buildings were donated by Tokugawa Iemitsu, the third shogun of the Tokugawa shogunate (Heibon-sha. 1997: 200–212). It was registered on the UNESCO World Cultural Heritage List in 1999, and is one of the most popular sites in Kyoto, with about 5,000,000 visitors annually.

Kiyomizudera Temple decided to establish a timber production project in 2000, when its most important memorial event “*gokaicho*” (a special exhibition of secret statue of Buddha) was held after an interval of 32 years. This project is attempting to produce timber over a span of 400 years, in preparation for the end of lifetime of its existing buildings.

Table 1: The Kiyomizudera Temple Forests

	Hanase	Keihoku	Maizuru
Area	12 ha	30 ha	2 ha
Planted rate(age)	1 ha *sugi* (30–40 years old) 1.3 ha hinoki (30–70 years old) 1.8 ha keyaki (3 years old)	(No data)	1 ha hinoki (30–40 years old)

Source: Produced by the author from researched materials.

The temple searched for a forest to use for the project within Kyoto Prefecture rather than in more famous forestry centers in other areas, preferring the local climate and natural features(iii). The temple now owns forestland in three areas in Hanase, Keihoku, and Maizuru (see Table 1).

3.2 Forest management

Long-term management of *hinoki* (Japanese cypress, *Chamaecyparis obtusa*), which is considered the best species to use as a building material, was undertaken in these three Kiyomizudera Temple forests. Horyuji Temple, which is the oldest wooden building in the world, and Ise-jingu Shrine, which is renowned for rebuilding all of its buildings every 20 years, were also built with this timber as well as Kiyomizudera temple. Its bark is used as a traditional roof covering material. Japanese cypress is the second-most popular forestry species, and comprises 25% of the planted forest in Japan.

The forest at Hanase has received special attention, not only for tackling the long-term management of *hinoki* but also for afforesting with *keyaki*. The operations are trusted to an individual from a local forest household.

The worst problem experienced at Hanase is damage by deer, which is becoming a serious problem in all regions of Japan. Deer damage young buds and bark, causing decreasing tree numbers, distorted trees, insufficient growth, and ultimately the death of planted trees. A young *keyaki* tree is very easily damaged and can be killed by deer.

Another problem for *keyaki* is the supply and quality of planting stock, which forest workers obtain from three locations because no one trader can provide a sufficiently large order, and also to increase genetic diversity. Furthermore, two of the three suppliers have proven to be unreliable.

The lack of a silvicultural system for *keyaki* is also a major problem. Studies on Japanese silviculture are strongly biased toward softwood. The forest manager attempted to gather information with the cooperation of officials and planting stock traders, but little practical information could be obtained.

Although the construction of a silvicultural system for long-term management over centuries and the production of large and high-quality timber are not easy, to protect cultural assets some timber will inevitably be produced by planting, due to the decrease in virgin forest worldwide. This fact should be recognized and tackled as early as possible.

3.3 Evaluation and characteristics of the new challenges

Kiyomizudera Temple is concerned that only temples and shrines may be able to undertake forest management for periods of many centuries, as the depression in the forestry industry has been prolonged and societal changes occur frequently. However, it considers timber production costs too high for most temples and shrines to arrange and undertake effective forest management by themselves, and recognizes its role as a pioneer.

The most important goal of the project is to produce large-dimensional and high-quality timber for its own needs, but it is also attempting to develop cultural assets through the production of large-dimensional timber and intends to distribute some of the harvested timber and materials to other temples and shrines rather than sending them to the market.

Repair works are currently being undertaken at Kiyomizudera Temple, and the main hall—*hondo* with famous *butai* (stage)—will be established in several years' time. Kiyomizudera plans to provide visitors with details of the construction work and encourage them to learn about the temple's history and its association with the forest.

Currently, social attitudes toward the production of large-dimensional and high-quality timber are developing positively due to special repair works of Ise-jingu shrine, and the contribution of some researchers and nongovernmental organizations (Forestry Agency, 2013), but it is remarkable that Kiyomizudera Temple began their plans at such an early stage in the public acceptance process. Furthermore, they established their forestland within Kyoto Prefecture, among well-established production centers. Further studies are required to create a silvicultural system for the long-term management and planting of *keyaki*.

4 Case study of Sanzen-in Temple

4.1 Description

Sanzen-in Temple, belonging to the Tendai sect, was established around 800 A.D., and is one of only a few temples whose head priests used to be members of the imperial family (iv).(Heibon-sha, 1997; 299–302). It is now the focal point of the Ohara area, a mountain village located 20 km northeast of Kyoto station, and receives about 500,000 visitors per year. Until the energy revolution, the Ohara area provided charcoal to the Kyoto City region. A stone statue of Buddha named the "Baitan-Okina" ("charcoal-selling old man") is located in Sanzen-in Temple's garden and was revered by the local people who worked in the charcoal industry.

Sanzen-in Temple was concerned about the ruin of the forest that was occurring as a result of the depression in the forestry industry and had challenged forest conservation policy before this project. Following the spread of pine wilt disease and the death of many pine trees around 2000, it briefly tried planting wild cherry blossoms to conserve the forest environment and improve the scenery. They currently raise donations from adherents and plant stocks of flowering cherry and maples in the forest around the temple.

Table 2: The Sanzen-in Temple Forest

Area	About 70 ha (divided 15 ha and 55 ha)
Planted rate	About 70% (*sugi* and *hinoki*)
Age	17–50 years
Road system	(No data, now constructing)

Source: Produced by the author from researched materials.

In 2010, a local forest owner made an offer to sell surrounding forestland to Sanzen-in Temple; the temple bought 70 ha, located approximately 1–3 km from Sanzen-in's ground. In this way, the temple established the reconstruction of forest management in the area in 2011.

4.2 Forest management

Initially, the temple compiled a land register and then started to consolidate the forestland with other owners' land to receive operational subsidies according to revised Forest Law (v).These processes were difficult because all of the forests were private and divided into small areas under different ownership. Some forest owners knew very little about their forest, and some had moved to remote area. To overcome these difficulties, they had to cooperate with local elders. Such problems concerning forest ownership are common in Japanese forestry, but the temple's actions eased the difficulties in this particular case.

The forest is divided into two sections, of 15 ha and 55 ha, and forest operations started in the smaller one. The temple purchased four chainsaws, a forwarder, a backhoe, a yarder, and a large wood chipper. It took the initiative in forest management by cooperating with the local forest owners' cooperative. It organized a team of seven members (both monks and non-monk workers) and arranged forest operations. The main operations are thinning and the development of a road system.

They harvest all timber under a policy that they must utilize everything obtained from the forest. Thinned timber is utilized for posts that surround Sanzen-in's land (See Figure 1), firewood, or is chipped and composted.

Figure 1: Posts around Sanzen-in Temple Made from the Thinned Timber
Source: Author Took 12/7/2013

A road system development plan is being designed for the forest that will enable anyone with machinery skill to harvest timber. Forest roads (4 m wide) are being established at a high density. Maximum attention is being given to planning the roads, as the forestland is steep and collapses easily.

Further unique points of the forest plan are incorporation of local elders' knowledge, and zoning to fulfill multifunctional roles. During road development or zoning, forest and soil conditions and geographical features are examined with local elders who have substantial knowledge of the Ohara Mountains. Zoning is arranged to allow slopes along national roads to be zoned as scenic areas, where wild cherry blossoms and Japanese maple are planted, whereas on forestland where conditions are appropriate for long-term management, *hinoki* forest (for harvesting bark) and *keyaki* plantation areas are being established.

The harvested timber will be used by Sanzen-in and other temples and shrines rather than being sent to market. Sanzen-in is planning to build a new hall using timber harvested from the temple forest. Although no current buildings use *keyaki* timber or a *hinoki*-bark roof, they consider that the silvicultural practices of growing and harvesting local trees will protect cultural assets.

4.3 Evaluation and characteristics of the new challenge

Sanzen-in Temple has been concerned about the depression in the forestry industry and the degradation of forests not only from the perspective of the forestry industry or timber production but also with regard to the conservation of mountains as a source of water, the inheritance of the Japanese "wood and paper" culture, the basis for rich spirituality, and the inheritance of a Japanese culture based on rice cultivation, which relies on forest and water resources.

They believe that before the energy revolution, forests were conserved by local residents through their daily life, but the subsequent disappearance of demand for fuelwood and the expansion of demand for timber negatively affected local residents' eco-friendly lifestyle, resulting in the felling of hardwood trees and the planting of softwood trees in vulnerable areas, causing landslides. The depression of the timber price then made the problem much worse, and due to a lack of thinning and pruning most forestland in Ohara appeared to be unhealthy after the 1990s. Sanzen-in Temple was concerned that this represented a crisis not only for the forest but also for the water supply and traditional culture.

In a free economic system, and with the progress of globalization, regions have lost their local features. Imported forest and farm products from other countries have become cheaper than local ones. In the midst of this conflict, Sanzen-in intends to take action to conserve local resources by utilizing the local forest.

Traditionally, Japanese people customary respect the sun, mountains, trees, and grass. In addition, the Tendai sect has "Hongaku Shiso", the doctrine of original enlightenment, which teaches that "even matter without spirit, like grass, trees, mountains and rivers, has attainment of Buddha-nature." With such ideal background, Sanzen-in Temple intends to use forest and harvested timber as "precious organic material" rather than as mere "inorganic material that we can obtain at any time."

Sanzen-in Temple has improved forest management to conserve traditional culture and water resources. The monks say of the future, "We will never see the results of our efforts because we will all die before they bear fruit. So we are always at the start line."

The project at Sanzen-in Temple has focused attention on timber supply and comprehensive forest management as a result of members of the temple using local wisdom and promoting the concepts that "forest and timber are not mere inorganic matter but are precious organic materials" and that one should "conserve forest to conserve water resources and traditional culture." While this project is still in an early phase, its progress has been established.

5 Discussion

The challenges faced by the Kiyomizudera and Sanzen-in temples share certain similarities in that they have obtained forestland and established a forest management regime. However, their characteristics differ as Kiyomizudera Temple has placed an emphasis on large-dimensional and high-quality timber production, whereas Sanzen-in Temple fulfills multiple roles. This can be explained by Kiyomizudera Temple being located in an urban area with huge wooden buildings, whereas Sanzen-in Temple is in a mountainous area and is relatively small. These two temples share the background of the depression in the forestry industry, but their different standpoints have ensured different approaches. Kiyomizudera Temple's project, which is suitable for an urban temple with huge buildings, has established timber production in relatively remote forest areas, whereas the mountain temple, Sanzen-in, started re-construction of forest management in local forest because of concerns regarding forest degradation.

A similarity of the two projects is that the temples are both planning to consume timber from their forests themselves and to distribute timber among other temples and shrines, rather than sending the timber to market. This is in contrast with conventional forest management by temples such as Enryakuji temple and Kongobuji temple, which until recently have attempted to improve their local scenery and to receive the economic benefits of timber production. With the depression in the price of timber and the difficulty in obtaining large-dimensional timber, the goal of forest management by temples seems to be changing (Enryakuji Temple has started production of large-dimensional timber for its own use in recent years).

Obtaining large-dimensional, high-quality timber is difficult, which is a particular problem for temples that have large wooden buildings. Timber production by Buddhist temples is expected to increase if they recognize this situation.

Following the rapid changes in society and the depression in the forestry industry, as acknowledged by Kiyomizudera Temple, and the conflicts resulting from the progress of globalization that affect traditional local communities and their economy, as noted by Sanzen-in Temple, temples and shrines have the potential to reconstruct local forest management due to their religious voluntary spirit, persistence, and roles as centers or leaders of the local community, as well as their need for large and high-quality timber.

However, Kiyomizudera and Sanzen-in temples are unusual as they have tourism resources and relatively large budgets. One cannot assume that monks and temples in other locations will be able to initiate large-dimensional timber production and forest management in the same manner. In addition, temples and shrines are facing difficulties due to changes in social practices and people's attitudes. The huge cost of obtaining forestland and establishing a forest management regime is a great barrier, with no guarantee of income from forestry activities.

6 Conclusion

Due to the depression in the forestry industry and the difficulty in obtaining the timber they need, temples and shrines have the potential to become involved in forest management for cultural reasons. More comprehensive consideration of how to improve the relationship between temples and shrines and forestland is necessary. Kiyomizudera Temple and Sanzen-in Temple have focused attention on this issue as pioneers of a new relationship.

Acknowledgment

I am deeply grateful to all who have cooperated in this study for their assistance with research and discussions. All remaining errors are solely my responsibility.

Notes

i) A Japanese manor is called a "shoen"; they existed from the eighth century A.D., with a large increase in the tenth and eleventh centuries. Nobles, local temples, and shrines often donated their manors to powerful temples and shrines in their name. From the end of the twelfth century, samurai started invading the manors, and the shoen system was abolished by Hideyoshi and Tokugawa around 1600 A.D.

ii) The seizure was so violent that government used the term "out of roof" for forest seizure and confiscation. This seizure was called a hikisaki-agechi (ripper seizure).

iii) In Japanese, the phrase "kiko-huudo" is used. This has a meaning similar to climate and some other natural features when directly translated, but it contains emotional meaning.

iv) Members of the Imperial family or nobles often entered powerful temples and shrines called "monzeki" until the Edo period in Japan.

v) The policy of forest law changed in 2011, giving operational subsidies only to consolidated forest areas over 50 ha.

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[PS11]

Comparative study of modern forest policies in Japan and Finland

A perspective as peripheral regions

Nobuyuki Yamamoto[1]

1 Introduction

Nowadays, the Finnish forest sector attracts considerable attention in Japan, especially as concern is increasing regarding the progress of forestry-related mechanization and the forestry service's extension system. However, we should be prudent about directly applying Finland's positive results to Japan. The reason is that any regional society has an indigenous history, culture and natural environment, and any economy, technology and institution is viable on indigenous platforms.

For example, the difference in complicated forest management systems is an important topic. The forest owners' organization in Finland is called Metsänhoitoyhdisty (MHY) and Metsä Forest and in Japan, Shinrin-kumiai. This means there is not only a difference in name, but also an inherent difference based on indigenous society. Although the two countries have a similar forest ownership structure with many small-scale family forest owners, various stakeholders are restrained owing to indigenous history. This point is critical when considering regulations and subsidies by government.

Based on the above recognition, this study discusses and compares modern forestry policies in Finland and Japan. Specifically, I will try to compare them through chronicle-like accounts.

2 Finland and Japan as peripheral regions of forest development

Historically both Finland and Japan were peripheral regions in forest sector development. That is to say, the forest sectors in these countries have been greatly influenced by Germany, the world-leader in forestry-related knowledge. Forestry, the forest industry and forest policies in both countries were also established from the mid-19th century influenced by the German system.

As discussed in detail later, the modern development of forest policies and economies in both countries has a lot in common. We can give various examples. There were a lot of conflicts between the forest authorities and the farmers, when the authorities introduced the German system as the selection system for their respective countries. (Ushiomi; 1964, Funakoshi; 1988, Siiskonen; 2009) So the authorities founded forestry schools in order to educate forest professionals into understanding German forest science. (Rauharahti; 2006, Paakoski; 2008, Fukushima; 2010)

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As shown in Table 1, both countries have some similar indexes for forest resources, total area, forest area, ratio of forest area and ratio between private forest area and public forest area. However, the population difference between the two countries is very significant. This difference has influenced their utilization of forest resources. Nowadays, there are big contrasts in their respective commercial roundwood removal.

Table 1: Basic data for forest resources in Finland and Japan

	Finland	Japan
Population (mil.)	5.4	127.8
Area (mil. ha)	33.8	37.7
Forest Area (mil. ha)	26.2	25.1
private : public (%) of forest area	60 : 40	58 : 42
Forest Area/Area (%)	77.3	66.4
Commercial roundwood removal (mil. cum)	52.4	18.5

Source: METLA (2012, annually), Rinyacho (2012, annually)

As shown in Figure 1, the synchronicity between Finnish forestry and Japanese forestry was also induced by personal exchanges. Many Japanese foresters in government, private enterprises and universities visited Finland on the way to central Europe. Because they published numerous reports, Japanese people had information about Finnish forestry in the pre-World War II. Many Japanese foresters in government and universities visited Finland on their way to Central Europe. And the paper pulp industries in Japan took a look at and gathered information about the forest sector in Finland.

Although no Finnish forester visited Japan in the pre-World War II era, we have a long history of a social science network concerning agricultural and regional issues. Ninety years ago, Gustaf John

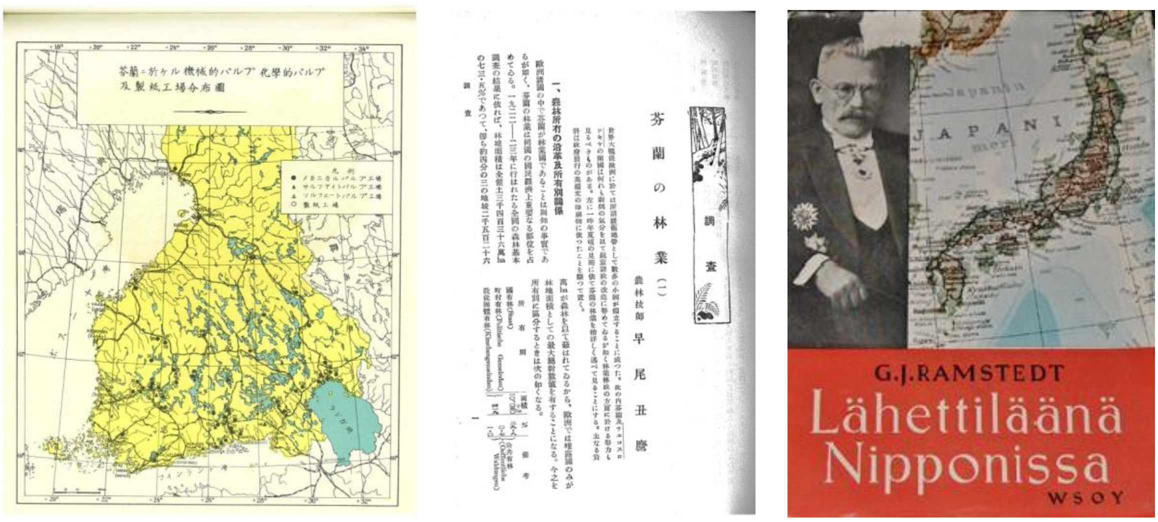

Figure 1: Historical literatures in Finland and Japan
Source: Ishigami (1933), Hayao (1926), Ramstadt (1950)

Ramstedt, who was a linguist and Finland's first envoy to Japan, had a great influence on Kunio Yanagida , an agriculture political scientist and a pioneer of Japan forkloristics, and Kenji Miyazawa, a poet, Märchen storyteller and agrarian.

3 Modern development of forest production

Figure 2 shows the production change of commercial roundwood in Finland and Japan from 1860 to 2011. From the mid-19th century both countries started to develop their forest sectors.

Until the mid-1910s the courses taken by both countries are much the same. However, their trends are very different from the mid-1910s to the 1920s. In Finland, turmoil during the independence caused a fall-off and these sudden increase in roundwood production. On the other hand, in Japan, declining production had been prolonged by increasing foreign timber imports. In the 1930s, after the Great Depression, both trends stepped up again. But World War II marked the beginning of contrastive trends. One of the major reasons was the different scale of the domestic markets.

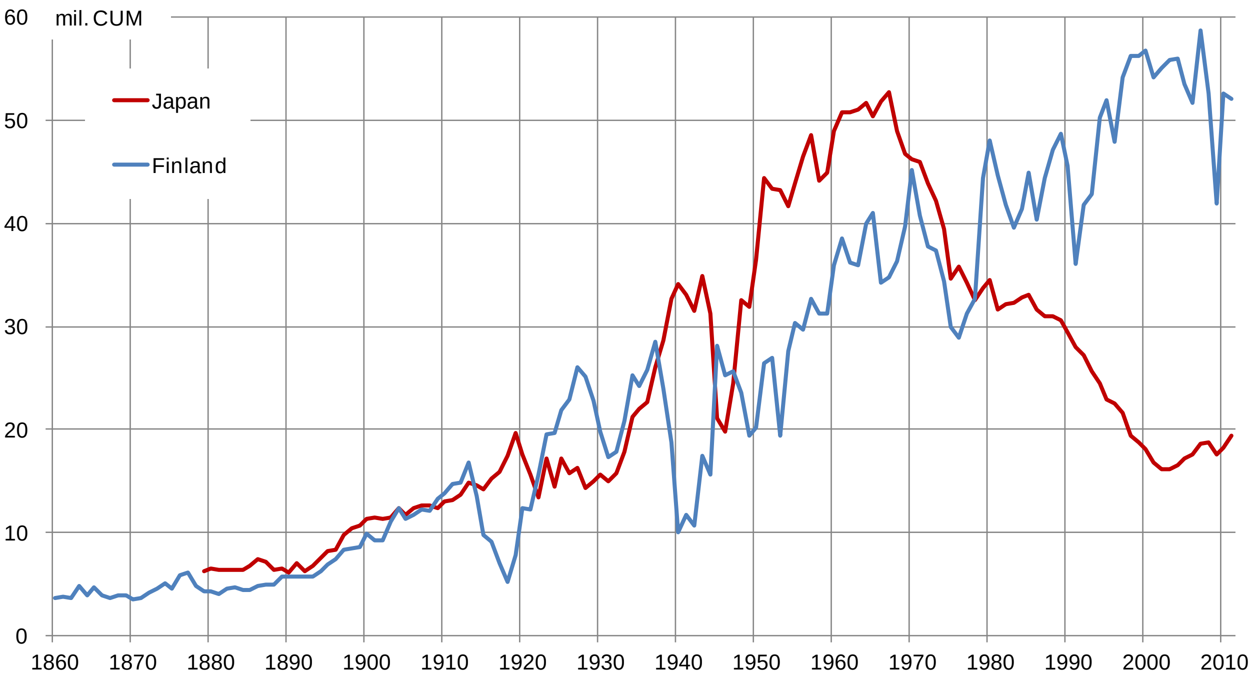

Figure 2: Production of Commercial roundwood in Finland and Japan (1860-2011)
Source: Kumazaki (1967), Kunnas (1972), METLA (annually), Rinyacho (annually)

After World War II, the revival of forest production started, moving alongside post-war restoration. Domestic roundwood production in both countries more than doubled for a quarter of a century. In this term, roundwood production in Japan always exceeded that in Finland owing to the higher pressure on forest resources. The underlying reason was the big domestic market in Japan, as was the case during World War II.

During the worldwide recession sparked by the two oil shocks in the 1970s, roundwood productions in both countries decreased at similar rates. However, from 1980 onward, the gap increased between respective roundwood productions. Nowadays, Finland's roundwood production is more than twice that of Japanese.

Figure 3 describes the change in total wood production, addings fuelwood production to the roundwood production of Figure 2. Before World War II in Japan fuelwood production was 2 or 3 times more than roundwood. And until the beginning of the 1960s, the fuelwood production was still huge. So Japan was pulling ahead of Finland concerning total wood production. The reason for this can be explained mainly by the size of population.

In the 1970s onward, fuelwood production in Japan declined, but in Finland a certain amount of fuelwood continued to be produced. These days, as biomass energy receives consideration, we will pay close attention to the future trends of both forest sectors.

