

# *Final Report*

## IUFRO INTERNATIONAL AND MULTI-DISCIPLINARY SCIENTIFIC CONFERENCE Forest-Related Policy and Governance: Analysis in the Environmental Social Sciences



**Bogor, October 4 – 7, 2016**

**Hosted by**



**Bogor Agricultural  
University**  
<http://ipb.ac.id>



GEORG-AUGUST-UNIVERSITÄT  
GÖTTINGEN



**Research, Development  
and Innovation Agency**  
Ministry of Environment and Forestry  
Republic of Indonesia

**Co-hosted by:**



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# Background 5

Forests play an important role in human life. Forest contributions can further be categorized into environmental, social, and economic benefits. Examples of environmental benefits include providing a habitat for a variety of flora and fauna as well as providing environmental services, such as hydrological function and micro-climate regulation. In terms of their social contributions, forest play an important role in poverty reduction and providing livelihood sources for forest communities. Last forests contribute economically through a variety of timber and non-timber resources.

The economic potential of the forestry sector will have a major impact on increasing demand for forest use and management. In Indonesia, forestry-based sectors have the second largest forward linkages among other Indonesian economic sectors. A forward linkage is created when investment in a particular sector encourages investment in subsequent stages of production. In addition, it also holds considerable economic multiplier impacts for the national output, income, and employment. While the Indonesian forestry sector holds great promise, excessive environmental impacts can decrease other forms of forest contributions. Therefore, sustainable forest management is necessary to obtain all the forest benefits, whether environmental, social, or economic.

Sustainable forest management has many dimensions. Some hold that sustainable forest management necessitates discussing silvicultural systems and ecological as well as socio-cultural benefits. Policy, which dictates and guides management and benefit distribution, is also essential to sustainable forest management. To pursue effective sustainable forest management, researchers must combine technical management aspects with strong political will in addition to adequate regulative instruments.

In his first term, President Joko Widodo established the Ministry of Environment and Forestry (MoEF). The MoEF was expected to formulate and determine policies for the implementation and consolidation of forests that include: conservation management of natural resources and ecosystems; increase the carrying capacity of watersheds and forest conservation; improve the competitiveness of the industry primary forest products and the quality of environment, pollution control, and environmental damage; mitigate the impacts of climate change, land-use, and forest fires; generate social forestry and

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environmental partnerships; and decrease the interference, threats, and violations of environmental laws and forestry.

The increased attention to Indonesian forestry and environmental issues supports the IUFRO International and Multi-disciplinary Scientific Conference. This conference was hosted by the Directorate of Strategic Studies and Agriculture Policy (KSKP - IPB), the Chair of Forest Policy and Nature Conservation University of Goettingen – Germany, and it was co-hosted by The Forest Policy Division of the International Union of Forest Research Organization (IUFRO) as well as by PERSAKI (The Indonesian Forestry Scholar Association).

## *Objectives*

The IUFRO International and Multi-disciplinary Scientific Conference objectives are:

1. Understanding case studies as well as learning about forest policy and environmental governance at national and international levels.
2. Identifying opportunities and challenges in the forestry sector policy formulation and environmental governance regulation.
3. Providing recommendations on forestry and the environment sectors, especially for policy and governance.
4. Developing cooperation between IPB and national as well as international stakeholders.

## *Outcomes*

Expected outcomes are:

1. Increased understanding and capacity of forest policy and environmental governance through case studies at national and international levels.
2. Identification of the opportunities and challenges in formulating forest policies and environmental governance.

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3. Recommendations for the forest and environment sectors, which can be delivered to national and international stakeholders.
4. Cooperation in the establishing connections between IPB and national as well as international stakeholders.
5. Dissemination of academic writing in the form of conference proceedings and scientific journal publications, in both national and international journals (Scopus indexed).

## *Time and Venues*

This Conference was held for four days, from October 4-7, 2016 at the IPB International Conference Center, as well as in several places around Bogor and Jakarta (for the activities of the In-Conference Excursion).