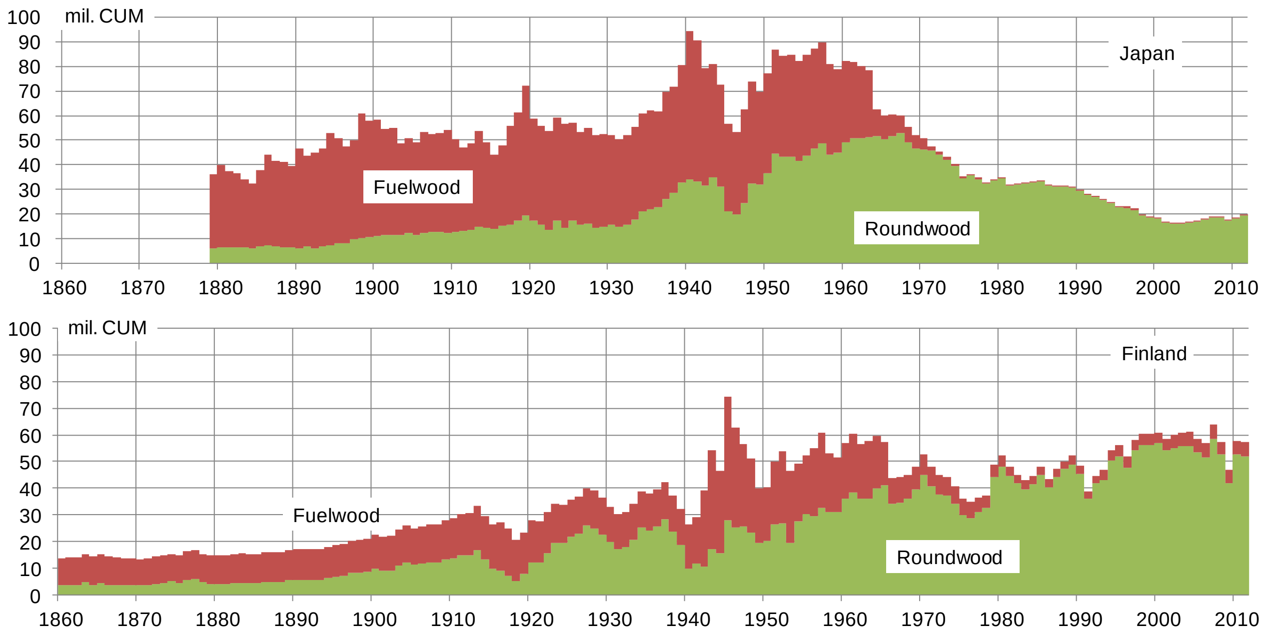

Figure 3: Production of Commercial roundwood and fuelwood in Finland and Japan (1860-2011)
Source: Kumazaki (1967), Kunnas (1972), METLA (annually), Rinyacho (annually)

4 Modern development of forest policies and economies

Comparing the history of forest policy and economics in Finland and Japan can clarify their developing paths. For such a purpose, we adjusted Table 2. We can see the transition of the two countries' forestry development for a century and a half.

There are many similarities in the paths of their forestry development. Both countries took off in terms of modernization in the mid-19th century. First of all, they clarified land boundaries and established education systems for foresters and forest laws, which consist of forest protection and world War II, both

Table 2: Modern history of forest policies and economies in Finland and Japan

Finland	Japan
1851 State forestry Administration	
1858 Forestry college	
	1867 Meiji Restoration
	1879 National forest service
	1882 Tokyo forestry school
1886 Forest act : no deforestation, police administration	
	1889 Crown forest
	1897 Forest act : no deforestation, police administration
	1899 National forest land act / National forest specil management project （-1922)
	1907 Forest act : Forest owners' association
	1911 Yamanashi prefectural gonernment was granted ownership of the imperial forests
1917 Independence / Forest act: no deforestation, state forester administration	
1918 Liberalization of tenants	
	1919 Ohryokuko paper
	1920 Act on public forest afforestation by national government
1922 Settlement act (Lex Kallio) / Forest taxation act	
1924 Regulation of forest holding market	
	1926 Act supporting forest cooperate facilities
1928 Forest improvement act / Protection of housing of loggers	
1928 Private forest act: no deforestation, semi-private forester administration	
	1929 Act supporting silviculture
	1929 Natural regeneration management (Dauerwaldgedanke)
	1933 Oligopoly of Oji paper
1935 Roundwood scaling act	
1938 National park	
	1940 Timber control measures act (-1950)
1943 Reforestation of degraded forests	
	1946 Unification of forest administration
1951 Forest management associations act	1951 Forest act : forest planning system, forest owners' cooperative
	1956 Japn forest development corporation act
	1957 National park act
	1958 Productive capacity reinforcement plan of the national forest
	1960 Liberalization of timber imports
1961 Fresh water act	1961 Timber production increase plan of the national forest
1964 Minimum wage regulation for loggers	1964 Forestry basic act
	1966 Common forest land modernization act
1967 Amendments in private forest and forest improvement acts	
	1972 nature conservation act
	1972 New forest management of the national forest
	1978 Forest cooperatives act / National forest management improvement act
1982 Forestry faculty university of Joensuu	1987 Comprehensive improvement act of resort area
1990 Amendment in private forest act	1991 Integrated system of regional forest management
1992 Earth Summit	
1993 Forest taxation / Amendment in private forestry supervision	
1994 State forest administration renewal as a business enterprise	
1995 Member state of the European Union	
1996 General forest act / Nature conservation act / Forest improvement act amendment	1996 Act on the security of forestry work force
1998 Liberalization of forest holding market	1998 Act on reform of national forest management
1999 National Forest Programme 2010	
	2001 Forest and forestry basic act
2005 Act on state forest enterprise (Metsähallitus)	2006 New wood production project
2008 National Forest Programme 2015 / METSO	2008 Act on advancement of implementation of forest thinning
2009 Development project of the forestry promotion organisations	2009 Forest and forestry revitalization plan
	2013 General accounting transfer of national forest management accounts

Source: Palo and Lehto (2012), Kohda (2011), Parpola and Åberg (2009), Rauharahti (2006) forest sectors were being influenced by rapid economic growth. And in the 1970s they were confronted with the nature conservation movement.

Since the Earth Summit held in 1992, both countries took different routes. Although Finnish forest policy has faced the environment era by establishing the National Forest Programme, on the other, hand Japanese forest policy has not taken adequate measures. However, the Finnish forest sector cannot rest due to expanding pressure on forest resources.

By tracing the long history of both forest sectors, we know the historic thinking behind forestry is important. It is necessary to continue thinking about the future trends of both forest sectors as long term issues.

Acknowledgements

This work was supported by JSPS KAKENHI Grant Number 23380095

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[PS13]

FSC Modular Approach Program (MAP)

A new FSC program to provide support & training for smallholders in the process of certification

Vanessa Linforth[1] and Shizuka Yasui[2]

1 Background of Forest management Certification

It is widely accepted that forest resources and associated lands should be managed to meet the social, economic, ecological, cultural and spiritual needs of present and future generations. Growing public awareness of forest destruction and degradation has led consumers to demand that their purchases of wood and other forest products will not contribute to this destruction but rather help to secure forest resources for the future. In response to these demands the Forest Stewardship Council (FSC) uses certification as a tool to promote responsible forest management worldwide, which over the past 19 years has been influential in driving demand for responsibly produced forest products.

FSC is an independent, non-governmental, not for profit organization established to promote the responsible management of the world's forests. The goal of FSC is to promote environmentally responsible, socially beneficial and economically viable management of the world's forests, by establishing a worldwide standard of recognized and respected Principles of Forest Stewardship. In 1993 FSC introduced the set of FSC's Principles and Criteria (P&C) together with an international certification and labelling scheme for forest products. With this scheme FSC commits itself to a challenging mission, as reconfirmed in the FSC Global Strategy 2007 (FSC 2007).

FSC Principles and Criteria (P&C) for forest management (FSC 2002, FSC 2012) apply to all tropical, temperate and boreal forests, and to natural forest, plantations and partially replanted forests, for all ownership and management tenure and for small to large-scale entities. More detailed indicators are prepared at national and local levels, based on a consensus of a broad scope of stakeholders in the given country (FSC 2009 a-c). FSC certification standards cover (a) forest management (FM), (b) the Chain of Custody (CoC) of products coming from FSC certified forest management, and (c) FSC Controlled Wood (CW) for forest management companies that comply with the five FSC Controlled Wood criteria, to be able to supply FSC Controlled Wood to FSC Chain of Custody operations which may then be mixed with wood from certified forests. Certified forest operations can claim that the forest products they produce come from a responsibly managed forest. However before a producer or supplier can sell their products as FSC certified, they must also obtain chain of custody certification (FM/COC) which tracks the origin of the timber or non-timber forest product along the supply chain.

As of the end of July 2013 there are **179.462 million ha** FSC-certified across the World. This is more than 1,218 forest management certificates, whose product is traded by **26,615** chain of custody **certificates.**

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The intent of FSC certification is that each additional hectare certified to FSC standards brings us closer to achieving FSC's mission: to improve forest management worldwide. This is based on the fact that independent certification bodies are visiting each certified forest management unit at least every year to check that the requirements of the standards are fully respected. Compliance failures are described in the public certification reports as Corrective Action Requests (CAR). These CARs have to be rectified within a certain timeframe. The CARs listed in the reports can be used as indicators to demonstrate where a change or adaption of forest management practices was required as necessary to comply with the FSC standard.

Participatory forest policy processes: Certification has made a tremendous contribution to creating space for broad participation and continuous adaptation in forest management and conservation efforts. Ros-Tonen (2004) summarized in the findings of an international congress on "Globalisation, Localisation and Tropical Forest Management in the 21st Century" that: "The FSC national standard-setting process has facilitated participatory forest policy processes, a better policy definition and has had very strong impacts on the ability of civil society and stakeholders to bring to the table issues around worker rights, tenure and health and safety standards in forest management. Stakeholder participation is especially strong at national level."

FSC is recognized as providing the most rigorous standards in forest management in the world and has had unprecedented success with 180 million hectares certified worldwide. Businesses of all sizes – from multi-national brands to domestic manufacturers – increasingly choose FSC for responsible sourcing, risk mitigation and market recognition. In addition, awareness of the pervasiveness of controversial and illegal logging in forest products industries continues, and over the last few years, many consumer countries and businesses have taken measures to eliminate controversial and illegal wood from their supply chains. Many have turned to FSC as a means to achieve this. Several independent researchers found evidence for a broad scope of direct and indirect benefits of forest management certification for forests and different stakeholders (see for example the literature review Karmann 2009).

2 Rationale and development of FSC's Modular Approach Program as a response to demanding certification requirements

2.1 The motivation for FSC's Modular Approach Program

The FSC Principles and Criteria for Forest Stewardship are now well established as the most widely recognized international standard for the certification of environmentally appropriate, socially beneficial, and economically viable forest management. Yet discouragingly, although demand for FSC products continues its rapid expansion, supply is not following a parallel trajectory. Often cited constraints include supply chain bottlenecks rooted in the difficulties faced by tropical and small forest operators in meeting the demanding FSC standards. Governments, civil society, NGOs and businesses face real challenges in sourcing the quantities of FSC certified products that they would like due to these constraints.

The Modular Approach Program of FSC (MAP)
provides an opportunity to change this pattern.

Achieving the full set of P&C requires a high level of performance from Forest Management Organizations. Many forest managers, especially smallholders and those in tropical countries, perceive FSC certification as prohibitive and inaccessible unless intermediate benefits are available along the path to certification that justify their efforts and investments.

As a response, in 2005 FSC approved a Policy in Modular Approaches to Forest Certification (FSC-POL-10-003) (FSC 2005). This Policy set up minimum criteria for credible stepwise schemes. The Policy also stated FSC’s own interest in exploring stepwise schemes and collaborating with entities operating credible stepwise schemes.

FSC’s Modular Approach Program (MAP) is an emerging initiative aimed at providing a structured path to achieve FSC certification by verifying defined steps, starting from the legal right to harvest to full FSC certification. FSC has drafted MAP standards (forest management, chain-of-custody, and accreditation requirements), planned the integration of smallholder support services, and developed a Monitoring & Evaluation system. In addition, FSC is carrying out field-tests and consultation throughout 2013 as part of a ‘controlled’ launch. In June 2011, following discussions at the FSC General Assembly, FSC took the decision to develop its own set of MAP standards. A Technical Working Group was established to guide the development of MAP standards for Forest Management, Accreditation, Chain of Custody and Trademark/ market claims. Through MAP, full FSC certification is accomplished in three time-bound and independently verified steps, starting with legality verification, then Controlled Wood certification, and ending with full FSC certification within a five-year period (see Figure 1).

There are 5 main elements in the FSC Modular Approach Program:

1. Application- A normative template submitted to an FSC-accredited Certification Body (CB) including a self-assessment of conformance with the basic requirements for participating in MAP.
2. Baseline Assessment- like a pre-assessment, this is organized and agreed to by the Organization and performed by an accredited CB.
3. Action Plan- developed by the Organization in response to the Baseline Assessment results, submitted to the CB for verification. The Action Plan details what the MAP participant will do to get FSC certified, and forms the basis for measuring progress in annual audits.
4. Formal participation in MAP, including annual audits from the CB and public reporting.
5. Three time-bound Steps (Legal, Controlled Wood, Full FSC), to be met within a five-year period.

For the first time FSC will be able to provide structured support to non-certified producers who have a commitment to becoming FSC certified but who need help and/or motivation to achieve this goal. MAP provides a lower entry level to the FSC system and allows for a more pro-poor approach to certification. It is also FSC’s response to new demand for legal verification, but in a framework that incentivizes Forest Management Organizations to keep improving their forest management practices and not just strive for the minimum. MAP creates an effective compliance link between each step so that each incremental improvement increases both the ability to achieve the next step as well as the overall ability to the meet the full standard. Finally, MAP is designed with a claims system that allows limited market benefits at the intermediate steps.

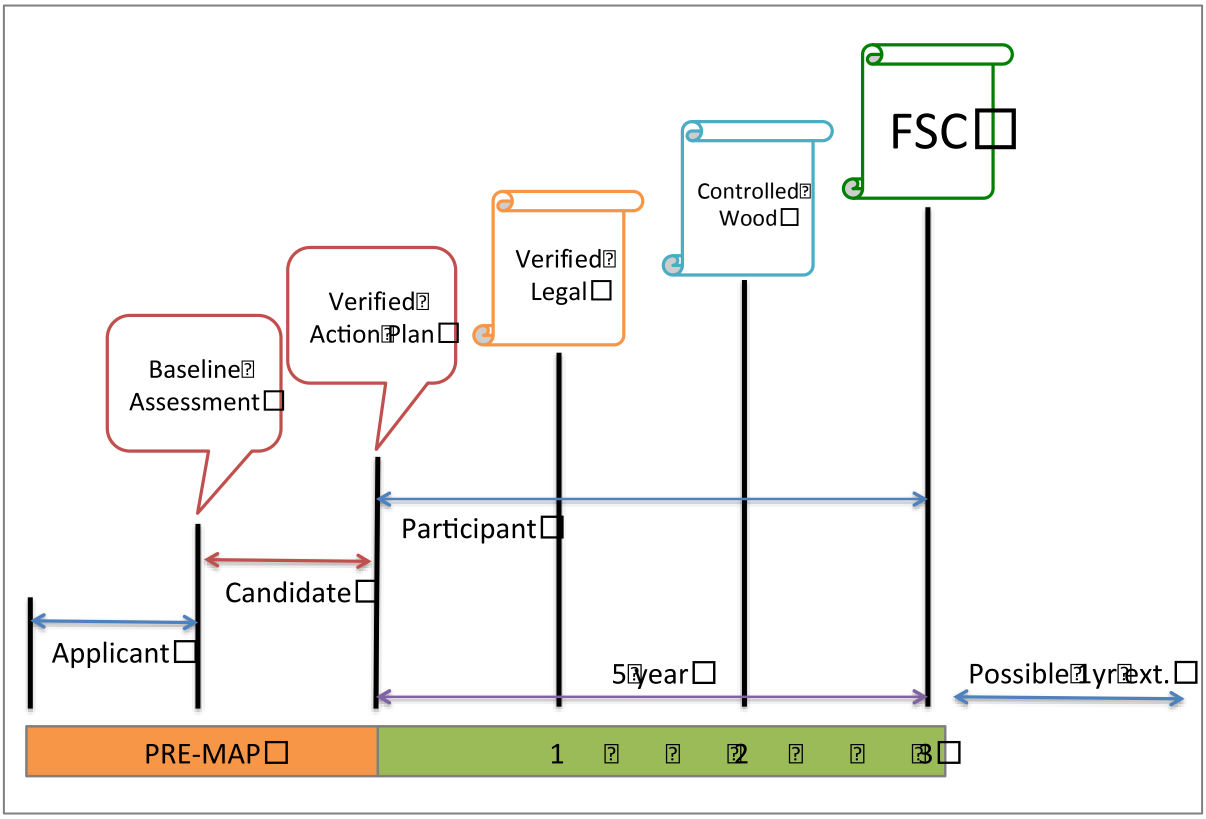

Figure 1: MAP diagram

Source: FSC International, 2012

3 An entry-level opportunity and a pro-poor approach

FSC MAP will formalize a lower minimum entry point into the FSC system. This is especially important for small and community producers who require more support to reach full FSC certification when faced with development barriers such as poverty, illiteracy, lack of market access, lack of financial resources or low business and entrepreneurial capacity. By engaging smallholders at an earlier stage, we can better understand how to help them overcome these barriers in a 'pro-poor approach'- where poverty reduction is a key outcome.

Through MAP, FSC is partnering with the UN FAO's Forest & Farm Facility to strengthen small forest management business viability by integrating their highly successful Market Analysis & Development (MA&D) toolkit. MA&D is a facilitated entrepreneurship development program with 4 phases to help smallholders develop their entrepreneurial skills and understanding as they pursue FSC certification. The end result is an enterprise development plan which complements the MAP Action Plan.

This will be coupled with a comprehensive modular training program, delivered by qualified FSC trainers in local languages and covering all aspects of FSC certification requirements, forest management practices, value-chain analysis, small business management and marketing.

With responsible management come lower levels of deforestation and better value from timber and non-timber products, which can help communities preserve their ecosystems for environmental, nutritional, cultural, and religious values while providing sustainable revenue streams. Furthermore, by progressing to FSC certification through a structured, stepwise manner communities are empowered to maintain decentralized control over their forest resources, secure clear tenure and use rights, and then given the resources to make entrepreneurial and business development decisions that mirror their progress in improving their forest management practices.

4 The Steps of MAP towards Full FSC Certification

4.1 Step 1: Legality

In an effort to serve businesses seeking to demonstrate timber legality, there has been a recent proliferation of private and public sector initiatives for legal verification. Yet these, too, face challenges. While they all aim at verifying product legality, procedurally and normatively there is significant variability between initiatives. Moreover, there is not one umbrella scheme or system to ensure consistency in standards or practice. And currently, there is no accreditation system for these legality verification systems. Simply put, while legality verification schemes have given businesses a place to turn, they fall short of providing continuity and independent credibility that FSC certification has built up over the past 20 years. Nor do they provide the incentive for moving producers to full FSC certification after they have reached legality.

In response to these issues and the adoption of new laws and regulations in consumer countries such as the USA, Australia and the European Union, MAP includes legal verification as the first step into the FSC system. In order to pass this step, the MAP Participant Organisation must be compliant with the Criteria & Indicators of FSC Principle 1 and it's Annex of all applicable legislation for the country of operation. These Annexes are currently being compiled by FSC's global network of national and regional offices.

FSC envisions that this step will require strong partnerships between governments, MAP participants and their Certification Bodies who will provide the compliance verification services. Field-testing is scheduled specifically for this step and also to research if/how existing national legal verification systems might be integrated into MAP compliance assessments.

4.2 Step 2: Controlled Wood

The second step in MAP is the already existent FSC "Controlled Wood" (CW) system. This system requires demonstrating a level of forest management performance which eliminates controversial sources but is lower than required for full FSC certification. Verified controlled wood may be processed with 100% FSC-certified material to produce an FSC mixed product according to strict accounting and labelling rules.

Controlled Wood has its own Standard (FSC-STD-30-010), which will be used as the verification tool for assessing compliance at MAP step 2.

The five controversial sources are:

1. Illegally harvested material
2. Material harvested in violation of traditional and civil rights
3. Material harvested in forests in which high conservation values are threatened by management activities
4. Material harvested in forests being converted to plantations or non-forest use
5. Genetically modified material.

4.3 Market incentives to 'step up to the standard'

In MAP, each step is designed to incentivize participants to keep moving up. Forest managers are mandated to plan out how they will achieve each step using an action plan which they are audited against annually. Lack of progress with the Action Plan, measured in major and minor non-conformances, can lead to suspension or even termination of their participation in MAP. However, progress is rewarded by increasing access to FSC trademarks and business to business (B2B) claims allowing market recognition.

Some are concerned that interim benefits will discourage Participants from progressing. To counteract this, full consumer recognition via FSC logo use is reserved for full FSC certification.

5 MAPME: MAP's Monitoring & Evaluation Program

5.1 Overview

FSC has heretofore struggled with demonstrating its direct impact on certified forest management units because the baseline prior to certification is often not defined. MAP offers FSC the unique opportunity to establish a monitoring and evaluation system (M&E) that follows the progress of MAP participants right from the outset and measures the impact of the FSC certification process on forest management units all through the steps and beyond. M&E will be focussed equally on the changes brought about to forest management practices, livelihoods and entrepreneurship.

MAPME will also allow for the adaptive management of the Program itself and indicate the midcourse corrections needed to ensure that MAP achieves its intended impact. MAPME is designed to measure the efficacy and reach of the program and assess if the incentives in the system are sufficient to both support participants and keep them focused on full FSC certification as the final goal.

It is estimated that MAPME will facilitate better investment opportunities for small and community forest producers who face challenges accessing finance, as the impact data being reported motivates companies and financial institutions to link their investments directly to positive impacts.

5.2 Methodology and data collection tools

MAPME is intended to be simple to implement, without placing undue costs or burden on the MAP Organization or the Certification Body, while yielding valuable information. Thus, the M&E data to be collected has been entirely embedded into the normative templates and reporting formats that form part of the MAP system, as illustrated below:

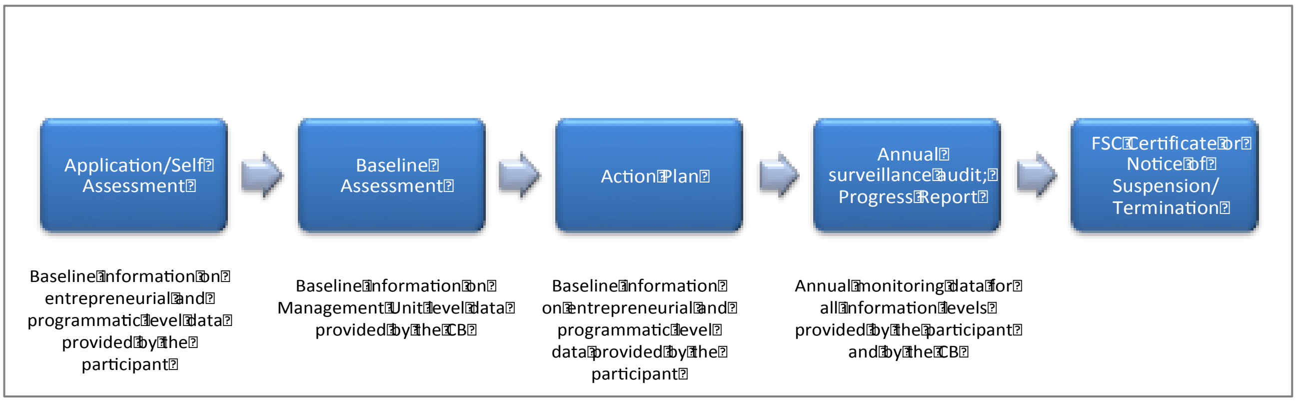

Figure 2: MAPME data collection tools

Source: FSC International, 2013

5.2.1 Collection of baseline Information

Some basic monitoring data will be collected in the Application Form template, right from the moment each Organization first applies to be part of MAP. Extensive detailed information will then be collected by the Certification Body during the Baseline Assessment and reported in a standardised Baseline Assessment report template.

5.2.2 Monitoring

Ongoing monitoring data will be gathered annually by the Certification Body and reported in standardised annual surveillance audit report templates. Regular review and reporting against Action Plan targets will help assess the Participants' progress towards FSC certification and the impacts of the process to date, and determine subsequent annual workplans for learning and improvement.