## *Participants and Exhibitors*

This Conference was attended by more than 400 researchers, students and environmentalists from 23 countries. There were 30 scientific sessions dedicated to trans-disciplinary questions at the science-policy interfacing and includes contributions from various disciplines on this issue as well. Those session consists of 107 oral presenters and 46 poster presenters. Beside the oral and poster participants, the conference was also have exhibitors from hosts, co-hosts, sponsors and partners. The exhibition documentation are listed in the Appendix 2.

## *Activities*

### **Day 1 – Tuesday, October 4 2016**

The conference was opened by traditional performance from students of Bogor Agricultural University (IPB) which named as “*Gentra Kaheman*”. *Gentra Kaheman* are students activity units which – cited from their official website – engaged in various

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activities in art and culture, especially Sundanese. They performed several number of dances to introduce Indonesia culture in general and Sundanese in particular. In the opening ceremony, there was several speeches that given by Chairman of OC (Dr. Dodik Nurrochmat), Board of IUFRO/Conference Scientific Committee (Dr. Lukas Giessen) and . Rector of Bogor Agricultural University (Prof. Herry Suhardiyanto). In his speech, Prof. Herry Suhardiyanto emphasizing on improving the quality of research, and developing scientific collaboration as well as networking in this very conference.



Fig 2. Speeches from Rector of Rector of Bogor Agricultural University (left) and Minister of Environment and Forestry, The Republic of Indonesia (right)

The conference was officially opened by the **Minister of Environment and Forestry**, The Republic of Indonesia, **Dr. Siti Nurbaya Bakar**. She also give some point on her speech, especially the importance of science in developing public policy as well as ministry policy. By working together, scientist and government can develop the technical and management aspects on sustainable forest management.



Fig 2. Minister of Environment and Forestry, The Republic of Indonesia visiting one of the exhibitor booth at the conference

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After opening ceremony, the Minister was pleased to give press conference, which was attended by journalists from Indonesian media; i.e. Kompas, TVOne, MetroTV, ANTARA, KOMPAS, Republika, Media Indonesia, Radar Bogor, Jurnal Bogor, GreenTV, Humas IPB, TROPIS, TEMPO, RRI, TVRI, Indosiar, Liputan6, MNC Media, MGS, etc.



Fig 3. Press Conference

We have the honor to have **Prof. Dr. Max Krott** from the University of Goettingen, Germany to give his keynote speech on “*Professional Policy Support by the RIU Model*”. To conclude his speech, Prof. Krott emphasizes on the need for excellent national science, need for professional integration, clearing house in innovation as well as responsible political decision.



Fig 4. First plenary session

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Fig 5. Conference's participants

After break, first plenary session was conducted with speakers include experts i.e: 1.) DG of Environment and Forestry Research, Development and Innovation Agency - MoEF (Dr. Henry Bastaman), 2.) Director of Strategic Studies and Agriculture Policy - Bogor Agricultural University (Dr. Dodik Nurrochmat) and 3.) Group Head of the Chair of Forest Policy and Nature Conservation University of Goettingen Germany (Dr. Lukas Giessen). Second plenary session was conducted right after, with speakers i.e: 1.) Prof. Bas Arts - University of Wageningen the Netherlands, 2.) Prof. Runsheng Yin - Michigan State University USA, 3.) Prof. Liu Jinlong - Renmin University of China, Beijing, China, and 4.) Dr. Maria Brockhaus - CIFOR, Indonesia. The speakers presented materials on forest policy and environmental governance. The first day of the conference was closed with satisfied and warm gala dinner with the presentation of “interactive *angklung*” performance from Saung Udjo.



Fig 6. Participants get warm and cozy with interactive *angklung*

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**Day 2: Wednesday, October 5, 2016**

On the second day, all the participants were presented their papers in technical sessions. The technical sessions was held in the ballrooms and also in seminar rooms. Participants were divided into 30 session wich contained oral and poster presentation. Posters were displayed at panels in the ball room where the participants were able to accessed them during the conference. The technical session was succeeded by invited under- and post-graduate students of IPB to give them the experience of joining the international conference and the chance to make networking.

This is the general info on the technical sessions:

**Themes:****FOREST AND ENVIRONMENT GOVERNANCE****Sub-themes:**

Session 1.1. The global-nexus in forest governance

Session 1.2. Forest governance: Improving forest sustainability in countries in transition?

Session 1.4. Brokering knowledge, mediating interests: The impact of institutions at the forest science-policy interface across the globe

Session 1.6. Illegal logging policies across the Globe: developments and prospects

Session 1.7. Decentralization and forest governance transformation

**Themes:****FOREST ECONOMY AND ENVIRONMENT POLICY****Sub-themes:**

Session 2.1. Forest in transition: challenges for sustainable development

Session 2.2. Wildland fires and ecosystem services: effects and economic valuation

Session 2.4. Bridging social-economy and ecological interests in conservation area management

Session 2.6. The societal dimension of the forest based bioeconomy – participation, sustainability and justice in natural resource governance

**Themes:****CO-MANAGEMENT, FOREST PRODUCTS AND SMALLHOLDERS****Sub-themes:**

Session 3.1. Empirical and theoretical insights from community-based policy approaches

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Session 3.2. International forest governance and its domestic influences

Session 3.3. Social and institutional approaches to study forest management and livelihoods

Session 3.5. Intensive wood production and its potential for benefiting non-wood values in extensive forests.

Session 3.6. Sustainable community forest and wood production

**Themes:**

**MULTISTAKEHOLDERS COLLABORATION IN FORESTY AND ENVIRONMENT MANAGEMENT**

**Sub-themes:**

Session 4.1. Multistakeholders' cooperation in forestry research

Session 4.2. Public-private partnership in forest management

Session 4.3. ASEAN cooperation in forestry researches

Session 4.4. Livelihoods and socio-economic factors influencing sustainable forest management

Session 4.5. Challenges and opportunities of forestry scholars in a changing forest environment

Session 4.6. Exploring the interface between local people and industrial plantations in South- East Asia.

**Themes:**

**FOREST LAND USE, ASSESSMENTS AND CERTIFICATION SCHEMES**

**Sub-themes:**

Session 5.1. REDD+ performance assessments

Session 5.2. Identifying priorities for impact-oriented forest policy research in tropical countries

Session 5.3. Contestation of different forest and plantation certification schemes

Session 5.4. Sustainable forest management governance standards: economic and policy

Session 5.5. Assessing conformity of forest management practices and conservation policy

Session 5.7. Integration of land base sectors' policy for sustainable development

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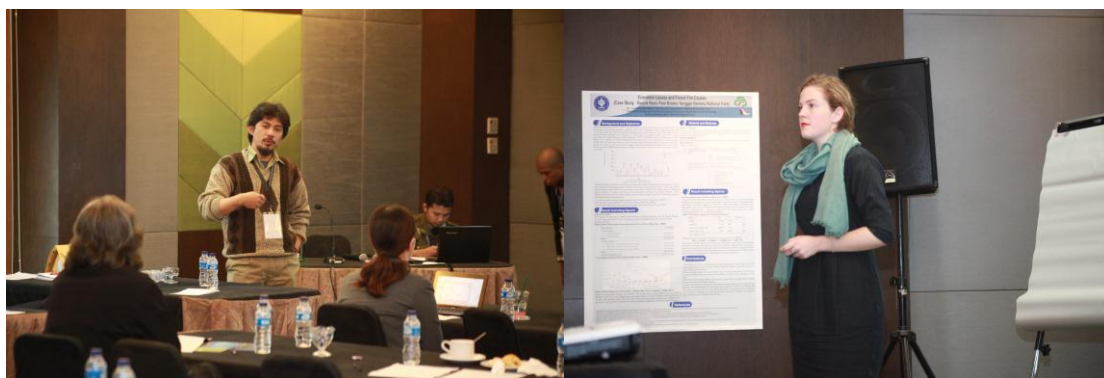


Fig 7. Oral presenter (left) and poster presenter (right) in technical session presentation