5.2.3 Evaluation

Evaluation of the monitoring data will be done subsequently by FSC International once the results of the annual surveillance audits have been reported into a centralized database. MAPME will be continuously evaluated and adapted on an ongoing basis in order to meet FSC's monitoring and evaluation needs.

6 Implementing the FSC Modular Approach Program

6.1 2011-2012: MAP Technical Working Group, template development, and MAP Support Plan

Made up of experts, members, and stakeholders involved in the FSC system, the Technical Working Group stewarded the development of forest management, accreditation, and trademark standards for MAP. Templates for the Self-assessment Form and the Action Plan were drafted in 2012 along with the M&E questions.

The MAP Support Plan (see Figure 3) 'bundles' the services of the Smallholder Support Program and makes them available at key stages to facilitate development, incentivize progress, and help smallholders utilize the benefits of FSC effectively.

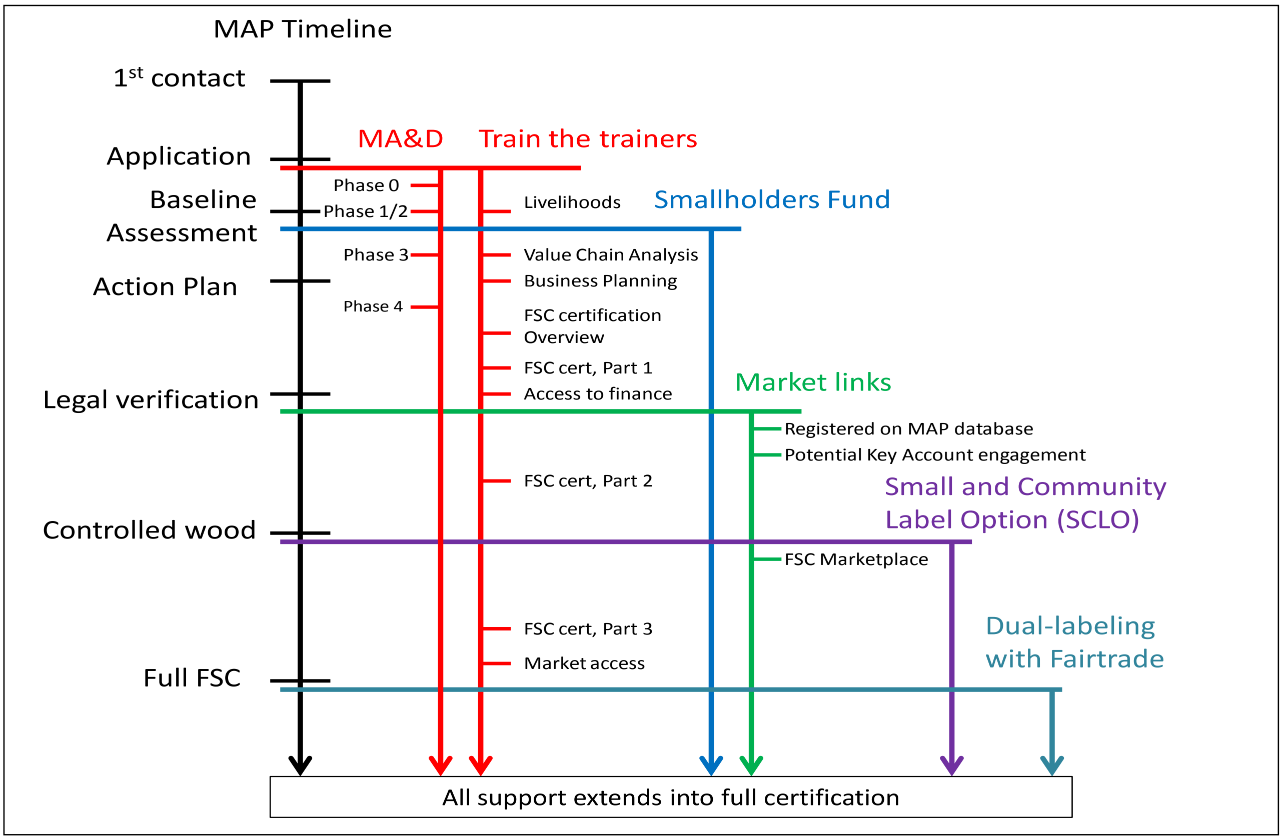

Figure 3: Smallholder Support Plan

Source: FSC International, 2012

6.2 2013: Field-Testing

Throughout 2013, FSC will work with FSC National Offices and accredited Certification Bodies to conduct 3 projects, representing the elements of MAP that are brand new to FSC:

Jan- May 2013 Development & field-testing of MAP 'package'

Field-testing the draft standards, templates, MAPME framework and impact assessment methodology.

June- Dec 2013 Application, Baseline Assessment & Action Planning

Field-testing the earliest phases of MAP, initial training and engagement with Certification Bodies, finalising the relevant documentation and guidelines.

June- Dec 2013 Reaching Step 1: Legal verification

Field-testing the process of getting legally verified, combined assessments with national legality verification systems and B2B claims related to legality.

All of these stages are fundamental to get right, as making access and legality too difficult will dissuade small and community producers from pursuing MAP and FSC to the point where they can maximize the benefit of being in the system and where FSC certification can have a lasting impact on their livelihoods. These pilots will be conducted in Africa, Latin America and South East Asia will likely include non-certified smallholder members of the WWF Global Forest and Trade Network (GFTN).

6.3 2014: Launch of MAP

FSC will review the results of the field-testing phase, make corrections to the program based on our learning, complete the consultation on the draft standards and launch MAP in Q2 of 2014.

7 Outlook

While MAP is in its initial phase, FSC and stakeholders will learn how the program can respond to the challenges for certification outlined above as they implement it. Throughout September and October FSC will be holding a public consultation where expert opinions are welcome. If you would like to be involved, please contact Vanessa Linforth, MAP Program Manager: v.linforth@fsc.org.

The topic of certification and its uptake offers many research opportunities for different disciplines, and FSC is willing to give feedback to questions, to discuss and to learn from research findings. For Research related questions please contact Marion Karmann, the Research Coordinator at the Quality Assurance Program at FSC International: m.karmann@fsc.org.

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[PS14]

A Study on the Success of Industrial Tourism Based on the Community Forestry in the Rural Areas

A Case of Checheng Community, Nantou County, Taiwan

Tseng, Yu-Liang[1]

1 Introduction

Checheng community in Nantou county is to be exceptionally gifted provided with gathering four features including the railroad, electric power, wood industry and agricultural special products This phenomenon has consequently provided rich natural and cultural resources that help to attract tourists to the rural areas. It would be interesting to find out how the community forestry could successfully integrate township planning and local industries to revive economy in these rural areas. Checheng commnuity in the Nantou County was a small community with old forestry resourcese in Taiwan. Today, a lot of visitors come to Checheng community to visit her attractions, including local railway ,forestry community landscape, agriculture without artificial fertilizers and insecticides, traditional arts and festivals, and forest industrial parks.

Figure 1: Location of Checheng
Source:By Tseng Yu-Liang

2 History

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In 1913 , during the Japanese colonial period, Puli Sugar Corporation built a railway for man -powered carts from Puli to Checheng to transport ca ne sugar. This cart railway later became the backbone of local transportation. Located in the middle of the railway , Checheng served as the repair center for carts and rest area for workers. Checheng (literally meaning, "cart square ") therefore had its name because it was the home for hundreds of man-powered carts.

In 1919 , Governor-General of Taiwan started the construction of Daguan Power Station . In order to transport the machinery , the Japanese expanded cart railway between Ershuei and Checheng, which later became today's Jiji Line. Between the railway opening in 1922 and the completed of Daguan Power Station , all trades of people flooded into the small town of Checheng and many shops sprang up. For the first time, Checheng saw amazing prosperit y.After the retrocession of Taiwan, Luanda Administration Office of Forestry Bureau outsourced the lumbering business of Danda Lumber Land to private corporations in October ,1958 Sun Hai's Chen -chang Corporation won the bid . Mr.Sun made great investment to build Danda Forest Road. His company then started forestry business in this area.

With the completion of Danda Forest Road, lumber could be continuously transported downhill. Chen-chang Corporation consequently established a lumber factory in Cheche ng to turn sawlogs into building and furnishing materials and other related products. At that time, Sun Hai bought a vast area of land and made a project of building factories , roads and facilities. Checheng again became a prosperous logging town full of job opportunities and foreign investors. It was not until 1985 when logging was banned and Chen-Chang Corporation was forced to leave that the economy of Checheng began to decline.

After the retrocession of Taiwan ,the Taiwan government established Fo restry Bureau in 1945 to manage forestry business . The production of lumber was rising , which also brought about the development of related businesses such as wood processing , camphor making , sawlog and paper pulp industries . These industries brought in foreign exchanges and boosted Taiwan's economy.

Due to poor regulations of the 1950s , the problem of deforestation worsened. In view of this,the

Forestry Bureau started a long-term reforestation project . It is estimated that 320,378 hectares of trees have been planted between 1945 and 1993 . The Forestry Bureau now enters into the stage of ecological forestry . To continuously develop the forestry , Forest Bureau has started to develop forest resort areas, advocate the importance of preservation, and make nature preservation regulations.

3 The development of forestry

In the 60s, Danda Lumber Land was the best -quality Hinoki cypress forest in Taiwan . The construction of Dunda Forest Road was extremely tough, since the road was built throug h the middle of cliff wall. Half-tunnels and half-bridges were common scenes along the road . No heavy machinery could be used in the beginning of the constrction. Except for some explosives , automobiles and light -duty tools manipulated by veteran soldiers, the project was mainly done by human power . The road built on a rugged cliff was finally completed in 1959.

The procedure of carrying sawlogs from the tree farm to the factory could be divided into four stages : felling , extraction, examination , and transportation.

- **Felling**—Before felling a tree, Forestry Bureau staff had to examine and record the data of the tree. Loggers used chainsaws to fell the tree. If the tree had a wider diameter, handsaws would be used to cut the tree.
- **Timber Extraction**—Extracting staff used the rear winch on a bulldozer or a simple two -reel winch to load the lumber on trucks.
- **Examination**—To make sure the logging process is in a accordance with the annual plan, logs had to be placed in Heliouping Log Yard to be exam ined by Forestry Bureau officials before they could be carried out.
- **Timber Transport**—Trucks were used as the vehicle to transport the logs from tree farm to Heliouping Log Yard for official examination as well as from Heliouping Log Yard for official examination as well as from Heliouping Log Yard to Checheng for timber storage after the examination.

Due to the convenient access to Checheng, Cheng -Chang Corporation decided to establish a lumber factory in Checheng. Checheng Lumber Factory was well-equipped with business offices, administration offices, a dormitory, wood storage grounds, wood storage pools, lumber making areas, and by-product processing areas.

The use of wood in Taiwan dated back to the pre -historical aboriginal era. For example, the Kavalan people used fish-patterned wooden carvings to record fishing results, and the Tao people used wood to build canoes. The demand for wooden tools increased as the Chinese settlers came to Taiwan in Cing Dynasty (Qing Dynasty) when some villages with carpenters dwelling collectively appeared. During the Japanese colonial period, native Taiwanese lumber.

Figure 2: Checheng Station

Figure 3: Checheng Lumber Factory

Source:By Tseng Yu-Liang

4 Industrial Tourism: Its Meaning and Development

In recent years, although the term “ industrial tourism” is quite often heard, yet people may not understand it in detail. Most people may sti ll remain in the understanding of the early traditional meaning while ignore the real definition which should also be focused on the effects of “entertainment” in the tourism programs, otherwise it would not give much help in the promotion of local economy.

“Danlin Forest”was the production center of the best quality Chi nese juniper of Taiwan in 1960s, and they were used for building the boat and vehicle. After the recession of Taiwan, in order to promote for better economical condition, government of Taiwan consigned the cutting right of Danlin forest to others, and at that time, Mr. Sun Hai obtained this “Danlin Forest”was the production center of the best quality Chinese juniper of Taiwan in 1960s, and they were used for building the boat and vehicle. After the recession of Taiwan, in order to promote for better economical condition, government of Taiwan consigned the cutting right of Danlin forest to others, and at that time, Mr. Sun Hai obtained this tender. After Mr. Sun Hai obtained the cutting right, he invested in a large sum to build Danlin forest road, and there were more than 3,300 people and soldiers to come here and brought the prosperous of Che Cheng. As Danlin forest road had to enter into Central range, it was very difficult that there were many engineering works opened in the middle of steep cliffs. During the construction period, the great disaster of flood had been damaged against the works. However, after it was completed, the overall length of the road is more than 80 km to be the longest road in Taiwan for wood carrying and transportation in 1971, there were about 500 carpentry companies exported wooden products to earn foreign exchanges. Wooden products can be found everywhere in daily life. There are countless examples of how Taiwanese people use wood: wooden houses foe housing: wooden carving, worship tables, deity figures for religion; containers, cooking utensils, bowls, chopsticks, and press molds for cooking; stools, beds, closets, holders, tables, and screens for furnishing; bathtubs, dressers, and combs for make –up; abaci for calculation and tops for entertainment. Even though wood is not the only materials for these purposes, wood still plays an important part in daily life of Taiwanese people. The development of wood industry is heading to a more exquisite and artful direction.

In 1960, because Chen Chang had railway at Che Cheng to carry the logs, they moved their operation center to Che Chang. At that time, Mr. Sun Hai purchased lands of large area for plant, road, and various facilities’ construction. Therefore, Che Chang became prosperous wood village instantly, and changed its fading face for the third time revival. At that moment, villagers depended on wood processing consigned by Chen Cheng, and the relationship between villagers and Chen Chang was closely and mutual reliable. However, the cutting policy stopped and ended in 1985, and so Chen Chang moved their businese to Che Cheng. But, the original construction and facilities did not removed off, the old dormitory still was left to accommodate for their old employees even the business of cutting had been closed. The culture of Chen Chang was still planted deeply inside the villagers, and this is the vital power of the culture here.

THE GLAMOUR OF THE WOODEN STRUCTURES –HYBRID

Wooden building have been nurtured from mankind’ s long history; Various kinds of structures have been birthed.

If one wants to establish a widen span, then he can use the wooden to form the triangular combination, which is best presented by the truss framework. It can form a large space, as this framework method has been in existence since the ancient past.

Current wide span frameworks utilize the laminated wood more and more. Two perspectives reveal that this is necessary. One perspective is from the effective application of natural resources. Everyone knows that forest resources are the most needed resources for protecting the earth's environmental; if the forest is left unattended, it will become an overgrown jungle or even start to deteriorate. This is a fact known by everyone. Therefore, in order to make the forest a healthy base that soundly produces oxygen, timber must be cut down intermediately so that the sunlight can evenly shine on every corner. Then, compress those cut timber into larger sections for effective usage.

The construction material that has evolved is the laminate d wood.

Another perspective is that wood is a very strong material with a good tightening characteristic. It is almost at strong as concrete. Its biggest flaw is that if you use it right after it was cut, the moisture it contains will ooze out and the resu lt is that the wood will shrink and crack. So, when using the wood as the construction material it should be first discharged of moisture. Laminated wood is what matches this purpose. We can also say that this is finding the wood's biggest advantage, whil e using artificial ways to reduce the flaws to zero . When faced with earth's current environmental problems, I believe the most suitable solution is to use laminated wood as a construction material.

Planning Concept 1—Emphasizes the conversation between wood and time.

The deep wood grain , left on the wood refined by time, resembles a kind of ancient taste and feel.

It's like exploring an old house filled with historic traces and hidden unknown stories.

There are traces of friction left by human hands on the door knob of the wooden window door.

Also, from the position and degree of the sunken wooden floor to the smoke burned traces on the window frame, one can imagine how this place was used by people in the past.

Amidst all these , the most obvious are a nnual rings of the wood, because friction from human hands and various factors have caused deep annual rings.

The needle woods have obvious different of spring and autumn wood, as well as different hardness that cause different degrees of abrasion.

Also, human hands have oil that causes the wood's surface to look glossy .

New wooden structures cannot have characteristics.

Therefore , a long time differential exists between the new and old wooden structures.

Planning Concept 2—Che Cheng T imber Industry Park Area- The Reappearance of Property Site.

We utilize the Ghen-Tsong timber factory to rebuild the T imber Industry Park Area.

The concept of the exhibit topic includes the regeneration and re -utilization of wood.

The regeneration process of the timber factor y has recorded the difference between past and present wooden structures.

Walking in the midst of the wooden structure, experiencing the real structural behavior of the wood.

The conversation between wood and time.

The exhibition of the procedure of maki ng wooden materials, with real machineries on display. The new influence that wooden constructions have on global environmental protection.

Planning Concept 3—Exhibition of 21^{st} century's new wooden structures.

1. The wooden structure of Ghen-Tsong timber factory was a product of early 20^{th} century. Back in the 1950's it was considered as a very advanced design.
2. The re-planning and redesigning of the timber museum, using the same wooden structure, but the materials and structural systems were that of 21^{st} century's new thinking and constructruction.
3. Laminated wood is a new and modern building materials . Its advantages are that of using minimum wood to achieve maximum spans . It saves materials and energy, while exhibiting br oad and wide space with Mechanical beauty.

Planning Concept 4—Manifest the contrast between modern and traditional wooden structures.

[The overlapping of the new and old] The renovated house has preserved the old roof truss

The Ghen-Tsong timber factory is regarded as a precious property site preservation items.

The old roof truss renovated is regarded as an exhibition item in the museum. The interesting overlapping of new and old wooden structures within the same space.

Figure 3: Model of Checheng wood Factory

Source: By Tseng Yu-Liang

5 Conclusions

In Taiwan, there is no village like Che Cheng to have such a close relation with electrical power. From Japanese built the first Menpaitan powerhouse at Sun Moon Lake in1919 to the second powerhouse of Sun Moon Lake in 1935, until Taiwan Power Co. built Minghu powerhouse in 1981, and built Mingtan powerhouse in 1987, and two powerhouses were made use of the reservoir of Sun Moon Lake. Under below of Sun Moon Lake, the valley of Che Cheng brought many people and engineers for powerhouse construction. Meanwhile, the prosperity of CheCheng was actuated. In the east of CheCheng is Sun Moon Lake dam, and Mingtan dam is in the north, so in the every corner of Che Cheng village a huge construction for dam bank on mountain walls can be seen at any time. "CheCheng" such a small village but has owned four powerhouse in Taiwan begins to send out its power, light and heat. We shall cherish the abundant resources and appreciate to the contributors of the past.

Today, Checheng maintained its outlook of small logging town. Along railway tracks, visitors can still find lumber factories, and facilities such as standpipes and coal -adding platforms for old steam locomotives. Walking in this town, visitors would feel as if they were in a small town of 1960s. Taiwan had an abundant of natural forests. Hinoki cypress, Luanta fir, Taiwania cryptomerioides, Taiwan increase cedar and Taiwan yellow cypress were the best five conifer trees of Taiwan. The Japanese regarded Taiwan yellow cypress as the best materials for special buildings like shrines. During the Japanese colonial period, Taiwanese Hinoki cypress and yellow cypress were the major kinds transported to Japan. The industry development in this period as well as the demand to support the Second World War contributed to the problem of excessive felling. The Japanese used Taiwanese lumbers to build railway, factories and ships. The three state-run tree farms felled down nearly 200’000 m3 of timbers during the period.

[PS15]

Study on Current Status and Task of Sawmills Located in the Woodland of Korea

Soo Im CHOI[1], Hag Mo KANG[2], Chong Kyu LEE[3]

1 Abstract

In November 2011, the government established the Timber Industry Promotion Plan (2012-2016) with the goal of developing the foundation for timber industry covering the forest management and timber production by expanding the market for timber industry from 24 trillion won up to 35 trillion won to increase the contribution of the timber industry to the timber industry, expanding per capita use of timber from $0.55m^3$ up to $0.63m^3$ to cope with climate change, and expanding domestic timber supply from 14% to 20%. However, there are many problems such as the intensifying competition in securing raw materials due to the disadvantage in the sustainable use of resources according to the disproportionate distribution of age groups, unplanned forest tree production, insufficient demand for wooden pellets, and the incompletion of legal system for the promotion of timber industry. On the other hand, there are hardly any empirical case study on the management of sawmills considering regional characteristics. Under the circumstances, this study intended to identify the problems related with the management and seek for the developmental direction of sawmills and the ways to expand domestic timber centering on sawmills located in 3 counties: Jangsu-gun, Jinan-gun, and Muju-gun, which are the typical forest areas inside Jeollabuk-do and are located in the inland area. According to the result, all sawmills surveyed used domestic timber that they were promoting public interest with the forest in the region through silviculture such as lumbering and afforestation and contributing to local economy and job creating by activating forest management.

Keyword: sawmills, timber industry, raw materials, regional characteristics

2 Introduction

The government has selected the promotion of environment-friendly wood industry as the key issue and decided to increase the timber self-sufficiency from 10% in 2005 up to 14% and 17% as of 2012 and 2017, respectively, through the 5th Basic Forest Plan (2008–2017) in order to foster resource

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recycling forest projects and uplift their competitiveness (Korea Forest Service, 2011c). The government also established the Timber Industry Promotion Plan (2012-2016) in November 2011 with the goal of developing the foundation for timber industry covering the forest management and timber production by expanding the market for timber industry from 24 trillion won up to 35 trillion won to increase the contribution of the timber industry to the timber industry, expanding per capita use of timber from 0.55m^3 up to 0.63 m^3 to cope with climate change, and expanding domestic timber supply from 14% to 20% (Korea Forest Service, 2011d). In order to achieve the goal the government is establishing detailed plans such as the expansion of the stable supply of domestic timber, the improvement of the competitiveness of the timber industry, the promotion of the use of wooden goods, and the development of the basis for promoting timber industry.

However, in the area of "expanding the stable supply of domestic timber," companies have problems such as the intensifying competition in securing raw materials due to the disadvantage in the sustainable use of resources according to the disproportionate distribution of age groups, the low-grade timber with low utilization values, short supply of timber inside Korea, and the increase of imported timber price. In the area of "improving the competitiveness of the timber industry," there are problems such as the pettiness of the timber industry and lack of effort to develop technology, the supremacy of lumberjack over the raw timber price and circulation, limitation in making precise estimation and prediction about the market due to lack of timber related statistical data, unplanned forest tree production, and the difficulties in securing stable raw material supply and consumption due to the small distribution of consumers. In the area of "promoting the use of wooden goods," there are problems such as insufficient national awareness and public relations concerning timber, insufficient use of timber by the people compared to foreign countries, and insufficient demand for wooden pellets, and in the area of "developing the basis for promoting timber industry," there are problems such as the weakening of productivity due to the decrease and aging of manpower in the raw timber production and timber industry, the limitation of productivity due to slow mechanization of forestry, the absolute insufficiency of forest road, and the incompletion of legal system for the promotion of timber industry (Korea Forest Service, 2011d; Korea Forest Service, 2012).

Under the circumstances, this study intended to identify the problems related with the management and seek for the developmental direction of sawmills and the ways to expand domestic timber centering on sawmills located in 3 counties: Jangsu-gun, Jinan-gun, and Muju-gun, which are the typical forest areas inside Jeollabuk-do.

3 Materials and Methods

There were 65 sawmills in Jeollabuk-do in 2008 and 2 more sawmills were added in 2010 that currently there are 67 sawmills. However, the number of sawmills in Korea reduced from 674 in 2008 down to 533 in 2010 that it decreased heavily in most areas excluding some areas. For the study, Jangsu-gun, Jinan-gun, and Muju-gun were selected for they are located in the inland area of Jeollabuk-do and manifested high forest rate. There are 14 cities and counties in Jeollabuk-do, and the forest ratio of entire Jeollabuk-do is 55%, and that of surveyed areas, Jangsu-gun and Jinan-gun, is 76%, respectively, and that of Muju-gun is 82%. The forest ratio of 11 cities and counties excluding 3 areas surveyed was 21-72% and 41% in average (Korea Forest Service, 2011b).