#### List of Presenters

Session	Name	Title
1.1	Gamma Galudra	Shifted discourse, shifting power: how climate change mitigation and justice are negotiated in Indonesia
1.1	Monica Di Gregorio	Multi-level Governance of Climate Change in Forests and Agriculture in Indonesia
1.1	Marija Isailovic	Legitimation in Networked Governance Arrangements: The Case of Global Forest Governance
1.2	Kuniawati Purwaka Putri	Strategic Analysis of <i>Shorea</i> Spp Seed Sources Management at Haurbentes Forest Areas for Special Purposes
1.2	Kristina Van Dexter	Multilevel governance on the forest-agriculture interface
1.2	Agkillah Maniam	Cost of a Path Change: Conservation Policy-Standoff in Malaysia's Central Forest Spine
1.4	Susanne Koch	Integrating science into environmental policymaking: insights from South Africa
1.4	Budi Dharmawan	Failure of Knowledge Transfer in Upper Area: Case in Improving Electric Hydropower Plant, Indonesia
1.4	Wenyuang Liang	Off-farm Jobs and Reforestation: Evidence from China
1.4	Agustinus Kastanya	Multi Landscape Forest Management of Small Islands In The Moluccas Based On Green Economy
1.6	Yurike	The Level of Encroachment in Forest Management Unit Dharmasraya District, West Sumatra, Indonesia
1.6	Yeon-su Kim	Forests for Carbon, Water, Food, Energy and Livelihood: Trade-off and synergies
1.6	Ram Pandit	Factors influencing adoption of REDD+ in community forests
1.6	Desmiwati	Is Social Forestry Program Solution for Reducing Forest Degradation? (Case Study on Tesso Nilo Community)
1.6	Marija Isailovic	Farmers movement in efforts to reclaim the land from big logging companies in the case of Mount

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Session	Name	Title
		Ungaran and Mount Kendang, Central Java
1.7	Bijendra Basnyat	Interests of Forest Bureaucrats in Community Forest Management Plan Revision in the Western Hills of Nepal
1.7	Irina Mancheva	The Drivers of Collaboration at the Local Level: What is needed for individual private forest owners to start collaborating in a context of high trust and soft regulation?
1.7	Asti Istiqomah	Designing Stakeholders Cooperation Based on Payment For Ecosystem Services for Natural Tourism in Halimun Salak National Park, Indonesia
1.7	Marija Isailovic	Legitimacy and Authority: Enactments of the Nature in the Western Ghats Region in India
1.7	Hari Kaskoyo	Recentralizing in Indonesia's forestry sector: Is province government ready to manage the forest? Case studies in Lampung Province, Indonesia
2.1	Arzyana Sunkar	The Potential Role of Independent Smallholder Oil Palm Farmers in Biodiversity Conservation is Undervalued
2.1	Christine Wulandari	Impacts of Laws No. 23/2014 to Development of Community Base Forest Management in Lampung Province, Indonesia
2.1	Srijana Baral Jamarkattel	Politics of Getting the Numbers Right: Forest Inventory in Community Forestry of Nepal
2.1	Meti Ekayani	Ecotourism as Payment for Ecosystem Services to address Socio-Economic and Ecological Issues in Halimun Salak National Park, Indonesia
2.1	Dodik R. Nurrochmat	Making Green Development Work: Formulating Strategies for Low Carbon Development Mechanism in Land Use Sector
2.1	Retno Maryani	Institutional stability for sustaining forest management in Indonesia
2.1	Matt Leggett	Evaluating Trade-Offs in the Agricultural Sector
2.1	Reonaldus	Change and stability of advocacy coalitions in preparing and extending the Forest Moratorium of Indonesia
2.1	Tigor Butarbutar	Forest and Environment Governance Based On Hydronomic Zone: Authority Board For Toba and Asahan Watershed, North Sumatera, Indonesia
2.2	Armando Gonzalez-Caban	Relevance of Ecosystem Services Values in Wildland Fire Management
2.2	Laura Porter-Jacobs	Meanings and implications of media discourse concerning transboundary haze in Indonesia
2.2	Herry Purnomo	Reducing Forest and Land Fires through Good Palm Oil Value Chain Governance
2.2	Yeon-su Kim	Wildfires and Ecosystem Services in Native American Forests
2.2	Tuoyuan Xu	Resource management and forest quality: evidence from the reform of collective forest right system
2.2	Bahroin Idris Tampubolon	Economics Losses and Forest Fire's Causes (Case Study: Ranu Pani Resort, Bromo Tengger Semeru National Park Indonesia)
2.4	Meti Ekayani	Economic Impact of Natural Tourism: Driving