The survey targeted all sawmills located in Jangsu-gun, Jinan-gun, and Muju-gun, however, the survey was not held in Muju-gun for there were no sawmills in the area. There were 7 sawmills in Jangsu-gun, but 5 of them were included in the survey as 1 of them was new and another one refused to respond to the survey. In Jinan-gun, all 6 sawmills participated in the survey (Korea Forest Service, 2011b).

The survey was held in the form of direct interview for 4 months from the beginning of January to April, 2012 on general status such as the operating period, the age of owner, and the average number of days worked in a month and difficulties of saw mills such as the purchase volume of raw timber, purchase price, tree species, and operating condition, and data were comparatively analyzed by region.

4 Results and Discussions

4.1 General status of sawmills

Table 1: General status of sawmills

Division		Management Operating Period (Year)	Age of Owner (Age)	Number of Days Worked (Day / Month)	Employees (Person)	Monthly Average Salary (10,000 won / 1 Person)	Sales (100 Million Won / Year)
Average		11	52	23	6	171	6.9
Jangsu-gun	Average	15	52	21	7	188	11.1
	Sawmill A	10	53	20	7	184	10.0
	Sawmill B	12	41	24	5	170	7.0
	Sawmill C	20	58	15	3	135	3.5
	Sawmill D	30	62	24	6	250	20.0
	Sawmill E	4	48	24	15	200	15
Jinan-gun	Average	7	51	24	5	158	3.5
	Sawmill A	20	70	23	3	92	3.0
	Sawmill B	4	44	24	3	180	8.0
	Sawmill C	5	47	24	6	170	4.0
	Sawmill D	2	40	22	3	155	3.0
	Sawmill E	5	56	24	3	160	1.5
	Sawmill F	6	51	25	11	190	14

According to the general status of sawmills, 5 in Jangsu-gun and 6 in Jinan-gun, the operating period of 11 sawmills varied greatly from 2-30. The average operating period was 11 years, but it was 15 years in Jangsu-gun and 7 years in Jinan-gun that the average operating period of sawmills in

Jangsu-gun was at least twice longer than that of Jinan-gun. The average age of the owner was 52, and the number of days worked in a month was 23 days, the average number of employees was 6, and the per capita average salary was 1.71 million won, and average annual sales was approximately 700 million won. However, compared with national average, the average number of employees was approximately 3 people less and average monthly salary was approximately 29% less (Korea Forest Service, 2011a; Table 1).

Table 2: Status of raw timber purchase by sawmills and tree species (2011)

(Unit: %)

Division		Total		Larch		Pitch Pine		Korean Pine		Pine	
		Purchase Volume (㎥)	Purchase Amount (100 Million Won)	Purchase Volume (㎥)	Purchase Amount (100 Million Won)	Purchase Volume (㎥)	Purchase Amount (100 Million Won)	Purchase Volume (㎥)	Purchase Amount (100 Million Won)	Purchase Volume (㎥)	Purchase Amount (100 Million Won)
		43,553 (100.0)	52.2 (100.0)	42,840 (98.4)	51.7 (99.0)	358 (0.8)	2,543 (0.5)	247 (0.6)	2,079 (0.4)	108 (0.3)	540 (0.1)
Average		3,959	4.7	3,895	4.7	33	231	22	189	9	49
Jangsu-gun	Subtotal	19,395	24.2	19,260	24.1	135	1,400	-	-	-	-
	Average	3,879	4.8	3,852	4.8	27	280	-	-	-	-
	Sawmill A	2,700	3.5	2,700	3.5	-	-	-	-	-	-
	Sawmill B	2,745	3.2	2,610	3.1	135	1,400	-	-	-	-
	Sawmill C	720	0.9	720	0.9	-	-	-	-	-	-
	Sawmill D	5,130	6.6	5,130	6.6	-	-	-	-	-	-
	Sawmill E	8,100	10.0	8,100	10.0	-	-	-	-	-	-
Jinan-gun	Subtotal	24,158	28.0	23,580	27.6	223	1,143	247	2,079	108	540
	Average	4,026	4.7	3,930	4.6	37	191	41	347	18	90
	Sawmill A	1,800	2.2	1,800	2.2	-	-	-	-	-	-
	Sawmill B	3,600	2.0	3,240	1.8	216	1,080	36	180	108	540
	Sawmill C	4,261	5.5	4,050	5.3	-	-	211	1,899	-	-
	Sawmill D	547	0.7	540	0.7	7	63	-	-	-	-
	Sawmill E	450	0.6	450	0.6	-	-	-	-	-	-
	Sawmill F	13,500	17.0	13,500	17.0	-	-	-	-	-	-

Note: Figures inside ( ) refers to distribution ratio (%)

4.2 Raw timber purchase, production, and sales status

On the other hand, 11 sawmills handled only domestic timer, and 10 sawmills purchased raw timber through timber dealers and 1 sawmill, through the timer dealer or by itself. The average purchase volume for raw timber by 11 sawmills is approximately 4,000 m^3, and this accounts for 60% of the national average, 6,500m^3 (Korea Forest Service, 2011a). The most purchased specie was larch followed by rigida, nut pine, and pine in respective order, however, the larch accounted for 99% and 98% of the timber purchased by sawmills in both areas, respectively. According to respondents, the reason larch is used predominantly over rigida and nut pine is that it is highly demanded for it contains less resin, is light, and is durable. The purchase price of raw timber was 120,000 won for each m^3 of larch, 80,000 won for nut pine, 70,000 won for rigida, 50,000 won for pine that the larch was most expensive (Table 2).

On the other hand, sawmills surveyed mostly produced wood pillars for ginseng and landscaping plants and palettes regardless of the species (Table 3).

Table 3: Status of production by sawmills and tree species (2011)

(Unit: %)

Division		Larch	Pitch Pine	Korean Pine	Pine
Jangsu-gun	Sawmill A	Pillar for Ginseng Farm(100)	-	-	-
	Sawmill B	Pillar for Landscaping Trees (50) Palette (50)	Palette (100)	-	-
	Sawmill C	Pillar for Ginseng Farm(100)	-	-	-
	Sawmill D	Half-Finished Pillar for Landscaping Trees (100)	-	-	-
	Sawmill E	Packing Material for Exported Machines (100)	-	-	-
Jinan-gun	Sawmill A	Palette (95) Pillar for Ginseng Farm(5)	-	-	-
	Sawmill B	Pillar for Ginseng Farm (90) Pillar for Abalone Farm (10)	Pillar for Abalone Farm (100)	Pillar for Abalone Farm (100)	Pillar for Abalone Farm (100)
	Sawmill C	Half-Finished Palette (70) Palette (20) Mold for Construction (10)	-	Palette (Auxiliary Material) (100)	-
	Sawmill D	Palette (100)	Palette (Auxiliary Material) (100)	-	-
	Sawmill E	Pillar for Ginseng Farm (50) Half-Finished Palette (50)	-	-	-
	Sawmill F	Half-Finished Palette (100)	-	-	-

Considering the producing ground for the raw timber purchased by sawmills, both areas procured 80% of the raw timber within the province of Jeollabuk-do. Sawmills surveyed mostly produced wood pillars for ginseng and landscaping plants and palettes regardless of the species. However, domestic timber is mostly used as structural material for construction and temporary construction materials (40% and 23%, respectively) and only 9% of it is used to make palettes and 2%, agricultural tools

(Korea Forest Service, 2011a). Considering the sales of products manufactured by the sawmills surveyed, 69% of the pillars for ginseng farm were sold inside the province, 81% of the palettes were sold outside, and 50% of pillars for landscaping plants were sold inside. The reason most pillars for ginseng farm were sold inside is that there are many ginseng farms in Jangsu-gun and Jinan-gun (Table 4).

On the other hand, lumbering produces logging residues up to 8-30% of the raw timber. The logging residues are disposed by selling and Jangsu-gun and Jinan-gun sold 159t and 190t of side-splits, respectively, and earned 9.48 million won and 8.72 million won, respectively. The side-splits were sold for 20,000-70,000 won per ton, 50,000 won in average, and they were mostly used for manufacturing plywood or as fuel for heating. Jangsu-gun and Jinan-gun sold 3,000m^3 and 243m^3 of sawdust, respectively, and earned 47.36 million won and 5.95 million won, respectively. The saw dust was sold for 12,000-27,000 won per m^3, 17,000 won in average, and it was mainly used as the flooring for cattle shed or as organic fertilizer (Table 5).

Table 4: Raw timber producing ground and product sales status of sawmills (2011)

(Unit: %)

Division	Sawmill	Raw Timber Producing Ground			Areas the Products are Sold										
					Pillar for Ginseng Farm		Palette		Pillar for Landscaping Trees		Packing Material for Machines for Export		Pillar for Abalone Farm	Mold for Construction
		Total	Inside	Outside	Inside	Outside	Inside	Outside	Inside	Outside	Inside	Outside	Outside	Inside
	Average	100	89	11	69	31	19	81	50	50	50	50	100	100
Jangsu-gun	Average	100	84	16	55	45	-	100	100	100	50	50	-	-
	Sawmill A	100	50	50	10	90	-	-	-	-	-	-	-	-
	Sawmill B	100	100	-	-	-	-	100	100	-	-	-	-	-
	Sawmill C	100	100	-	100	-	-	-	-	-	-	-	-	-
	Sawmill D	100	100	-	-	-	-	-	-	100	-	-	-	-
	Sawmill E	100	70	30	-	-	-	-	-	-	50	50	-	-
Jinan-gun	Average	100	93	7	83	17	38	62	-	-	-	-	100	100
	Sawmill A	100	100	-	80	20	50	50	-	-	-	-	-	-
	Sawmill B	100	90	10	80	20	-	-	-	-	-	-	100	-
	Sawmill C	100	100	-	-	-	10	90	-	-	-	-	-	100
	Sawmill D	100	85	15	-	-		100	-	-	-	-	-	-
	Sawmill E	100	100	-	90	10	100	-	-	-	-	-	-	-
	Sawmill F	100	80	20	-	-	30	70	-	-	-	-	-	-

Note: Figures inside ( ) refers to distribution ratio (%)

4.3 Management conditions and difficulties of sawmills

Jangsu-gun entirely relied on domestic product for the purchase of raw timber and 16% of the raw timber they purchased was supplied from outside the province. Jinan-gun also entirely relied on domestic product for the purchase of raw timber and 7% of the raw timber they purchased was

Table 5: Logging residue sales status (2011)

(Unit: %)

Division		Total (a+b)		Side-Splits (a)		Saw Dust (b)		
		Income (10,000 won)	Quantity (ton)	Income (10,000 won)	Usage	Quantity (m^3)	Income (10,000 won)	Usage
		37,224 (100.0)	1,935	9,972 (26.8)	-	16,000	27,252 (73.2)	-
Average		3,384	176	907	-	1,455	2,477	-
Gangsu-gun	Subtotal	28,420 (100.0)	795	4,740 (16.7)	-	14,540	23,680 (83.3)	-
	Average	5,684	159	948	-	2,908	4,736	-
	Sawmill A	90	45	90	Cattle Shed Flooring	-	-	-
	Sawmill B	4,830	450	3,150	Fuel	840	1,680	Cattle Shed Flooring
	Sawmill C	1,500	300	1,500	Manufacturing Wrapping	-	-	-
	Sawmill D	10,000	-	-	-	3,700	10,000	Cattle Shed Flooring
	Sawmill E	12,000	-	-	-	10,000	12,000	Cattle Shed Flooring

supplied from outside the province. For management difficulties such as the difficulty in securing raw timber and finding manpower, the increase of raw timber price and transportation cost, the lumberjack requesting for advance payment for the raw timber, lack of facilities, and lack of substitute species, most sawmills in both regions considered maintaining current scale or closing rather than expansion. Some sawmills showed interest in manufacturing products using external materials, but most of them responded that they need state support such as reduction or exemption of tax or the loan on low interest rate as the need for the supplementation of facilities and the replacement cost and the increase of the cost of transporting raw timber are burdening sawmills that usually have weak capital strength.

5 Conclusion

As of 2010, there were 533 sawmills in Korea, and 9.2 people were hired by each sawmill in average, average monthly salary was 1,760,000 won, and the annual sales per sawmill was approximately 2.1 billion won. Considering the supply of raw timber supplied to ordinary sawmills, domestic timber accounted for 13% and the imported, 87%, and the specie was mostly coniferous tree. 430,000 m^3 of domestic timber (coniferous tree) was supplied and they were mostly larch and pine, 48% and 34%, respectively. Considering all 11 sawmills surveyed, the average operating period was 11 years, the average age of the owner was 52, the monthly average number of working days was 23 days, the number of employees was 6, the average salary per employee was 1,710,000 won, and annual sales was approximately 700 million won. All 11 sawmill handled domestic timber and in average sawmills purchased approximately 4,000 m^3 and 98% of it was larch. Considering the purchase of raw timber, the larch was purchased at 120,000 won per m^3, the nut pine at 80,000 won, the rigida at 70,000 won, and the pine at 50,000 won, in respective order, that the price of the larch was most expensive. Sawmills surveyed mostly produced wood pillars for ginseng and landscaping plants and palettes regardless of the species. Sawmills surveyed sold side-splits for 20,000-70,000 won, 50,000 won in average, and they were mostly used for manufacturing plywood and as fuel for heating. Saw dust was sold for 12,000-27,000 won per m^3, 17,000 won in average, and they were mostly used as the cattle shed flooring material and organic fertilizer. All sawmills that were surveyed relied on domestically produced raw timber, and 89% of the raw timber they used was supplied within the region. For management difficulties such as the difficulty in securing raw timber and finding manpower, the increase of raw timber price and transportation cost, the lumberjack requesting for advance payment for the raw timber, lack of facilities, and lack of substitute species, most sawmills considered maintaining current scale or closing rather than expansion.

Therefore, the following measure shall be established in order to foster sawmills in the inland region. Unlike sawmills located in large cities or ports, the sawmills located in the inland region only use domestic raw timber, not only promoting public interest with the forest in the region through silviculture such as lumbering and afforestation but also contributing to local economy and job creation by activating forest management that they need extensive state support. In order to secure the smooth supply of domestically produced raw timber, species that can substitute larch must be developed urgently, and the species that are not used diversely such as rigida and nut pine need to be replaced with useful species. The revitalization of sawmills within the region requires the manufacture of products essential for the agriculture or industry in the region. For this, it is necessary to secure stable supply of a variety of tree species through systematic afforestation plan. Lastly, the stable supply of raw timber to sawmill within the region also requires the administrative support of the local government in order to prevent the leakage of raw timber produced within the region to other regions.

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[PS16]

Vocational Training Centres as Hubs for Community Forestry Extension in Solomon Islands

Timothy J. Blumfield[1] and Frédérique Reverchon[1]

1 Introduction

The Rural Training Centres (RTCs) are vocational training centres established to give life skills training to young people who have not completed formal education. There are 45 RTCs and a further 55 Community Based Training Centres (CBTCs) scattered throughout the Solomon Islands archipelago, making them the ideal base from which to offer community forestry extension. As part of a project for the Australian Centre for International Agricultural Research (ACIAR), we have developed a model for establishing the RTCs and their associated CBTCs as hubs for community forestry extension, organising workshops and field days within their communities, providing training in agroforestry and forest rehabilitation and establishing community-based nurseries for the distribution of the improved planting material that the project is developing.

ACIAR project FST/2007/020 "Improving silvicultural and economic outcomes for community timber plantations in the Solomon Islands by interplanting with Flueggea flexuosa and other Pacific agroforestry species" established demonstration trials in three RTCs (Blumfield et al., 2013), though this in itself led to the uptake of agroforestry into a further 13 of the 34 RTCs.The partnership with the Solomon Islands Association of Rural Training Centres (SIARTC) has been an important aspect of disseminating agroforestry information in a country with poor infrastructure and communications and this relationship will be strengthened in the new project.

1.1 The Tyranny of Distance

Solomon Islands is an archipelago of nearly 1,000 islands that vary in size from small coral atolls to large volcanic ranges (Figure 1). Less than 20% of the population live in urban areas, the rest are scattered throughout the country, mainly on the larger volcanic islands. There are less than 600 kms of public roads in the entire country (C.I.A., 2013) meaning that boats are the primary form of travel for everywhere outside the main population centres on Guadalcanal and Malaita. Transport services are reasonable to these larger population centres but hardly exist elsewhere. The most prolific form of local transport is the wooden canoe, carved from a single trunk of the canoe tree (*Gmelina moluccana).* Those who can afford it have larger boats with an outboard motor, either wooden, fibreglass or aluminium which are often used for inter-island trips.

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Figure 1: Solomon Islands

The difficulty of communication provides very real challenges for extension work mainly due to the lack of basic infrastructure that inhibits travel between communities. When project FST/2007/020 was established, our original intention was to establish demonstration trials in a few locations that would act as a focal point for extension work with growers brought in for field days and 'training the trainer' opportunities. There was also the problem of land tenure. Melanesia has a complex system of land ownership (Mohamed and Clark, 1996) with a mix of matrilineal and patrilineal societies and actual land ownership obscured beneath interweaving layers of custom and obligation. Even the trees on land owned by one person can be the property of another. Establishing potentially valuable plantings on customary land was an open invitation to conflict. It was therefore essential that demonstration plots had to be established on land that was free of customary obligations with a clear and established title.

Both Government-owned and Church-owned land met this criteria and the involvement of both bodies in education throughout the Solomon Islands provided the vital key to the solution of both problems. In particular, the involvement of the many different Christian denominations in non-formal education through the rural training centre network, and the establishment of these RTCs on church-owned land provided both the unencumbered land and the vector for the dissemination of the agroforestry systems. There is a long history of church involvement in non-formal education and the rural training centre model has proven responsive to local needs in a manner often unavailable to the rigid structures of the formal education system (Reymer, 1999). Rural Training Centres are run by specific denominations and draw their trainees from all over the Solomon Islands, not just from the local community. These centres therefore become the ideal locations for both training and demonstration plots as trainees return home to villages throughout the archipelago, taking with them the ideas and knowledge gained at the Centres.

2 Method

In order to test the effectiveness of the proposed model for the development of RTCs as a focus for extension activity, we have selected 5 RTCs in separate provinces to develop as community forestry hubs (Figure 2). FST/2007/020 established demonstration trials in three Rural Training Centres (RTCs), though this in itself led to the uptake of agroforestry into a further 13 of the 34 RTCs. In agreement with the SIARTC, this involvement will be expanded with the aim of including agroforestry trials in most of the remaining RTCs and secondary forest management trials in some (3 - 6) of the community-based RTCs (CBTCs). Community-based nurseries will be established to provide the improved seedlings that will underpin the success of this approach.

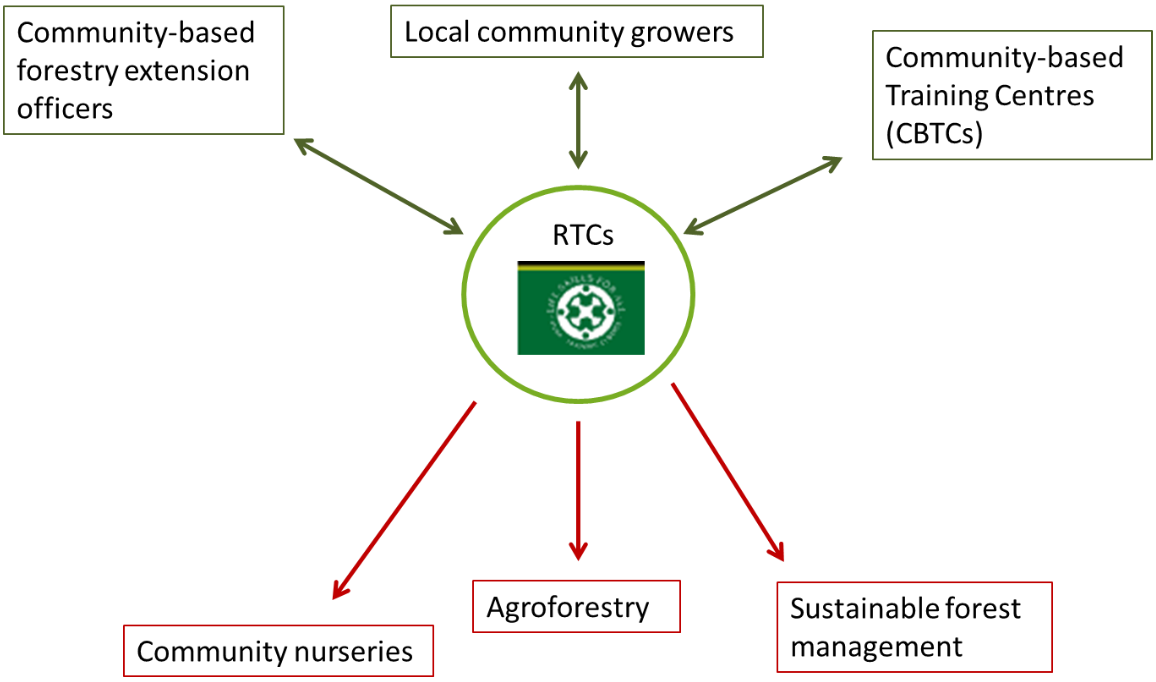

Figure 2: Conceptual framework establishing the role of RTCs as a hub for the dissemination of knowledge on community forestry extension.

3 Discussion

3.1 Agroforestry Extension in a Fragmented Landscape

Community forestry extension has been virtually non-existent in Solomon Islands due mainly to the difficulty of travel and communication. Forestry extension has always been heavily reliant on field days and workshops and, in areas where education levels are poor, a practical, hands-on approach to extension is paramount. One of the legacies left behind by the AusAID funded Forest Management Project was a network of Community-Based Forestry Extension Officers (CBFEOs) who, as the name suggests, live within rural communities providing advice on forestry matters. These CBFEOs are poorly resourced and receive little practical support from Head Office in Honiara, again due to the difficulties of travel and communication. It therefore seemed logical to bring the RTCs and the CBFEOs together.

We have also received support from the Ministry of Agriculture for the involvement of the Agricultural Extension Officers in the development of the RTC hubs. Our partnership with the Solomon Islands Association of Rural Training Centres (SIARTC) has been an effective tool for reaching students and it has been decided to make this network the basis for extension activities, drawing upon the close linkages between the RTCs and their local communities. We were particularly interested in utilising the relationships between the established RTCs and the Community-Based Training Centres (CBTCs) which are established by local communities and which call upon the RTCs to provide trainers as needed.

3.2 Sustainable Forest Management

Not all areas within the Solomon Islands are suitable for commercial plantings due to location and remoteness, yet in many cases the local forest has been destroyed or severely degraded by logging operations. These areas are ideally suited for reforestation projects that will restore the timber and non-timber resources for local use and will have the capacity to benefit local communities through carbon and biodiversity credits through schemes such as the CDM and REDD+. As part of the strategy for keeping growers informed of the choices they have with regard to forestry, this project will establish trial areas to examine the use of agroforestry as a tool to bring about forest rehabilitation. Research trials will examine rehabilitation strategies while also examining the potential to feed in to the carbon and biodiversity credits available through REDD+.

These trials will be village based but there are also community based RTCs which will be the focal points for the rehabilitation activities. Most RTCs are denominational and are separate from specific communities, operating on church land. CBTCs are situated within villages to train the village young people in vocational skills and they therefore have access to village land for their activities. This approach will require the active participation of the village landowners who will be involved from the onset of our engagement with the RTCs. We will involve both CBFEOs and the community-based RTCs in trials to improve degraded forests through agroforestry with field days starting in the second and third years to demonstrate the results to the community. Students will be trained to undertake biodiversity monitoring using a transect-based approach to identify and number local birds and results will be collated and displayed during field days. Growth measurements by the students will be used to demonstrate carbon gains from agroforestry plots, thinning trials and secondary forest management trials. The results will also be displayed at the RTCs and used in Field days and workshops.

3.3 Community-Based Nurseries

The end of the supply chain for providing high quality germplasm to communities will be the establishment of a network of community-based nurseries that will use the improved genetic material being developed through our own projects and through the Ministry of Forestry. A specific approach of this initiative will include community participation in the propagation of seed stock; thereby engaging local knowledge and practices in the nursery and tree planting program. Currently the teak seed most widely planted in the Solomon Islands comes from a clonal orchard established and distributed through the Ministry of Forestry. A provenance trial underway on Kolombangara will soon be turned into a seed production area, further improving the available germplasm and our iown project has established a seed production area for *Flueggea flexuosa*, the local tree we use in out agroforestry trial. Seed from these seed production areas will be supplied to the community nurseries through the forestry network, a system that will be enhanced by the involvement of the CFEOs.

4 Conclusion

RTCs were developed as a response to the difficulties of transport and communication in Solomon Islands. The Community based RTCs were developed as communities identified specific needs within their own areas and involved the active participation of the community. There institutions are therefore the ideally placed as the centres for extension activities and, through the establishment of demonstration trials can exist as a practical resource for other extension activity.

Acknowledgments

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[PS17]

Profitable practice management in native forests to sustain timber production: an opportunity for the private sector

Shahla Hosseini Bai[1,2], Timothy J. Blumfield[3], Frédérique Reverchon[4] and Sean Ryan[5]

Abstract

In Australia, approximately 70% of native forests are on privately owned lands. This study aimed to explore the growth response of selected native species to different stocking rates compared to un-thinned and overstocked forest. Two experimental sites were situated in Rathdowney and Esk located in south-east Queensland, Australia. The stocking rates were 50-100 stems ha^{-1}, 100-150 stems ha^{-1} and 200 stems ha^{-1} and un-thinned (control). The diameter at breast height (DBH) of trees was measured at both sites and the Mean Annual Increment (MAI_{dbh}) of all treatments was compared with the MAI $_{dbh}$ of un-thinned (control) areas. At Rathdowney, both stocking rates of 50-100 stems ha^{-1} and 100-150 stems ha^{-1} showed significantly greater (MAI_{dbh}) than control at years 1, 2 and 4 following thinning ($P<0.05$) . At Esk, all stocking rates of 75, 120 and 200 stems ha^{-1} had significantly higher (MAI_{dbh}) compared to control at years 1 and 3 following thinning ($P<0.005$). Our results indicated that the thinning of native forest to the stocking rates between 50 and 200 stems ha^{-1} improved tree growth significantly.

1 Introduction

Farm forestry practices are sustainable alternative to mono-species plantations. A study in Australia indicated that mono culture plantations are less productive compared to plantations with greater diversity (Erskine et al. 2006) which may suggest greater income for private sector where farm forestry is used (Pandey 2002). Farm forestry also provides a range of ecosystem services including restoring understory (Lemenih et al. 2004), preventing soil erosion, and supporting native wildlife (Pandey 2002; Smith and Agnew 2002). The importance of farm forestry to sequester carbon cannot be ignored (Roxburgh et al. 2006) considering that Australia aims to enhance the area under farm forestry by 2020 to twice the 2002 area (Ryan et al. 2002).

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In sub-tropical Australia, forests types are usually tall open forests dominated by spotted gum which produce an outstanding timber and are also resilient to harsh conditions (Lee 2007). The main species of spotted gum in sub-tropical QLD and NSW belong to the genus *Corymbia* (Johnson et al. 2009). These species are suited to a wide range of soil and precipitation conditions (Johnson et al. 2009). Farm forestry aims to preserve native species to sustain timber production. Studies that report tree growth under different tree densities in farm forestry are scant whereas it has been well documented in plantations worldwide (Henskens et al. 2001; Alcorn et al. 2007; Van de Walle et al. 2007). Such studies are crucial to explore the optimum tree density in farm forestry to ensure accelerated tree growth and to shorten the rotation length for harvesting. This study aimed to investigate the growth rate of spotted gum trees subjected to different stocking rates compared to un-thinned and overstocked forests.

2 Methods

2.1 Site description

The two experimental sites were situated at Rathdowney and Esk located in south-east Queensland, Australia. Rathdowney site is located approximately 100 km south of Brisbane and was established in 2008. The vegetation class is open forest with remnant vegetation *Corymbia citriodora* K.D.Hill & L.A.S.Johnson (Lemon-scented spotted gum) and *Eucalyptus crebra* F.Muell (Narrow-leafed Iron Bark). Rathdowney received a rainfall within a range of 750 mm to 900 mm in the year following the thinning. Esk is located approximately 200 km south of Gympie and was established in 2009. Esk is categorised as open forest dominated by *C. variegata* (Spotted Gum)*, C. intermedia* (Red Bloodwood) and other *Eucalyptus* spp*.* The understorey includes *Acacia* spp. and Whipstick Lophostemon. The annual precipitation at Esk varied on average between 900 mm and 1500 mm from 2009 to 2012 (Fig. 1).

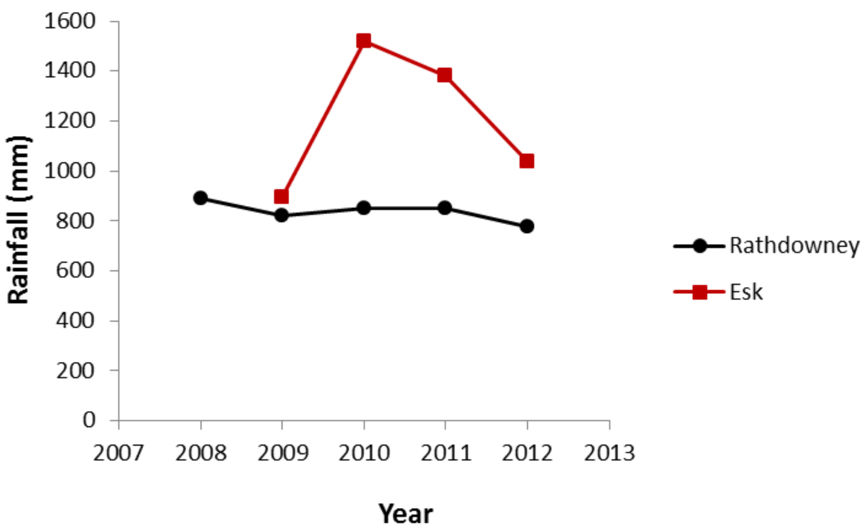

Figure 3: Rainfall (mm) at Rathdowney and Esk from 2008 to 2012

2.2 Experimental design, treatments and measuring time

At Rathdowney, the treatments consisted of the thinning at the rates of 50-100 stems ha^{-1} and 100-150 stems ha^{-1}. DBH was measured in 2008, 2009, 2010 and 2012. Afterwards, the MAI_{dbh} was calculated at years 1, 2 and 4 following thinning at Rathdowney. At Esk, the treatments included thinning at the rates of 75 stems ha^{-1}, 120 stems ha^{-1} and 200 stems ha^{-1}. The DBH of trees was measured on 2009, 2010 and 2012. Therefore, MAI_{dbh} was calculated for years 1 and 3 following the thinning.

2.3 Statistical analysis

An univariate analysis was carried out to differences in MAI_{dbh} among treatment at both sites using an IBM SPSS Statistics (Version 21).

3 Results

At Rathdowney, at all years following thinning, annual MAI_{dbh} was significantly higher at both stocking rates of 50-100 stems ha^{-1} and 100-150 stems ha^{-1} than that of control (P<0.05; Fig. 2) . No significant difference in $MAI_{dbh}$of both stocking rates was observed regardless of measuring time. Interaction between stocking rate treatment and measuring time was significant (P<0.05, Table 1).

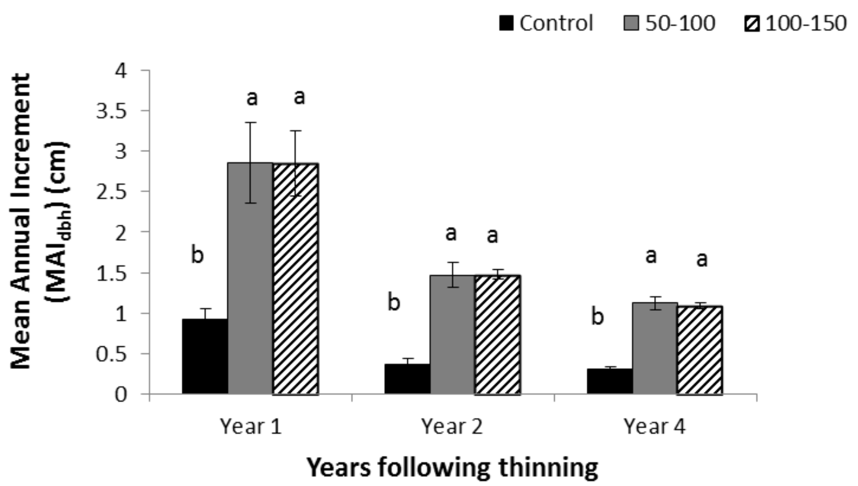

Figure 4: Mean Annual Increment (MAI_{dbh}) at Rathdowney

At Esk MAI_{dbh} was significantly higher for all stocking rates than that of the control plots at both years 1 and 3 following thinning (P<0.05; Fig. 3). Whilst MAI_{dbh} at the stocking rate of 200 stems ha^{-1} was significantly lower than 120 stems ha^{-1} at year 1, no significant difference in MAI_{dbh} was observed between 120 stems ha^{-1} and 200 stems ha^{-1} at year 3 (P<0.05; Fig. 3). Interaction between stocking rate treatment and measuring time was significant (P<0.05, Table 1).

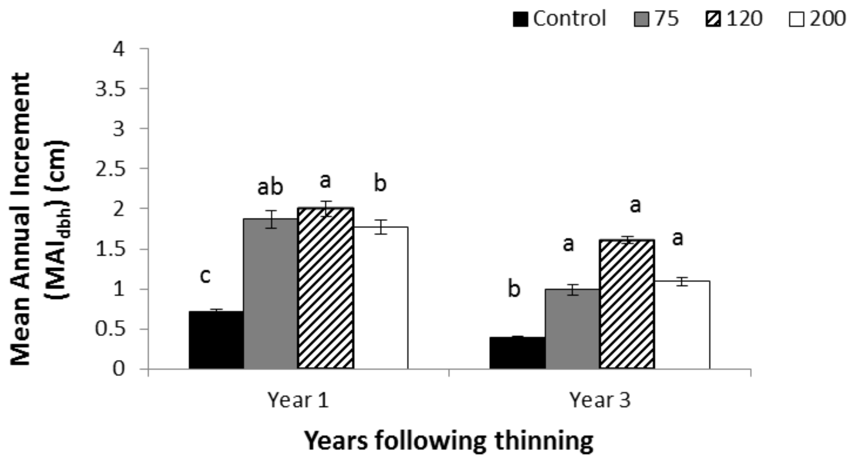

Figure 5: Mean Annual Increment (MAI_{dbh}) at Esk

Table 1: Probability from ANOVA for Mean Annual Increment (MAI_{dbh}) for both Rathdowney and Esk.

	df	MS	Probability
Rathdowney			
Stocking rate	2	125	**P<0.05**
Year	2	93.1	**P<0.05**
Stocking rate × year	4	8.91	**P<0.05**
Esk			
Stocking rate	3	152	**P<0.05**
Year	1	59.8	**P<0.05**
Stocking rate × year	3	3.07	**P<0.05**

4 Discussion

Our results indicated a significant improvement of (MAI_{dbh}) in all stocking rates following thinning. It is crucial to find an optimum stocking rate in farm forestry to maximise the benefits. Tree density controls the availability of limited resources including light, water and nutrients (King et al. 2005; Paoli et al. 2008; Bucci et al. 2009). Whilst increased density may enhance competition leading to decreased resource allocation to trees which would decline tree growth and biomass allocation, less tree density with greater tree spacing may not always benefit timber production because trees begin to invest in their crowns and leaves rather than woody parts (Henskens et al. 2001; Alcorn et al. 2007). Considering that there was no significant difference in tree growth between stocking rates it would be beneficial to adopt the higher rate (200 sph), allowing for maximum return on investment.

At both sites, tree growth rate was significantly higher one year following thinning and slowed down afterwards but still remained significantly higher than those of the control plots which was probably a response to higher resource availability. It has been shown that thinning improved soil nitrogen availability and accelerated microbial activity due to changes of soil temperature in the first year following thinning (Thibodeau et al. 2000). Tree growth improvement due to thinning can remain years following thinning. In a study in Canada, tree growth in thinned areas was significantly greater than those of un-thinned even 34 years following the thinning (Zhang et al. 2006).

The site establishment costs in farm forestry may not differ significantly compared to site preparation at plantations to produce timber but there are no costs associated with nurseries, seed collection or planting. However, the ecosystem services that farm forestry practices provide, are invaluable for both forest ecosystems and farmers and may be a substantial part of stable farm income in the future

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[PS18]

Economic contribution of small scale forestry programs towards rural development: experiences from Bangladesh

Kazi Kamrul Islam[1&2], Takahiro Fujiwara[2] and Noriko Sato[2]

1 Introduction

In recent times, there is a growing concern worldwide of the shift in natural resource management away from top-down, traditional management towards a more people oriented approach that integrates local communities and all stakeholders in decision-making (Brown 2009; Ribot 2004). In addition, decentralization in forest management policies started as a response to institutional malfunction; and during the last decade institutional changes like people oriented (small scale) forest management paradigms have become major policy trends in many of the world's developing countries (Shahbaz 2009; Ribot 2002; Gilmour 2003; Prasad and Kant 2003; Rosyadi et al. 2005). Many countries have already developed, or are in the process of developing, changes to state laws and policies that institutionalize people oriented forest management approaches.

This process of people oriented forest management initiative has implemented in Bangladesh in 1980s with the funded of donor agencies. At the same time these programs in the government owned degraded Sal forests and other fellow lands has been considered as top priority by the Forest Department (FD) of Bangladesh. It was due to fact that massive human settlements (like-40,000 new settlements in Madhupur Sal forests) were introduced in and around the forests area since the independence of Bangladesh in 1971 (Islam and Sato 2012a). Out of three forest types of Bangladesh, Sal forests were considered more economic and environment importance (Safa 2004), and treated as the most threatened ecosystem (Islam and Sato 2012b; Alam et al. 2008; Muhammed et al. 2008; Salam and Noguchi 2005). Therefore, it is necessary for government as well as development organizations to provide alternative livelihood options to the poor so as to conserve Sal forests and rural developments. Consequently, in 1989 Asian Development Bank (ADB) supported different small scale people oriented forestry programs launched at the degraded Sal forests area under the control of FD. However, determination of economic contribution is the key step towards understanding the role of small scale forestry approaches in improvement of livelihoods and poverty alleviation of forest dependent people (Kafle 2008; Chhetri 2005). It is apparent that different small scale forestry programs have provided different outputs or income to the participating people. Therefore, this study attempts to measure the economic outputs of small scale forestry programs at Sal forests area and also explore the influence of these programs on rural development.

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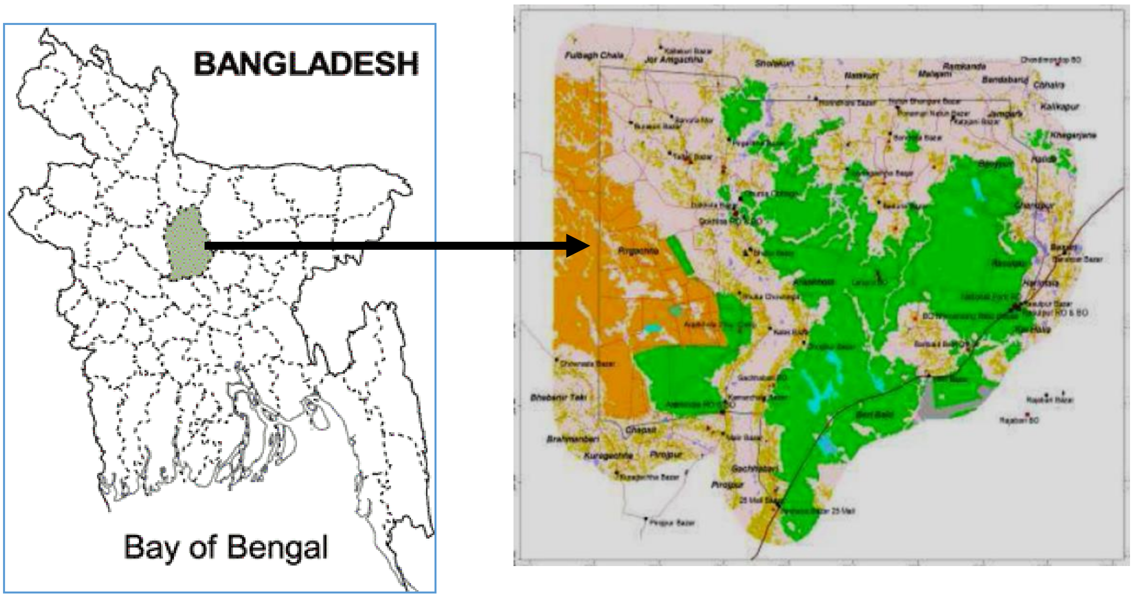
2 Methods

2.1 Study area

Sal forests consisted of about 0.12 million ha of the forests land of Bangladesh (FD 2013; Islam and Sato 2012a), which is distributed over the relatively drier central and northwest region of the country. About 86% of Sal forests situated at the central part of Bangladesh and Madhupur Sal forests exists the majority (46%) of the Bangladesh's Sal forests (Islam and Sato 2012a; Muhammed et al. 2008). This study was located at the Madhupur Sal forests, which is situated under the districts of Tangail and Mymensingh (Figure 1).



Source: CEGIS (2009); Islam and Sato (2012a)

2.2 Sampling and data collection

Under the small scale forest management concept, four types of people oriented forestry programs were launched in the Madhupur Sal forest area: (1) Woodlot, (2) Agroforestry, (3) Sal coppice management and (4) Buffer zone management (Islam and Sato 2012a). Unfortunately, the Sal coppice and buffer zone management programs were stopped by the FD due to malfunction and negative impact on forest conservation. Therefore this study only included the woodlot and agroforestry programs to assess the economic outputs and rural development of the participating people referred to as 'participants'. To determine the objectives this study relies on in-depth interview and randomly selected equal number of ethnic and non-ethnic participants in order to get information of woodlot and agroforestry programs. In total 40 participants were randomly selected for in-depth interview. To calculate the total income from agroforestry and woodlot programs the study also considered participants own consumption units of products together with selling units as in Taka (local currency, and 1 USD ≈ 80 Taka). Finally, chi-square test was carried out to compare the two programs.

3 Results and Discussion

3.1 Economic outputs

Out of four small scale forestry programs, only woodlot and agroforestry models were treated as successful or income generating programs in the Sal forests area. In general, benefit sharing process and tenure rights were similar for both programs. However, the tree plantation, crop cultivation area and techniques were significantly differing in woodlot and agroforestry model. Figure 2 clearly shows the ten year (duration of each program) details income generation activities from trees and crops components of woodlot program. The initial stage (first 3 to 4 year) of woodlot program, the crop income was good and it decreased with the increase of production cycle-year, and the participants received a major returned at the end of the program cycle (10-year). That means the regular cash flow was only visible at the first couple of year of woodlot production cycle (Figure 2).

On the other hand, the agroforestry program gave a regular cash flow or income generation to the participants during the ten-year cycle (Figure 3). The crop income was remaining more or less similar throughout the whole program cycle. Like woodlot, the participant had received a good amount of income from selling timber products in agroforestry at the end of program cycle (Figure 3).

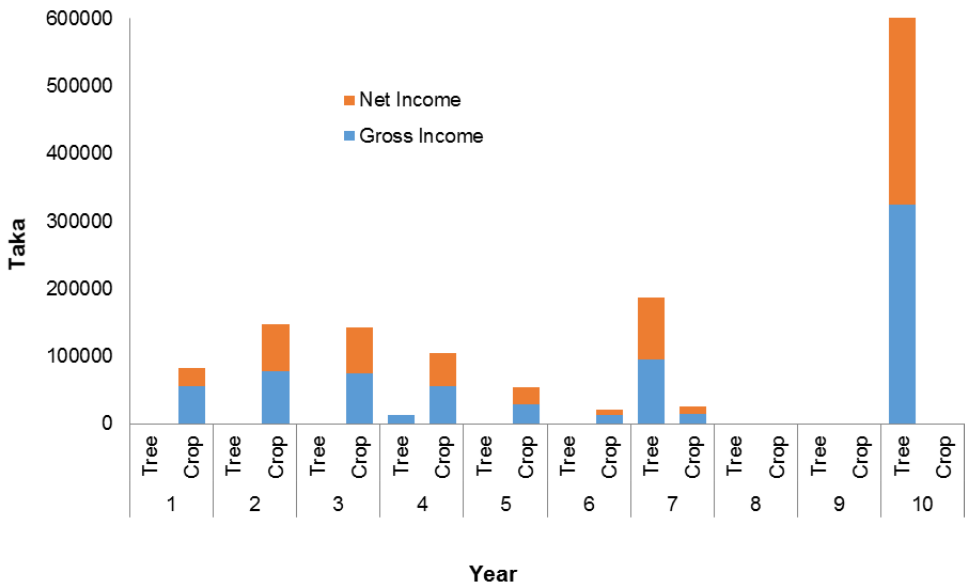


Figure 2: Year-wise tree and crop income of woodlot program

Source: Field Study (2011)

3.2 Income differences between the two programs

Analysis of participants' tree and crop income gave the results that total number of crop income was always higher in agroforestry program, whilst the tree income was higher in woodlot program (Table 1). The net income showed that agroforestry had facilitated much better return than woodlot. The differences of crop and tree income were significantly varied in woodlot and agroforestry programs, and in the case of total income the results visualized that agroforestry was profitable for participants. Every participant gave the same opinion during the survey time and the results also showed that on an average each agroforestry participant received 20,925 Taka more than on woodlot participants per year (Table 1).

Moreover, chi-square test represents that the higher the chi-square value, the greater the probability that there really is a significant difference between the two program output in respect of crop, tree and total

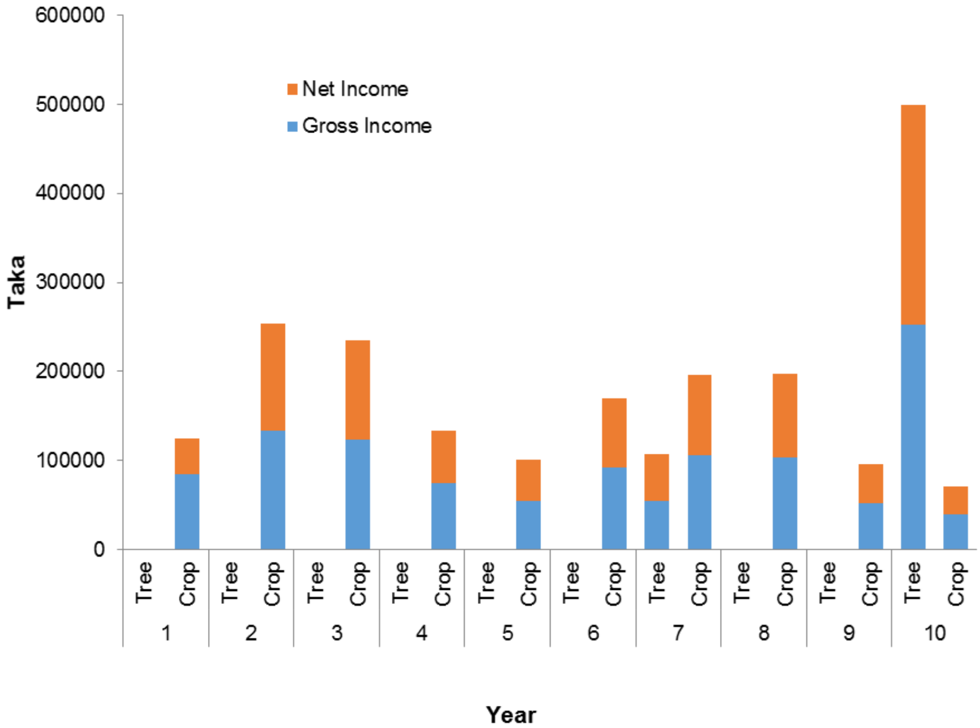


Figure 3: Year-wise tree and crop income of agroforestry program

Source: Field Study (2011)

Table 1: Comparative financial output from agroforestry and woodlot programs

Parameters	Agroforestry	Woodlot	Differences	χ^2	p
Crop Income (‘000’Taka)	14,764	8,396	6,368	38.00	0.378
Tree Income (‘000’Taka)	3,651	5,834	2,183	31.33	0.500
Crop income % of total income	80.49	58.34	22.15	--	--
Tree income % of total income	19.51	41.66	22.15	--	--
Total income (‘000’Taka)	18,415	14,230	4,185	28.00	0.621
Mean annual income (Taka)	92,075	71,150	20,925	--	--

Source: Field Study (2011)

income. However, among the tree income, the chi-square value is higher in crop income (Table 1) which revealed that the crop income between two programs varied significantly (George and Mallery 2006). On the contrary, the variables (different income) are not significance at 1% or 5% level.

3.3 Rural developments

The study revealed that most of the participants had received training from people oriented forest management (PF) programs which intern enhanced the capacity development and leadership ability of the participants. In addition to this, PF programs had created awareness of participating people which ultimately improves their family health care systems (Islam and Sato 2012a). The study also observed that a sense of collective action was grown among the participants and collective action are treated as a powerful tool for sustainable forest management and rural development (Islam and Sato 2012a; Nath and Inoue 2010). Because of PF programs income most of the participants had bought some valuable appliances (like radio and television) in comparing with other poor people of the community. That means these programs were successfully improve the living standard of the participants. The study also revealed that the natural resources like livestock and number of trees per household have been increased. In a recent strategy of Forest Department, every participants have to plant at least 200 native timber species per household and it created enormous awareness on species conservation among the participants and local communities. Moreover, the participants had build-up a good relationship with the local people of the community that did not take part in PF or other small scale forestry programs. The income from small scale forestry programs also played an important role during the participants' family crisis or in the context of vulnerability (Islam and Sato 2012a). For example, in PF programs, poor participants have been organized themselves to build the village common roads with their own contributory labor. These roads structure are very helpful to carry their PF products to the main market. Some GOs and NGOs involved in the study area were also allocating easy loan facilities to the participants which enhance rural development. In addition, participants were spending income to their family wellbeing even in some cases to the better education systems of their children. Therefore, all of those positive achievements related to small scale forestry programs have collectively attributed rural development in the study area.

4 Conclusions

The finding of this study concludes that both the small scale forestry programs have the ability to augment participant household income and also able to meet the subsistence. In a broad sense, both programs have the similar strategies to conserve forest resources and development. However, the economic analysis of the two programs revealed that woodlot program was better for tree outputs, and crop production was higher in agroforestry program. In general, the net income was high in agroforestry program. Therefore, through the small scale forestry programs, generally, income has increased and therefore, the participants have enjoyed better living standard than before. Participants have also created a social network and it helps to conserve common resources. So, effective government policy and proper implication of small scale forestry programs to the rural area will ensure economic outputs, conserve forests and it ultimately improve the rural area.

Acknowledgements

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[PS19]

Study on deforestation and forest degradation on forest concessions in Indonesia; A case study in the three provinces: East Kalimantan, South Kalimantan, and South-East Sulawesi, Indonesia

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Abstract. Indonesia is among the top three countries with the highest deforestation rate. Deforestation and forest degradation have been pervasive problems for forest resources of the country. In 2007, the Indonesian Ministry of Forestry (MoF) introduced 'community- based plantation' (*HutanTanaman Rakyat – HTR*), a new forest concession scheme that is designed on degraded forest areas and aimed at improving locals' participation in forest management. However, the effectiveness of HTR in support of conservation program is questioning.This study focused on three provinces of Indonesia; East Kalimantan, South Kalimantan and South-east Sulawesi (SE Sulawesi). Land cover between 2000 and 2009 was analysed to quantify forest degradation and deforestation rates within forest concessions. The results indicated that degraded and deforested areas occurred within forest concessions, including in HTR. In South Kalimantan, 43% of secondary forests deforestation was located within forest concessions, 14% of which was located within HTR. Degraded areas in East Kalimantan occurred 61% within forest concessions, and deforested areas in this province occurred 37% within forest concessions. In SE Sulawesi, degraded and deforested areas occurred within forest concessions: 24% and 29% respectively. This study revealed that sustainable forest management in Indonesia is lacking. A policy reform on forest land use policy is urged to be enacted in support of sustainable forest management.

Key words: deforestation, forest degradation, Indonesia, forest concessions, community- based plantation

1 Introduction

Indonesia, the third largest tropical forest country with ± 131.3 million ha of terrestrial forests (MoF, 2008), also has the second highest deforestation rate among tropical countries (FAO, 2010). Nearly 2 million ha of forest area are disappearing annually in Indonesia (Global Forest Watch, 2010) and the rate peaked at 3.5 million ha per year between 1996 and 2001 (BAPPENAS, 2010). Between 2000 and 2005, Brazil and Indonesia contributed 55% of the global emissions rate from tropical deforestation (Harris et al.,

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In Indonesia, between 1990 and 1996, the main causes of deforestation were agriculture, transmigration and the timber industry (Sunderlin & Resosudarmo, 1996). Between 1996 and 1999, illegal logging, mining expansion, poverty, global financial crises, and forest fires were believed to be the main causes (Contreras-Hermosilla, 2000; Sugardiman, 2007; Sunderlin, Angelsen, Resosudarmo, & Dermawan, 2001). Starting in 2001, most research showed that agricultural plantation expansion was the major cause of deforestation in Indonesia, and the latest research in 2010 and 2011 indicated that on top of the aforementioned causes, deforestation in Indonesia was also caused by plantation development, especially oil palm plantation and pulpwood production (Broich et al., 2011; Verchot et al., 2010). The direct and underlying causes of deforestation are clear and both cannot be excluded; however very few direct quantitative studies have been done to relate and quantify deforestation to particular direct and underlying causes (Gao, Skutsch, Masera, & Pacheco, 2011) especially to the forest concessions activities.

Forest degradation in Indonesia has also negatively affected the sustainability of the forestry sector in the country. Forest stock in Indonesia is decreasing by 6% per year and only one- third of this is caused by deforestation (Murdiyarso et al., 2008). In Indonesia, logging activities are believed to be the single largest contributor to forest degradation. Other contributors have never been quantified as monitoring forest degradation is a difficult task, even by remote sensing or by systematic forest inventory (Murdiyarso et al., 2008).

The aims of this study are to quantify the deforestation and forest degradation rates between 2000 and 2009, and to quantify how much each of the forest concessions activities: natural forest concessions, industrial plantation concessions and community-based plantations, contributes to deforestation and forest degradation in three provinces of Indonesia; East Kalimantan, South Kalimantan, and SE Sulawesi.

2 Definition, Materials and Methods

2.1 Definition

The term deforestation adopted in this study refers to the United Nations Framework Convention on Climate Change (UNFCCC) definition on deforestation as the direct, human induced conversion of forested land to non-forested land (FAO, 2003). Deforestation in secondary forests was the focus of this study as the majority of deforestation occurred in secondary forest. The term forest degradation refers solely to the change of primary forests to secondary forests over the period of time. The changes are indicated by the land cover maps of Indonesia obtained from the Indonesian Ministry of Forestry (MoF).

2.2 Materials

Spatial data (vector data) was obtained from MoF, includes district boundaries, land cover in 2000 and 2009 and land uses (forest concessions): natural forest concessions, industrial forest concessions and community-based concessions, Non-spatial data was obtained from the National Statistic Agency (BPS) and Forest Service Offices (Kantor Dinas Kehutanan Provinsi) in the three provinces studied. Data includes geographic conditions.

2.2 Methods

A national land use classification was aggregated into 10 different land use classes (Figure 1). Land cover year for the years 1990, 2000 and 2009 using ArcGIS ver. 10, a GIS software, was analysed to locate degraded and deforested areas and to produce land use matrix. Forest degradation and deforestation rates were determined as well as the proportion of each of forest concessions activities to forest degradation and deforestation was also quantified using the same vector data.

No.	Indonesia National Standard		This Study (New Aggregation)	
	Code	Class		
1	2001	Primary Forests	Primary Forests	1
2	2004	Primary Mangrove Forests		
3	2005	Primary (Peat)Swamp Forests		
4	20041	Secondary Mangrove Forests	Secondary Forests	2
5	20051	Secondary (Peat)Swamp Forests		
6	2002	Secondary Dryland Forests		
7	2006	Plantation Forests	Plantation Forests	3
8	2007	Bush/Shrub	Bushland	4
9	3000	Grassland		
10	20092	Mixed-Dryland Agriculture	Agriculture	5
11	20091	Dryland Agriculture		
12	20094	(Fish)Pond		
13	20093	Paddy Field	Paddy Field	6
14	2014	Barren Land	Mining Areas	7
15	20141	Mining Areas		
16	2010	Crop Plantation	Crop Plantation	8
17	2012	Housing/Built-up Area	Settlement	9
18	20122	Transmigration Areas		
19	20121	Airport		
20	5001	Water Body	Others	10
21	50011	(Peat)Swamp		
22	20071	Swamp/Shrub		
23	2500	Cloud covered areas		

Figure 1: Land use classes for this study

3 Results and Discussions

3.1 Results

The rates of forest degradation and deforestation from 2000 to 2009 varied among the three provinces studied. East Kalimantan has high rates of forest degradation and deforestation compared to

South Kalimantan and SE Sulawesi. In South Kalimantan and SE Sulawesi the rates of forest degradation and deforestation decreased from 1990 to 2009. However, in the timber-rich province of East Kalimantan, where 70% of the area is still forested, the rates of forest degradation and degradation increased between 1990 and 2009. Table 1 presents the rates of primary forest degradation and secondary forest deforestation between 1990 and 2000 and 2000 and 2009 in all three provinces.

Table 1: Primary forest degradation and secondary forest deforestation

Province	1990 and 2000				2000 and 2009			
	Degraded areas (Ha)	Degraded areas (%)	Deforested areas (Ha)	Deforested areas (%)	Degraded areas (Ha)	Degraded areas (%)	Deforested areas (Ha)	Deforested areas (%)
South Kalimantan	479,649	74	675,224	60	1,269	2	125,669	15
East Kalimantan	646,987	8	754,851	11	1,208,167	16	792,566	12
SE Sulawesi	276,006	24	209,015	18	53,357	6	58,072	5

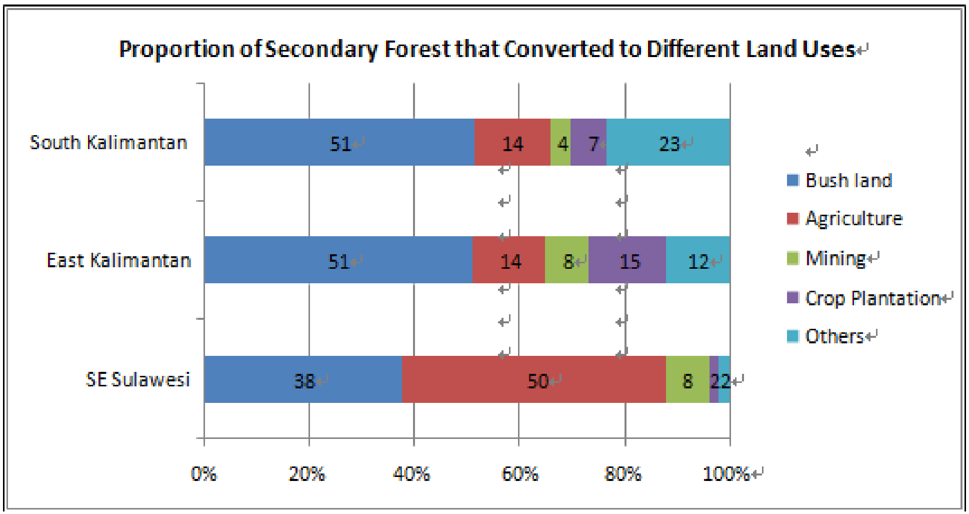

Figure 2: Proportion of secondary forest converted to different land uses

Table 2: The proportion of forest degradation in forest concessions

Province	Primary forest degradation (Ha)	Rate of primary forest degradation (%)	Proportion of primary forest degraded areas that occurs in forest concessions			
			Natural (%)	Plantation (%)	Comm-based (%)	Total forest concessions (%)
South Kalimantan	1,269	2	0	0	0	0
East Kalimantan	1,208,167	16	50	9	2	61
SE Sulawesi	53,356	6	4	0	20	24

Table 3: The proportion of secondary forest deforestation in forest concessions

Province	Secondary forest deforestation (Ha)	Rate of secondary forest deforestation (%)	Proportion of secondary forest deforested areas that occurs in forest concessions			
			Natural (%)	Plantation (%)	Comm-based (%)	Total forest concessions (%)
South Kalimantan	1,269	2	11	18	14	43
East Kalimantan	1,208,167	16	21	16	0	37
SE Sulawesi	53,356	6	0	0	29	29

In all three case study locations, between 2000 and 2009, most degradation is of primary forests degraded into secondary forests, while deforestation is secondary forests deforested into different land uses including bushlands, agriculture and crop plantation (see Figure 2). The dynamics of forest degradation and deforestation in South Kalimantan, East Kalimantan and SE Sulawesi are different. Overall, 43% of deforestation in South Kalimantan occurred in forest concession areas; 61% of forest degradation and 37% of deforestation in East Kalimantan occurred in forest concessions; and 24% of forest degradation and 29% of deforestation in SE Sulawesi occurred in forest concessions. Table 2 and Table 3 present the proportion of primary forest degradation and secondary forest deforestation in different forest concessions activities.

3.2 Discussion

The President of Indonesia in 2012 claimed, that for the last 10 years, the deforestation rate in the country has been decreasing to a maximum of 0.5 million ha when compared to the period of 1997 – 2003 when the rate peaked at 3.5 million ha per year (BAPPENAS, 2010; Mahamel, 2012). The country's performance in decreasing the rates of forest degradation and deforestation has been acknowledged by FAO, the international organisation that is responsible for conducting global forest monitoring. FAO has recognised that Indonesia has succeeded in decreasing its forest degradation and deforestation rates (FAO, 2011). However, the national aggregation figure has concealed the high rates of forest degradation and deforestation at the provincial level, particularly in the timber-rich provinces of Indonesia. This study confirmed that in a province like East Kalimantan, which in 2009 still had 70% of its total land in forested areas, the rates of forest degradation and deforestation have been increasing over 1990 – 2009 (see Table 1). For provinces which had forested areas of less than 55% in 2009: South Kalimantan and SE Sulawesi, the rates have been decreasing from 1990 – 2009. However, the decrease in these rates has little relationship with reforestation program that have been initiated by MoF extensively since 2001. Between 2000 and 2009, a maximum of 10,767 ha in South Kalimantan, 61,712 ha in East Kalimantan, and only 186 ha in SE Sulawesi have been reforested. This is small area when compared to degraded and deforested areas for the same period of time. Successful reforestation programs in Indonesia are not common and targets are under-achieved (Alimuddin, 2012; Korowotjeng, 2007; Noordwijk et al., 2007; Siregar, Rachmi, Massijaya, Ishibashi, & Ando, 2007), therefore, forest resources of this country remain prone to degradation and deforestation for the next decade, especially if the GoI does not improve the performance of current intervention programs.

Between 2000 and 2009, direct causes of forest degradation in South Kalimantan and SE Sulawesi involved small agent that is community-based license holders, while forest degradation in East Kalimantan was more related to a combination of large and small agents such as big companies of natural forest concessions and industrial plantation concessions holders and locals who participated in community-based concessions. This explains a high rate of forest degradation in East Kalimantan. Deforestation in all three case studies was a combination of small and large agents. A high proportion of forest degradation and deforestation occurred in forest concessions including in community-based concession indicated that the inadequate forest monitoring takes place and that a low level of law enforcement has been implemented. Poor monitoring program and the lack of enforcement on forest land use policy triggered the license holders adopting unsustainable practices. Specific to community-based plantations, lack of assistance from the government during the first stage of establishing plantation, a crucial period when income generated from timber resources not available yet to support daily necessities (Noorwijk et al., 2007), triggered the locals to encroach to the nearest forest areas in order to survive. Without corresponding changes in the attitudes and practices, overcoming forest degradation and deforestation in Indonesia will be impossible (Barbier & Burgess, 2001; Dauvergne, 1994). It is clearly seen that to mitigate and to halt forest degradation and deforestation in Indonesia is challenging.

4 Conclusion

This study concluded that sustainable forest resources management in Indonesia is lacking. The rates of forest degradation and deforestation between 1990 and 2009 in the timber-rich province such as East Kalimantan increased, although the national figures are decreasing; high proportion of forest degradation and deforestation are associated with forest concession activities. Policy reform is needed to conserve the remaining forest resources of Indonesia.

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[PS20]

Roles of women in Community Collaborative Forest Management in Glandang Village, Pemalang Regency, Central Java, Indonesia

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1 Introduction

In 2001, the State Forest Company (SFC) initiated Community Collaborative Forest Management (CCFM) to manage state forests in cooperation with rural communities. Gender and human diversity have been identified as crucial to the success of CCFM. However, social attributes, such as gender, wealth, age, ethnicity, migration status, and religion, can confer systematic disadvantages related to difficultly for some groups and individuals to access public and private mechanisms of resource allocation or decision making (CIFOR, 2012). Factors that determine women participation are critically important because forestry reforms in many developing countries explicitly aim at including the marginalized groups in decision-making processes, such as forest management (Mai et al., 2011).

The roles of women in state forest management have been explored in previous studies (Widayanti, WT 2001; Kusumanto, Y et al. 2001). However, these studies have focused on other forest management systems, such as community forestry/HKM and Optimal Teak Forest Management/PHJO. The roles of women in CCFM remain to be delineated. The objective of this study is to clarify the roles of women and their decision-making process in CCFM.

2 Research Method

Both literature reviews and field research were conducted in this study. In-depth interviews with key informants and field survey were carried out in Glandang Village, Pemalang Regency, Central Java. Glandang Village was selected as the research site because it was recognized as provincial winner of a gender-based community empowerment program (P2MBG) in 2005. Table 1 provides a profile of Glandang Village.

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Table 1: Profile of Glandang Village

Total Area (ha)	648.0
PHBM Area (ha)	702.1
Population (person)	3,028 (women 49.9%, men 50.1%)
Education level	Elementary school 62.0%

Source: Document profile of the village, 2013

3 Results and Discussion

3.1 Household Level

Interviewees offered various reasons for managing state forest areas, and management roles changed over time. For example, Siti Fatimah is one of the landless people in the village. She discussed the difficulties of combining both household chores and responsibilities related to state forest management. Siti Fatimah said,

"It's hard for me because I'm always thinking about my house. I need to still have a clean house, and I have to take care of my children. Meanwhile, my husband works in Jakarta as a laborer. I stay up until one o'clock in the morning doing laundry and preparing breakfast and lunch for the next day. I have three children; two are in elementary school and need much more money for their education. One of my children lives with me full time."

Fatimah's multiple roles at home and in the forest are challenging. She feels conflicted on maximizing her time. Fatimah's story supports the argument of Widayanti (2001): women are critical to the survival of forests because they concurrently engage in forest management and maintain more traditional roles at home. They go to the state forest area every day to perform tree maintenance and engage in agricultural activities. The yield of their agriculture activities is used for subsistence consumption. Thus, they benefit from forest products as alternative sources of income.

In contrast to Fatimah, Wartiah is a member of the Richland people. Although she has forest activities to attend to every day, she has another source of income, that is, from her land ownership. If her husband cannot be home, she could hire laborers to clear the land clearing and plant trees in the area of the state forest under her management.

Women generally have two roles: reproductive and productive roles. Meanwhile, men only have a productive role. Results of previous studies suggest that, initially, the field of forestry is a man's area. However, as deforestation continues to plague forests, these roles have changed over the years; the roles of women in forestry activities have increased. Women work in the forestry sector, and men work outside the home. Men from marginal (poor) households who work in farms tend to leave farm work for employment in the non-agricultural sector (off-farm). As such, the labor burden of women increases; women are not only responsible for reproductive activities but also farm work.

Table 2: Daily activities of Siti Fatimah

No	Time	Activity
1	04:00	Wake up
2	04:00–04:30	Make breakfast and lunch
3	04:30–04:45	Clean the house
4	04:45–05:00	Do laundry
5	05:00–12:00	Agriculture activity/forestry activity and take care of children
6	12:00–13:00	Rest
7	13:00–16:00	Agriculture activity/forestry activity and take care of children
8	16:00–17:00	Collect fodder
9	17:00–18:00	Collect firewood
10	18:00–18:30	Clean cattle pens
11	18:30–19:30	Make dinner
12	19:30–21:00	Take care of children
13	21:00–21:30	Clean the house
14	21:30–22:00	Spend time with family
15	22:00	Sleep

Source: Field survey, 2013

Table 3: Land ownership of respondents

Land Ownership	Persons	Average land ownership (m^2)		
		Home garden	Paddy field	Total
Landless	13	55.7	52.0	107.7
Middle	4	653.5	848.5	1,502.0
Richland	3	4,035.3	3,166.7	7,202.0

Source: Field survey, 2013

Women are involved in developing plans and decision making at the household level. However, household decision making is mutually performed by husband and wife. Decisions include determining the type of crops to cultivate, planting costs, and scheduling of activities. Deliberation in the household has been done since the olden days. This system has helped ensure good household management and avoid conflicts. The involvement of women is also very high in direct forest management. With regard to management, women are engaged in growing seedlings, land preparation, planting, and weeding. Women in Glandang Village devote more time on land compared with men. Given the considerable role women play in reproduction, they actively participate in forest management in the village to supplement the household income, which mainly comes from the work of husbands in the industrial and construction sectors.


Figure 1: Forest management activities of women

Source: Field survey, 2006

3.2 Community Level

The findings showed that the division of roles in CCFM was flexible, and both genders had rights to access to and use forest resources. All respondents said that women were always involved in forest management activities. Women members at the community level and all household heads (women and men) work together as partners. Women constitute 49.9% of the population of Glandang Village and play a very crucial role in the development of society at all levels. Unfortunately, they function from a subordinate position inherent in both traditional and village institutions. Women empowerment is currently an issue in forest village community institution (FVCI). FVCI has about 220 women members (40%). However, men dominate the board of directors in forest management, which is consistent with Javanese culture. Likewise, community decision making is dominated by men.

Table 4. Women's activities

No	Activities	Time (1 day = 24 hours)																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
POF Management																									
1. Seasonal Activity																									
1	Nursery (July - August)								■	■	■	■													
2	Land clearing (April - May)						■	■	■																
3	Planting (Sept - Dec)					■	■	■	■	■	■	■					■								
4	Forest maintenance									■	■	■		■	■	■									
2. Daily Activity										■	■	■		■	■	■									
1	Agriculture activity								■	■	■	■		■	■	■	■								
2	Collect fodder.																	■	■						
3	Collect firewood																	■	■						
Non POF Management																									
1	Cooking				■															■					
2	Cleaning house				■																	■			
3	Take care of Children									■	■	■	■			■	■			■	■				
4	Washing clothes				■																				
5	Cleaning cattle pen																			■					

Source: Field survey, 2013

Attending meetings, frequency of attendance to meetings, speaking up at meetings, or holding official positions in forest committees are among the indicators of participation in forestry settings; in turn, these reflect the level of involvement and engagement of participants (Agarwal, 2001). In Glandang Village, the roles of women members in the community as well as in the related forestry sector are the same as those reported in Agarwal (2011), although women in Glandang Village spend more than 4 hours/days in the forestry sector.

Figure 2: Forest management activities of women
Source: Field survey, 2013

4 Conclusion

A significant finding is that these women in Glandang Village play important roles in forestry management under CCFM. For some women, forestry has a major benefit. Meanwhile, the irregular lifestyle hinders their involvement, particularly when women are involved both in forest maintenance and in household work. The state forest area is more important for women from landless households. Women participation in decision making and in holding responsible posts in forest management is important to the success of CCFM. Therefore, SFC and men should recognize role of women in CCFM.

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[PS21]

Managing Forest and Watershed in Indonesia by Community-based Forestry Actions

A case study of SCBFWM (Strengthening Community-Based Forest and Watershed Management) project

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1 Introduction

Community forestry is neither a new concept nor a new practice. It represents as a traditional and longstanding approach to managing human interactions with forestlands and resources, common in developing regions and among the indigenous societies of developed regions (Poffenberg 1990). It basically connotes heightened local control and local benefits, as well as local knowledge and technical inputs and can include small private holdings such as family forests and farms, local government owned forests and/or situations in which communities and/or non-government organizations share in decision-making and benefits through co-managing public forests with senior governments (Danks 2008). Community-based forestry usually involves communities and their allies collaboratively interacting to increase their involvement in sustainable public forestland management (Belsky 2008). However Bullock and Hanna (2012) note that defining a role for communities in managing local forest is a challenge for government, agencies, forestry professionals, firms and communities themselves.

Despite more than three decades of Community Forestry development as a concept and practical implementation, past and current Community Forestry management practices have failed to improve the livelihoods of forest communities (Nawir 2012). As well as in Indonesia, forestry development has faced a big problem in implementing sustainable forest management through community-based forestry development program because many programs are neglecting social, economic and cultural aspects of community and also lack of community involvement. Therefore, this paper aims to analyze project strategies for developing positive policies, institutional capacity building with local wisdom and gender mainstream, provide participatory and multi-stakeholders approaches, and the action by community-based forestry through Strengthening Community-Based Forest and Watershed Management (SCBFWM) Project in Indonesia.

2 Community-Based Forest Management (CBFM) Models in Indonesia

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Based on the data from Ministry of Forestry, Republic of Indonesia in 2012 (Table 1), Forestland in Indonesia is divided into conservation forest (19,19%), protected forest (23,66%), limited production forest/HPT (16,76%), production forest (25,32%), and convertible production forest (15,32%) with total forestland 136,174,000 ha.

Table 1: Forest area by forest category in Indonesia

Land Forest	**Size (thousands of ha)**	**%**
Conservation forest area	26,127	19,19
Protected forest area	32,212	23,66
Production forest, divided into 3 categories:		
a. Limited production forest (HPT)	22,818	16,76
b. Production forest (HP)	34,142	25,07
c. Convertible production forest (HPK)	20,875	15,32
Total	**136,174**	**100**

Source: Ministry of Forestry (2012)

In Indonesia, a social forestry program has been implemented since the Mataram Kingdom at 18th century at Java Island in the form of agro-forestry. As well as the community in outside Java has been doing shifting cultivation as a traditional and heritage forestry systems (Effendi 2000). Furthermore, in 1978, International Forestry Congress held in Jakarta with theme `Forest for People` had triggered the intensive development of social forestry in Indonesia. The government started to issue a policy known as Forest Concession-Village Development Program (HPH Bina Desa) through a Forest Minister Decree number 61/Kpts-II/1991 which was later replaced by Forest Village Community Development Program (PMDH) through a Forest Minister Decree number 65/Kpts-II/1995. The government has launched other policies related with community forestry (i) Forest Minister Decree number 318/Kpts-II/1999 regarding community participation in forest management and (ii) Forest Decree number 31/Kpts-II/1999 for distributing forest concessions less then 50,000 ha to the community (Subarudi *et al*. 2004). However, these policies have failed to improve and empower the livelihoods of communities because the program seems to be formulated as a formal response without considering field implementation requirement and lack of community involvement. In 2002, government has released government regulation (PP) number 34/2002 on forest systems, forest management plan, forest utilization and forest land use. This policy is becoming new community approach to implement many CBFM programs. Community, as the main actor in CBFM model implementation has important roles in decision level on forest management to manage forest utilization, which is not only for producing timber as the main product but also providing non-timber forest products such as rattan, honey, fruits, traditional hunting for non-protected animals and recreation.

3 Strengthening Community-Based Forest and Watershed Management (SCBFWM) Project in Indonesia

Forestland degradation will make adverse impact for watershed such as soil erosion, water erosion, water pollution and declination of soil fertility. Therefore, Government of Republic Indonesia is taking action with inter-sectoral coordination and collaboration with local and regional stakeholders to maintain forest ecosystems and watershed functions and to reduce the degradation process while also providing benefits for forest-dependent communities through Strengthening Community-Based Forest and Watershed Management (SCBFWM) Project.

The Ministry of Forestry, Republic of Indonesia has been conducting SCBFWM project from 2009 to 2014. This Project has a grant from the Global Environment Facilities (GEF) with facilitated by the United Nations Development Programme (UNDP) with total amount of $195,000 in six provinces; Sumatera Utara, Lampung, Jawa Tengah, Nusa Tenggara Barat, Nusa Tenggara Timur and Sulawesi Tengah (figure 1). The main target of this project is supporting Indonesian Government to reduce land degradation and rehabilitate the watershed functions and environmental services. The outputs of the project are the followings:

1. Improved watershed / sub-watershed critical socio-economic and ecological conditions in project location
2. Government agencies provide clear and measurable support for the development program initiated by SCBFWM
3. Improved coordination between different levels of government and programs that consistently supports efforts to improve forest management and watershed

Figure 1: Location of SCBFWM project

Source: http://www.seasite.niu.edu/indonesian/budaya_bangsa/tmii/Peta_Indonesia.htm (edited by author)

Every watershed and sub watershed in 6 provinces has different characteristics. Those watersheds have been chosen as pilot locations because (i) biodiversity resources (ii) varying sets of thread and (iii) pressures from community as outlined in Table 2.

Table 2: Conditions of project pilot areas

Location	Name of the Watershed	Total Area (ha)	Conditions
Sumatera Utara	Sub-watershed of Gopgopan, Water catchment (DTA) of Toba Lake	12,511	a. Has functions as tourism destination, agriculture, irrigation, fisheries and water resources
			b. High risk for erosion
			c. Pressure due to development of agriculture expansion and tourism facility on surrounding slope which threatens protected areas
Lampung	Sub-watershed of Way Besai	97,672	a. High biodiversity including existence of rare and epidemic species i.e. sumatran tigers, elephant and sumatran rhinoceros
			b. Forestlands were converted for coffee plantations by community
			c. The protected forest was degraded due to encroachment and land conservation
Jawa Tengah	Sub-watershed of Tulis	13,000	a. Has steep topography, in combination with annual rainfall and high risk toward land degradation and soil erosion
			b. Pressure due to massive land conversion into agriculture land i.e. potato cultivation
			c. Biodiversity of flora and fauna are threaten due to encroachment
Nusa Tenggara Barat	Watershed of Jangkok	17,606	a. Erosion is really high with sedimentation level until 773,53 ton/ha/year
			b. Gunung Rinjani National Park and Grand Forest Park (Tahura) have been degraded because of encroachment
			c. Pressure due to development of agriculture expansion
Nusa Tenggara Timur	Sub-watershed of Besiam	73,810	a. High biodiversity of flora and fauna including 38 endemic flora and 32 bird species inside wet tropical vegetation forest
			b. Soil types are relatively sensitive with erosion
			c. Major threads are economic pressure such as livestock encroachment and uncontrolled forest burning
Sulawesi Tengah	Sub-watershed of Miu	70,534	a. Has functions as agriculture, fisheries, source of clean water and material for building construction
			b. Degraded due to forests conversion into agriculture lands
			c. Pressure due to bad farming practices

Source: SCBFWM (2010)

Several activities have been conducting to deliver the project involving three fundamental aspects; community, environment and government. The activities are including establishing Community-Based Forestry with the participation of women, workshop, training and capacity building. It is useful to enhance the technical competence of members, obtaining knowledge about SCBFWM by government staff who are trained and providing forum workshops and meetings for coordinating between and among levels of institutions / government agencies.

This project emphasizes local wisdom approach and gender mainstream in every activities. In Sumatera Utara, field facilitator always explain about *`Batak`* traditional customary from ancestors in every workshop to change mindset of local community about the importance of planting trees near watershed. In the *`Batak`* traditional customary, community should maintain the environment including forest, work together to plant and harvest agricultural commodities and if there is a problem, they will resolve it through discussion with community leaders or *partukkoan* (Sinaga, 2012). Moreover in Nusa Tenggara Barat, local community has traditions to protect the forest from various pressures. They have a customary institution called *`Lang-Lang`* as forest guards and will give social sanction to the person who breaks the law. Project development in activity level is also using gender mainstream to ensure women participation in planning, decision-making, implementing, monitoring and evaluating of the project.

4 Positive Results of SCBFWM Project

All the SCBFWM funds received as grant are transacted through Project Management Unit (PMU) established in national level. The PMU distributed funds based on community-consulted agreement. The SCBFWM funds are utilized in number of activities, which are illustrated in figure 2.

SCBFWM is an ongoing project, thus far the positive results of this project are forming Communities-Based Forestry (CBFs) integrated with agro-forestry system, improving women participation through the establishment of women CBFs from existing women groups in local area, improving six watershed/ sub-watershed conditions through rehabilitation and replanting for covering critical ecological area and developing local legal instrument through designing on environmental services incentive and forest management system.

Creating community organization for increasing social capital can be undertaken for decreasing environmental damages and improving community welfare (Engel and Palmer, 2006). Therefore the output project number 1 can be reached through forming CBFs and rehabilitation of watersheds. 78 CBFs have been established and revitalized to minimize encroachment and to protect forest near the watersheds. Trainings and capacity buildings to enhance the technical competence such as mapping area, land management and institutional reinforcement have provided by local facilitator and government. Livelihood issue is tackled by providing agro-forestry training and technical assistance for CBFs in every pilot area. Evaluation result in Nusa Tenggara Barat showed SCBWFM has increased community’s income from USD50/month in 2010 to USD800/month in 2012.

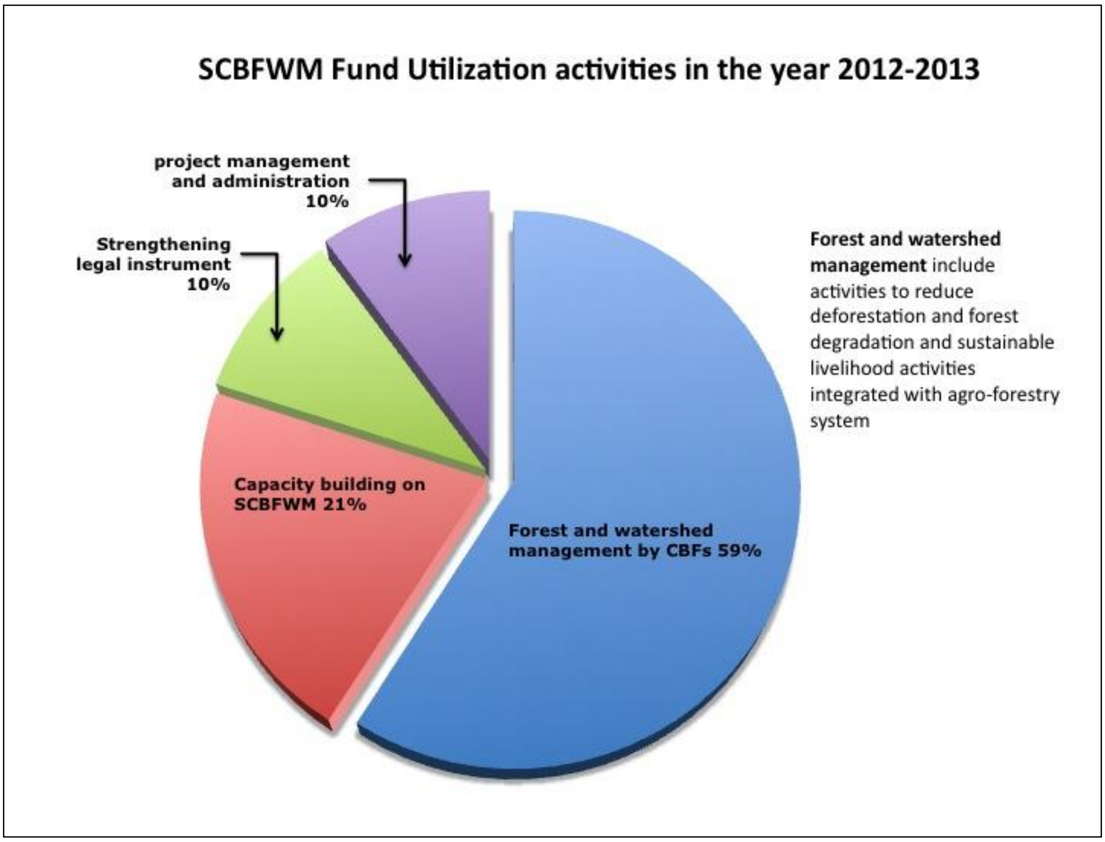

Figure 2: SCBFWM Fund Utilization Activities
Source: SCBFWM (2012)

Gender issues in the villages are becoming important for developing the project when both men and women play essential roles for protecting forest and watershed. Through this project, women participation has improved through the establishment of 10 women CBFs from existing women groups in local area, which started from social, and religion gathering called `arisan` and `penggajian`. Arisan is a social gathering that use form of rotating savings which takes place at a fixed interval, at each member's home in turn. Each member should pay the money to head of the group, then she will draw the member name to decide who is receiving the total money. The receiver will receive payment and provide food for those members on the next event. Moreover, pengajian is women gathering for sharing information or knowledge about Islam religion. Clearly, establishment of women group with this method is really effective because every woman knows the member that easier for them to build trust and sharing information.

Through this project, community-based forestry together with local government are improving six watershed/ sub-watershed conditions through rehabilitation and replanting for covering in 2,777 ha critical ecological area with total 1,111,000 seedling. Typical trees for rehabilitation and replanting are Jabon (*Anthocephalus cadamba)*, Suren (*Toona sureni*), Acacia (*Acacia auriculiformis*), *Eucalypthus* and Pine (*Pinus Merkusii)*.

Legal instrument is also important to improve the implementation for sustainability purpose. For instance, government developed legal instrument through designing on environmental services incentive and forest management system with their self-financial until $13,074,000. One of the existent positive policies is Peraturan Pemerintah (Government Regulation) of Republic of Indonesia Number 37 Year 2012 on watershed management including the meaning of watershed, classification and how to manage watershed. Local government also conducts formulation of local regulation such as in Nusa Tenggara Timur, village government formulated Peraturan Desa (Village Regulation) Number 1 Year 2010 on environmental management. Prohibitions to cut trees near watershed and catch fishes with illegal method in river are a few articles inside the regulation. The person who do not follow the regulation will get sanction; penalty payment for $ 100 and the person who report those legal activities to local government will be rewarded 10% from penalty payment. The purpose of reward is to set community as a subject who will monitor the forest. In fact, government provides clear and measurable support to protect forest and watershed as stated in the output project number 2 with those activities.

SCBFWM has been improving partnership and coordination between different levels in government, private company, NGO/INGO and community as the output project number 3. In sub-watershed of Way Besai, partnership has been established between PLN (State Electricity Company)/PLTA (Hydropower Center), Nestle Beverages Co, Indocapco Co, NGO Watala and CBFs. In watershed of Jangkok, partnership is WWF, WFP, ITTO, Department of Cooperative and Small and Medium Business, Department of Forestry and Department of Agriculture. Furthermore, partnership is also conducted in sub-watershed of Miu between PNPM, National Park of Lore Lindu, Department of Forestry and Department of Agriculture.

5 Discussions and Conclusions

Several program related to CBFs have already been implemented by Government of Indonesia for years but they failed to improve livelihood welfare. It is because of the prosperity approach program in forestry sector benefited the forestry institution, not the farmers (Effendi, 2000) The program was often identified inaccurately which could not make community self-reliance (Nasendi *et al*, 1996) and the implementation was not related with the community conditions and situation (Subarudi, 2000). Therefore, as the project goes nowadays, the successful factors are indentified by strengthening social institutions for managing forest and watershed in community, implementation of activities based on the condition and the situation in each pilot project and policy development from central to local level.

This paper demonstrated that local people has positive attitudes towards the project because it provides social and economic benefits. Strong local institutional systems are socially adaptable in here because the paradigm changes from government-based management to community-based management with involvement of community. Kellert *et al* (2000) pointed out the participatory of community was considered to produce increasing benefits for the local community, to make use of local knowledge and to contribute to sustainable forestry comprising economic, social and ecological benefits. Charnley and Poe (2007) also emphasized to link with community, attached to the surrounding forest, not only their daily livelihood but also cultural and religious lives. This project was using *arisan, pengajian, lang-lang* and *Batak* traditional customary to deal with community for developing social institutions. Furthermore, implementation of activities such as socialization, training, collaboration arrangement, capacity building and other technical assistances are based on the condition and the situation in each pilot. Especially Purnomo *et al* (2005) stated that each location has different types of collaboration with different arrangements among stakeholders. Consequently, the strategies can be designed and implemented according to the livelihood objectivities and local situation.

In Indonesia, the new policy on decentralization created the legal frame conditions for people's participation in the management of natural resources (McCarthy, 2000). The transfer of responsibility and authority over natural resources from central government to local level aims to address institutional problems that have been indentified as reason behind the degradation and exploitation of forest resources (Wibowo and Byron, 1999). So far, policy development from central to local level has been implemented in some pilot areas, which provide legal instrument in national and local level. For the rest area, project should mobilize CBFs to influence constitutional governance changes. However, CBFs also should be introduced about ecological, social and policy learning mechanisms. The preferred changes include increased community participation and access in public forest resources management decisions in order to protect and utilize forest in both of ecology and community livelihood aspect.

Following the successful factors of the project, however the implementation of SCBFWM project also has brought into various challenging issues. The challenges are community stigma that project has not given direct economic benefit because it is not giving quick financial returns, competition to get financial support in local level, lack of baseline data on forest encroachment and lack of coordinating in local level. For minimizing negative impact that lies ahead, raising awareness through training and workshop for local community about long-term benefit of the forest, financial transparency and involvement of stakeholders need to be done. Furthermore, strengthening the effort for coordinated project in local level is becoming priority for project sustainability. Common understandings between stakeholders are becoming critical point for minimizing different perception in order to achieve the objectives. This project also requires more actions from relevant government agencies such as modifications to local regulation. However, if the staffs have no initiative to action, it will be difficult for sustaining the project. Furthermore, incentives for successful program under this project for local government should be also considered because replication and scaling-up the successful project requires effort to assist communities.

This case introduce here is an ongoing project which demonstrate good collaborative network between community organizations and government with support from international organization. We realize, it is too early to say that the project has been enough successful. However, the project shows positive progress. It allowed stakeholders` participation in the process at various levels and improved community awareness for protecting the forest and watershed. We believe the effort of in-community self motivated activities will support this project to be better at the next stage as well as commitment of community to continue the management of the forest and watershed for longer term.

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[PS23]

The Role of Agroforestry System for Rural Development in Malilingin Village South Kalimantan, Indonesia

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Abstract

Agroforestry system is optimal land use system and sustainable, by combining forestry and agriculture on the same land management unit with respect to the condition of the physical environment, social, economic and cultural communities who participate. The research aims to determine the land use by people in Malilingin village, South Kalimantan for rural development. The method used is the approaches to the public by direct interview to the people in the villages around the forest. From interviews to the people in Malilingin village, they manage their own land by using agroforestry system where the main crop is the type of *Hevea brasiliensis* and communities combine with other types such as *Oriza sativa*, *Musa paradisiaca*, *Capsicum frutescens*, *Arachis hypogaea*, which is where most of the crop this interlude used as needs in the village while the *Hevea brasiliensis* itself sale as a livelihood. With such obtained results can be concluded that the agroforestry system is able to be an alternative way for people to survive and fulfill the needs of the village.

Keywords : *Agroforestry System, Rural Development, Optimal Land Use, Sustainable, Malilingin Village*

1 Introduction

Agroforestry developed for member benefits to humans or to improve the welfare of society, especially agroforestry is expected to help optimize the outcome of a sustainable form of land use in order to ensure and improve the people's living needs and can increase the carrying capacity of human ecology, especially in the rural areas to the tropics, some problems (economic and ecologi) following the mandate of agroforestry in the solution among others is to ensure and improve food needs are defined as follows

1. Increase the supply of both annual and seasonal food and improve the nutritional quality
2. Product diversification and reduction of risk of crop failure
3. Assuredness sustainable food

In Indonesia, the 10-year period (2000-2010) the population growth rate increased by an average 1.49% per year. This figure indicates the amount of food that should be available. In the 1960s, per

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capita rice consumption of the people of Indonesia about 130 kg / year. However, the average Indonesian rice consumption increased to 139.15 kg / year during the period 2006-2009. This value is above the average world rice consumption is 60 kg / year (republika, 2010). Needs a big if not offset increased food production, will face serious problems. In order to meet national food needs, the government set a target that is relatively much higher in 2014. Ministry strategy plan pertanian2009-2014 set a target growth rate of production of major food commodities as follows:

1. Rice production growth rate of 3.22%
2. Corn production growth rate of 10.02%
3. Soybean production with a growth rate of 20.05%
4. A growth rate of sugar production with 12.55%
5. Beef production with a growth rate of 7.30%
   (Ditjentan, 2010a, 2010b, 2010c)

One alternative is to increase production by extending the pattern utilizing forest land with development of agroforestry systems. Under a presidential decree No.83 of 2006 concerning food security council, ministry of forestry is one sector which is partly responsible for food security. At present, the contribution of the forestry sector in national food availability reached 3.4 tons per year for rice, corn, soybeans, . The increase crop intercropping (agroforestry) and the provision of forest land for the development of food continues to be done as a form of commitment to the forestry sector in supporting food security.

2 Objective

The objectives of this research writing, as follows:

1. Knowing the condition of availability of food in the Malilingin village
2. Determine the extent of the role of agroforestry in supporting rural development.

3 Methods

The research was conducted in January 2013 in the village malilingin, district central headwaters, South Kalimantan which the authors used data collection methods are as simple as collecting a few people who own land around the forest and then interviewed them in depth about the benefits of the use of agroforestry systems they use in land use

4 Result and Discussion

From the observations and interviews conducted in this research note that the forest dwellers residing in the village malilingin, south Kalimantan using agroforestry systems in land use.

Table 1: Interview results to the public

No	Name	Sex	Age	Number of dependents	Job	The last education	average income
1	Mahyuni	Male	53 Years	2 person	Farmer	ES	Rp 3.500.000
2	Hayatudin	Male	62 Years	2 person	Farmer	ES	Rp. 2.500.000
3	Haliadi	Male	58 Years	2 person	Farmer	ES	Rp. 3.000.000
4	H. Tubil	Male	58 Years	6 person	Farmer	ES	Rp. 3.000.000
5	H. Darsi	Male	55 Years	3 person	Farmer and fisherman	ES	Rp. 3.000.000
6	Aspiani	Male	58 Years	5 person	Farmer	ES	Rp. 2.000.000
7	Rahmat Efendi	Male	50 Years	3 person	Farmer	ES	Rp. 1.500.000
8	Armansyah	Male	60 Years	5 person	Farmer	ES	Rp. 1.000.000
9	Darpini	Male	65 Years	3 person	Farmer	ES	Rp. 1.700.000
10	H. Ramli	Male	40 Years	2 person	Farmer	ES	Rp. 2.300.000
11	H. Jasran	Male	59 Years	5 person	Farmer	ES	Rp. 1.500.000
12	Syarkani	Male	68 Years	2 person	Farmer	ES	Rp. 2.000.000
13	Antung	Male	52 Years	3 person	Farmer	ES	Rp. 2.50.000
14	Mastur	Male	55 Years	-	Farmer and fisherman	ES	Rp. 3.000.000
15	Asrani	Male	45 Years	2 person	Farmer	ES	Rp. 3.000.000

Figure 1: The Performance of Forest in Malilingin
Source: Malilingin Village Documentation, January, 2013.

Malilingin most villagers work as farmers, farming as a principal livelihood malilingin villagers. With agroforestry systems that have been implemented by Malilingin village, the village including the village developed economies compared to the villages located south Kalimantan. where the main crops grown there is *Hevea brasiliensis* and communities combine with other types such as *Oriza sativa, Musa paradisiaca, Capsicum frutescens, Arachis hypogaea*, which is where most of the plant is used as an interlude in the village needs while plant species *Hevea brasiliensis* alone sold as eye livelihoods. Selling points was the main crop is very high, in addition to the wood of *Hevea brasiliensis* species that has benefits for firewood because the quality is not too good rubber wood for construction purposes. The sap from the *Hevea brasiliensis* non timber plants also have a high selling price. *Hevea brasiliensis* plant sap can be taken on a regular basis after the age of 5-6 years. At the age of rubber tree (*Hevea brasiliensis*) under the age of 3 years are usually farmers plant rice (*Oriza sativa*) as intercrops. This system is often known as intercropping, the rubber tree sap earnings of approximately 15 kg per ha at a price of 10.000 per Kg it will earn 150,000 per day, if only weekdays effective for 20 days in a month will receive 3,000 .000 / month, with enough income as it is sufficient to finance the day-to-day needs. with agroforestry systems implemented in the village of malilingin can boost the economy and society can ensure the welfare of forest communities.

5 Conclusion

Agroforestry is a blend of agriculture and the development of environmental or forest conditions. With the agroforestry is expected to keep the forest in the form of agriculture in addition can also increase revenue community around forest.

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[PS25]

Farmer Motivation Planting Trees in Community Forest

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Abstract

How community forests develop in terms of area and potentiality and how the development itself will reduce the extent of degraded land and improve the welfare of local community are inseparable from the active role of community forest growers. There are reasons, intrinsic and extrinsic, that motivate members of local community to plant trees in community forests. Government agencies and relevant parties need to understand these reasons to enable them to foster interest of local community in planting trees. This study aims to reveal what motivates farmers to plant trees in a community forest in Kulon Progo.

Samples for the study were purposively taken from Keceme hamlet, Gerbosari village, Samigaluh sub district, Kulon Progo district. A questionnaire survey technique was used to collect data from 30 respondents who were randomly selected. Data was analyzed by descriptive qualitative and quantitative using scoring techniques.

It was revealed that what mainly motivates farmers to plant trees in community forest is to meet the needs of existence, to meet the needs for growth and to meet the needs for relatedness. Another reason that motivates farmers to plant trees instead of crops is growing awareness to conserve soil and water, increasing demand for wood products, government policies and infrastructure improvement. Planting trees in community forest is one of strategies that farmers choose to diversify their products and sources of income to meet their short, medium and long term needs.

Key words: motivation, community forest, agroforestry, survey, ERG theory

1 Introduction

Natural forests and plantation forests that the government manages have degraded. In contrast, community forests develop in terms of area and standing stock. Community forests have an important role in community livelihood. According to Awang (2002), well-managed natural resources in community forests will give benefits to farmers. However, failure to manage natural resources may

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lead to damage to natural ecosystems such as the extinction of fauna, bare soil, landslide and formation of savannah.

Community forests in Java have been developed as part of government programs to address critical land outside forested area. The program, which initially serves as a conservation effort through reforestation activities, has economic value e.g. firewood and raw materials for industries. The term community forest as stated in the Forest Act no 41/1999 is a private forest located in a private property. Forest Dictionary (1990) says that community forests are owned by the people or the land on which the forest exists is owned by indigenous people or customary continuously cultivated for forestry businesses are the type of timber, either naturally or planted.

Community forest that is developed by agroforestry techniques has a higher biodiversity than plantation forest. Social functions of community forest are also indisputable. Data from the Ministry of Forestry shows that the total area of community forest in Indonesia in 2009 was 3,589,434 hectares. Of the total area, 77.98% or 2,799.81 hectares are located in Java. While the wood potential for community forests in standing stock is 125,627,018 m³, the mature wood potential reaches 20,937,836 m³. This is very significant because the national timber production reaches 43,655,101 m³ (Forestry Ministry, 2009).

The development of community forest in Yogyakarta is quite rapid. An image from Landsat shows that the area of community forest in 2003 was 111,574.44 hectares. Based on a survey, there were 39,633,426 trees in community forests in 2006 with volume of 2,146,562.25 m³ (BPKH Region XI Java-Madura, 2006). Among 4 districts and 1 municipality in Yogyakarta, Kulon Progo district has the second largest community forest area after Gunungkidul. The community forest in Kulon Progo covers an area of 25,467.83 ha or 42.91% of the total area of the district. The potential number of trees in Kulon Progo community forest is 29,778,856 or 2,126 trees per hectare with volume of 675,310.31 or 48.23 m³/ha. The most dominant types of trees in Kulon Progo community forest are mahogany, teak, acacia, rosewood and albizia. Most of community forests in Kulon Progo are using agroforestry technique which combines trees and crops or plantation. Community forests in Kulon Progo can contribute to the livelihood of farmers. Community forest contributes 22% of farmers's total income (Nuroktalina, 2012).

The development of community forests in terms of total area and potentiality, which is able to reduce critical land area and improve the welfare of local people, is inseparable from the participation of farmers. Local community participates in development of community forests through tree planting. One of influencing factors to this activity is the motivation of the farmers. Motivation can be intrinsic and extrinsic. Intrinsic motivation comes from the activity itself, which gives farmers satisfaction because of doing the job and not because of other stimuli, such as social status or money. It is comparable to doing a hobby. Meanwhile, extrinsic motivation does not come from elements inherent in the work but from other factors such as gained social status or financial rewards. The Definition of motivation according to Handoko (1995) is individual's personal circumstances that drive individuals to perform certain activities in order to achieve the goal. Motivation can also be interpreted as factors that encourage people to act a certain way" (Manullang, 1982).

This study was conducted in order to reveal what motivates farmers to plant trees in community forest. Theory of motivation that will be used in this research is the theory of Clayton Alderfer called ERG motivation.

2 Motivation Theory

Motive is an inner state of the human that encourage, enable, drive, steer and channel behavior towards a goal (Koontz, 1990). The Clayton Alderfer's motivation theory is known by the acronym "ERG". This acronym stands for Existence (need for existence), Relatedness (need to connect with others) and Growth (growth needs). The Clayton Alderfer's motivation theory is an improvement to Maslow's theory of motivation. This theory is considered to be closer to reality of everyday life. Alderfer argues that the fulfillment of these three requirements can be performed simultaneously. It means that the relationship of these elements within ERG theory is not hierarchical. This is what distinguishes Maslow’s theory from ERG theory of motivation (Ivancevich and Matteson, 2002). The Alderfer's ERG motivation theory can be applied to precisely follow the personal needs of each individual.

According to Lathan (1998), Aldefer identifies the source of motivation which is is to fulfill three basic needs:

1. Existence needs including physiological needs such as hunger, thirst and shelter also requirements such as income and pleasant environment.
2. Relatedness needs is need that concerns on relationships with other people that are important such as family members, friends, neighbors and the community.
3. Growth Needs include the need to grow as a human and take advantage of its ability to reach their full potential

3 Method

The basic method of this research was a survey. Data was collected using questionnaires. Questions in the questionnaire are closed questions and choices of answers are based on 1-5 Likert scale where 5 = strongly agree, 4 = agree, 3 = doubtful, 2 = disagree and 1 = strongly disagree. Location in the study was purposively selected, and the criterion of selection was a relatively highly-developed community forest. The location of this study is Keceme hamlet, Gerbosari village, Samigaluh sub district, Kulon Progo district. Respondents were 30 families that were chosen randomly. Analysis of the data was using a mixed method which combines quantitative and qualitative methods to provide a more in-depth explanation. Scoring technique was used to determine the most dominant factors that motivate farmers to plant tree in community forest.

4 Result and Discussion

4.1 Community forest farmer characteristics

Out of 64 families residing Keceme hamlet, 30 households were randomly selected as the respondents in the study. While the range of the number of dependants in a household is between 2-7 people, the average number is 4 dependants for each household. This number displays human resource situation. In other words, it shows the availability of extra hands who can help with farming. Instead of bringing in workers from outside, family members can be involved in community forest management activities. On the other hand, the number of dependants also indicates the burden that those in the family who provide financial support have to bear.

The average age of community forest farmers and/or owners is 49 years old. This is an ideal age as they are not too old and have enough strength to do works in the community forests. The age range is between 32-69 years. As stipulated in Indonesian Law No. 13 of 2003, those belonging to the workforce are those who have entered the working age ranging from 15-64 years old. At this age group, people can be said to be in their productive age. Therefore, on average, community forest farmers in Kulon Progo are in their productive age. This condition is very potential for the development of community forests. Human Resource, in addition to physical, financial, and social assets is an important asset in the management of forests to improve livelihoods. Apart from age, other items that can be used to understand human resource assets are level of education, health status and skills.

Education level of farmers in Kulon Progo community forest can be seen in Figure 2. Most of community forest growers are elementary school graduates. Their level of education has implications in their level of knowledge and skills possessed. To improve human resource aspect in community forest management, there should be training sessions in technical cultivation in community forest.

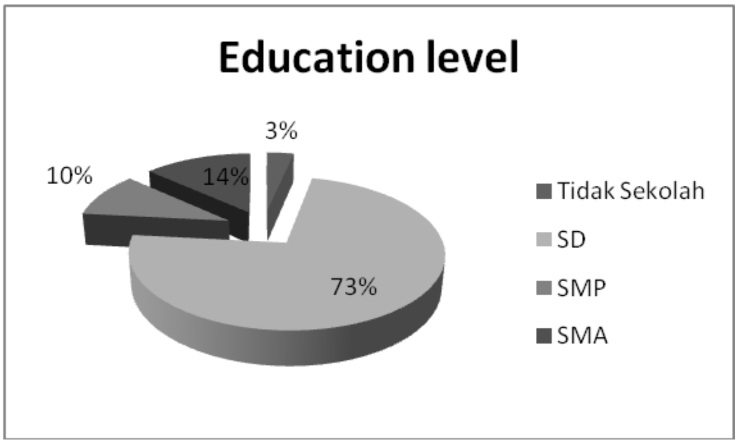

Figure 2: Community forest farmers in Kulon Progo by their level of education

It is common that community forest farmers in Keceme hamlet own more than one lots or area of land. While community forest farmers in Keceme hamlet own between 1-4 lots, on average, they have 3 lots. The distance from the lot to a farmer's house ranges from 0.1 - 7 km with average distance of 1.2 km. The average size of lot that farmers own is 0.8 ha from a range of 0.1 to 3.75 ha. As farming area is shrinking and population is growing, farmers prefer to plant subsistence crops, instead of trees. This, however, has changed in the last decades where farmers begin to plant trees in their land. Similarly, this also happens in Keceme hamlet. Gerbosari Village is situated in a hilly area, with 15-30% of slops. The type of farming land is categorized into dry fields and home garden, and later referred to as community forests. The most dominant spatial pattern in using community forest is a random combination of agricultural crops and forest trees called random mixture. The most common types of trees in the area are albizia, mahogany, teak, acacia, and rosewood. While main crops include maize, cassava and paddy, there are also cloves, coffee and tea. It is a local common practice that farmers grow herbs under trees.

4.2 What Motivates Farmers to Plant Trees

Community forest management focuses on households or the farmer’s family. Decisions are commonly at the hand of head of household or elderly person living in a household. Different farmers have different styles in making decisions. Different ways to produce a decision make community forest management varies from person to person (Awang 2007). These differences are also influenced by reasons why farmers develop a community forest. Reason or motive as previously stated means an inner state in a person that encourages, enables, drives, steers and channels behavior towards a goal (Koontz, 1990).

Based on ERG motivation theory, what motivates farmers to plant trees in community forest can be divided into 3 basic motives, namely existence, relatedness and growth. Table 1. shows the reasons why farmers plant trees in community forest based ERG motivation theory.

Table 1: What motivates farmers to plant trees in community forest

No	Motivation	Score	Percentage
1	*Existence*	25.6	37
2	*Relatedness*	20.3	29
3	*Growth*	23.3	34
	Total	**69.2**	**100**

Source. Primary data, 2012

As showed in table 1, the most dominant motive (37%) that drives farmers to plant trees in the community forest is *existence*, followed by *growth* (34%) and *relatedness* (29%). This suggests that farmers perceive community forest as an economic asset that can be used to meet their needs. For most farmers, community forest provides an economic function which is more valuable than ecological function or social function.

This motivation can be said to be identical to the first and second needs in Maslow's hierarchy, the physiological and safety needs e.g. hunger, thirst, shelter and also income and a pleasant environment. Tree planting in community forest by farmers is a way to meet the needs for food, clothing and house. Farmers also plant trees as savings for future needs. They see this as an activity to earn an additional income and to meet urgent needs. This is consistent with Rohadi (2012) who claims that the reason for farmers to plant trees in the community forest, among others, is provide a source of household savings and cash in an emergency. Farmer do not use forest product as a main income because the cycles of trees is long from 6-20 years.

Another reason for farmers to plant trees in community forest is to meet needs for growth. The needs for growth are similar to self-actualization according to Maslow's theory. Humans do things because they have a desire to express themselves and develop themselves. Planting trees in community forest is meant to gain additional knowledge, experience and skills in the field of forestry. Farmers also want to try a new commodity, wants to be a leader in the development of community forests.

The next reason for farmers to plant trees in community forest is to meet the needs for relatedness. The needs for relatedness are identical to the 3rd and 4th in Maslow's hierarchy of needs, namely social and awards. Humans will be in touch with others to meet social needs and get rewards from other people. Farmers plant trees in community forest to meet the needs for making connection with other people, to get along and maintain solidarity with their neighbors. This is consistent with the characteristics of the people in Kulon Progo and Java in general, that they value mutual cooperation and mutual respect among them.

Tree planting in community forest is not only a way to meet a farmer's needs but also a strategy to diversify products and sources of income. The tree is often used as a savings to cover sudden, unpredicted needs in large quantities. This is because tree planting offers several advantages, namely low initial investment and maintenance costs, quick increase in value compared to other assets, easy maintenance and plants are not easily damaged (Chamber, without year).

Awang (2001) suggests that decisions made by farmers to grow food crops are based on the consideration of the fulfillment of the needs of their family. Food crops trading decisions are based on climate suitability, capital support and expectations to make profit when crops are sold in the market. Thus what farmers have in mind is efficient use of land and diversification. The increased number of trees in community forest is an adaptation process that farmers do to cope with changes to resources, product demand and institutional factors. Culture is also a factor that contributes to the increase in the number of trees planted in community forest. Politics also affects the tree planting policy. Policies issued by the local government will have an effect on the outcome of tree planting activities. Market demand and government policies in trading activities will also affect the motivation of farmers to plant trees.

In addition to the underlying intrinsic motivation, farmers plant trees, instead of crops, because of several reasons. Frequent landslides and high level of erosion in Gerbosari village, or Kulon Progo in general, have alerted the public to the importance of minimizing erosion and improving soil fertility. One of the measures to take is to make terraced field or land and to plant more trees. Another extrinsic factor encouraging farmers to plant trees is an increasing demand for forest products. As the population expands, there is more demand for forest products such as fruit, fodder and firewood. Similarly, there is also an increase in demand for timber products for construction and furniture.

Government policies also affect the motivation of farmers to plant trees in the community forest. Among government policies that encourage farmers to plant trees are reforestation program and market policies or other policies relating to infrastructure. This is in accordance with what Fillius (1997) states that apart from internal factors which include changes in planting technology to increase productivity and changes in the availability of family members who can help in farming, good infrastructure will also encourage better marketing of products. As a result, farmers are encouraged to plant trees because it is easy for them to access the market. Road improvement and maintenance activities are very crucial to the development of sustainable agroforestry commercialization.

5 Conclusion

1. What mostly motivates farmers to plant trees in community forest is meeting the needs for existence, growth and relatedness. Community forest is an economic asset for farmers to meet urgent needs in large quantities in the future.
2. Other factors that motivate farmers to plant trees instead of crops is a growing awareness to conserve soil and water, an increasing demand for wood products, government policies and the infrastructure improvement.
3. Planting trees in community forest is a strategy that farmers take to diversify products and sources of income to meet their short, medium and long term needs

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[PS26]

Agroforestry: Prospect and Viability in Malaysia

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Abstract

Prospect of Agroforestry has been shown viable towards increasing land productivity of both agriculture and forestry on the same piece of land.. Being able to be implemented on idle and degraded forest, agroforestry will certainly avoid the need to use new land and thus relieving pressure on the natural forest.. In Malaysia, several agroforestry systems have been developed to maximize land use and improve resource base for the production of timber, non-timber and food from agriculture sector. Among the agroforestry systems that have been or to be developed on large scale in this country include direct interrow integration, block planting, perimeter planting and hedge system. Attempt at intercropping cash crops in young timber plantation has given additional income to the planters but only for 3-4 years before the timber canopy closed. Other systems have been well adopted in immature rubber, oil palm and fruit plantations. The planters have successful integrated with many crops including vegetables, bamboo, pineapple, maize, fruits and medicinal plants and animal rearing such as cattle, goat and chicken. The returns obtained are substantial and have offset establishment cost while providing income during the non-productive phase of the tree crops. In view of the attractive benefits of agroforestry, it has been formulated as one of the strategic action plan of the National Agriculture Policy. This paper reviews the prospect and viability of common agroforestry practices in Malaysia.

Keywords: Systems-Income-productivity-production

INTRODUCTION

The agroforestry approach is aimed at addressing ways to increase scarce domestic resources including land and raw material availability. In this approach, agriculture and forestry are viewed as mutually compatible and complementary, thereby providing scope for joint development and also aimed at creating a larger productive base for both sectors. The approach will:

- Allow for a wider range of agroforestry enterprise mix, optimise resource allocation, particularly land and enhance the income generating potential of agroforestry investments,

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- Allow the production of both agricultural and forestry products on the same land thereby mitigating the demand pressure for new arable land,
- Support various symbiotic relationships such as planting of forest species with industrial crops to optimise land utilisation and maximise returns,
- Provide avenues for early and continuous returns from the agriculture component of the mixed enterprise and encourage the participation of the private sector in commercial forest plantations, thereby increasing the supply of timber for the wood-based industries.

NEED TO IMPROVE RESOUCE BASE OF FOREST PRODUCTS AND FOOD

Issues on Natural Timber Resources

The natural forest in Malaysia is under pressure from the non-governmental organisations requiring that the forest need to be conserved for environmental purposes. In response to the global agreements including that of International Tropical Timber Organisation and the Rio Convention, the country has implemented several strategies amongst others which include sustainable forest management, enrichment of degraded forest and the reduction in the annual coupe.

These activities have directly or indirectly reduced the timber log supply in Peninsular Malaysia from 12.48 million m^3 to 7.98m^3 per year, a reduction of 4.45 million m^3 over the period from 1996-2000. The consequence of such change is the shortage of timber supply for the wood based industry. It has been estimated shortfall in demand will be in future supply.

Issues on Forest Plantation

Realising the declining timber resource from the natural forest and the need to sustain future supply of timber, forest plantations have been established as alternate source of wood supply. Compared to countries such New Zealand and Chile, the development of commercial forest plantation in Malaysia is relatively new.

Commercial forest plantation was first established in 1950's with the planting of teak followed by the planting of tropical pines in 1960's. In 1980's the widespread development of Compensatory Forest Plantation began in Peninsular Malaysia involving large track of damaged forest and idle land. This development extended into Sabah and Sarawak. By 1995 more than 77,000 ha forest plantations had been established in Peninsular Malaysia, 89,000 ha in Sabah and 12000 ha in Sarawak.

Being new, the development of forest plantations in Malaysia is constrained by many factors and the pertinent ones are land, finance and labour. It is an established fact that for an economically viable forest plantation it requires large tract of land. If the objective is to produce timber for sawmilling and furniture manufacturing an area of 15,000 ha to 20,000 ha is needed. In the case where chips or pulp is the main product, the economic sized plantations must be 60,000 ha to 150,000 ha. It is desirable that the land is available in single contiguous piece if not in two or three nearby parcels. This is to ensure easy and efficient management of the forest plantation. Such contiguous land area is limited particularly in Peninsular Malaysia. Besides sufficient land size, the location with suitable infrastructure and premium rate are also crucial factors.

Labour has been identified as a constraint in the development of forest plantation. In Malaysia, because of the continuous migration of youth from rural to urban sector the plantations are experiencing labour shortage. To resolve this issue foreign labour are being employed and this situation is not consistent due to the changing government policies both locally and overseas in labour requirement.

Among the financial factors effecting the successful establishment of forest plantation are high initial capital, long gestation period and high economic risk. The unproductive phase of the forest plantation ranges from 7 years in the case of pulp, fiber or woodchips estate to more than 15 years in plantation for sawntimber production. As measures to reduce the financial burden and thereby attract private sector to invest in forest plantation the government introduce several incentives. These incentives which include Pioneer Status and Investment Tax Allowance of late have shown to be inadequate. The situation is made worst with the increased land leasing cost.

SUMMARY OF CASE STUDIES

From research and case studies on agroforestry, the conclusions that can be derived are as follows;

- Studies on intercropping of short term crops with tree plantation are adequate and enough to be developed nationwide not only under rubber but in between other tree crops including oil palm, coconut and cultivated timber trees.
- Animal rearing that is well studied under tree crop include sheep rearing and poultry and these are being adopted by planters as a means of increasing income of their holdings. Other animals that show promise are nyatoh, deer and cattle but these are not being extensively studied under tree plantation.
- Other farming activities in tree plantation such as quail rearing, mushroom cultivation and bee rearing have been shown technically and economically viable. However the adoption is very low.
- Research on integration of timber and non-timber species with agricultural crops is relatively new and limited. A lot more work is required before it can be recommended over a large area. Ongoing research has to be continued and expanded to increase confidence for promotion and development.

Potential Areas for Agroforestry Projects

Areas to practice agroforestry in Peninsular Malaysai are plentiful. Since it can be developed in existing agricultural land, forest plantation and idle land there is no necessity to open new land from natural forest. Combining the statistical report from department of agriculture (Statistic Dept,1999) and a study report on ' Baseline Information On Land In Malaysia For Conversion Into Forest Plantation' (FRIM & FDPM, 1995) the area that can be used for agroforestry in Peninsular Malaysia are shown in table 14. The results are summarised as follows;

- Under existing and future forest plantation a around 440,000 ha can be used for integration with animals such as deer, nyatoh and kancil or interrow planting with herbal/medicinal plants such as tongkat ali. New areas to be developed may be mixed planted with fruit trees.
- In oil palm and rubber plantation, land area estimated at 3.47 million ha can be utilized for mixed farming with animal rearing and intercropping while the available vacant spaces (such as steep slope and steep terrain) as well as along road/river perimeters can be filled with timber species.
- In other agriculture areas including coconut, cocoa and tobacco, land area estimated at 148,000ha, their perimeters/boundries are potential for the planting of timber species.

CONCLUSION

Natural forests are no longer sustainable in supplying raw materials for wood based industry in Malaysia. Realizing this, Malaysian government under the Ministry of Plantation Industry and Commodity has promoted Heavea brasiliensis as one of the timber tree species to be planted on a commercial scale and potentially to integrated with cash or agriculture crop based on current research and findings. Agroforestry is considered a suitable solution to help the farmers to get early income, Agrisilviculture, an agroforestry demonstration plots was established to determine the efficiency of the combinations between forest tree species and cash crop. The income from cash crop is expected one year after planting. For successful integrations, consideration must be given to the selection of adaptable species, production and maturity cycle and type of management systems to be adopted. Considering the case studies and the constraints of agroforestry, the recommendations have been identified for successful development of agroforestry in the country. The implementation of the recommended agroforestry approach is in line with the National Agriculture Policy. In this policy, the agroforestry approach is aimed at addressing ways to increase scarce domestic resources including land and raw material availability.

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List of presentation only abstract

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Brett J. Butler et al. [PL2-3]

Effects of gender and length of land tenure on non-industrial private timber supply in Finland
Heimo Karppinen et al. [PL3-1]

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