Session	Name	Title
		Community's Participation for Conservation in Halimun Salak National Park, Indonesia.
2.4	Moh. Yusram Massijaya	Safeguarding national park through community forests and nature conservation policy reform in Lombok Island, West Nusa Tenggara, Indonesia
2.4	Stephen David Elliot	Where Science Meets Communities: Developing Forest Restoration Approaches for Northern Thailand
2.4	Didik Suharjito	The Effectiveness of Local Institution in Managing Private and Common Forests in Indonesia
2.4	Deni	Alternative Livelihood Dillema and Degradation Park: Contested of Power to Struggle Social-Economy- Ecological Interest in Gede Pangrango National Park
2.4	Mimi Salminah	Macadamia Dominated Forest Cover Increases Instream Sediment and Soluble Phosphorus in the Lower Wilsons River Catchment, Subtropical Australia
2.6	Alexandru Giurca	How does the German forest sector perceive bioeconomy? Implications for forest policymaking
2.6	Irmeli Mustalahti	Responsive Bioeconomy: Learning from interaction of states, citizens and forestry sector in forest based bioeconomy
2.6	Asihing Kustanti	Property Right Evolution on Mangrove Management with No Land Emerged in Pesawaran Regency Lampung Province—A Case from Indonesia
2.6	Tiina Maria Paloniitty	Public participation and adaptive management in wetlands governance
3.1	Constantin Nicolai Harrer	By whose rules, for whose needs? Power of elites, livelihood implications and resistance in Nepalese community forest user groups
3.1	Yumi Sakata	Legalization and local management of customary forests in Jambi, Indonesia
3.1	Ahmad D Dermawan	Implications for formalizing small-scale timber operators for employment and revenues: Lessons from Indonesia
3.1	Krisdianto Sugiyanto	Analysis of Value Adding on Bamboo Products in Kintamani Sub-District, Bali: A Study Case in Hidup Rukun Farmer Group
3.1	Bijendra Basnyat	Interests of Forest Bureaucrats in Community Forest Management Plan Revision in the Western Hills of Nepal
3.1	Boby Muslimin	Promoting Non Timber Forest Product to Alleviate Poverty in Kerinci Seblat National Park Buffer Zone South Sumatera: A Reflection on Market and Policy Challenges
3.1	Heru Setiawan	Mangrove Contributions in Supporting the Development of Small Island; A Case of Tanakeke Island, Takalar, South Sulawesi
3.1	Husnul Khotimah	Bamboo Industrial Plantation Forest : Challenges and Opportunities for Indonesia
3.1	Ina Winarni	Cellulosic Ethanol Development as Bioenergy Policy in Indonesia :Technology and Cost Production Feasibility



Session	Name	Title
3.2	Muhammad Alif K Sahide	Downstream areas as an entry point for International watershed regimes in Indonesia
3.2	Stephanie Bethmann	Where the action is. Exploring the public's dynamic relationship to forestry in Germany.
3.2	Yvonne Kunz	Landscape transformation in Jambi province Sumatra – An analysis of land tenure regulations under translational dynamics
3.2	Jiayun Dong	Creating both conflicts and solutions between customary and legislative regulation – case of China
3.3	Syukur Umar	Structural Analysis for Farmer's Post Adoption Decision on The Farm Forestry Policy Based Candlenut Agroforestry of Central Sulawesi, Indonesia
3.3	Suyanto	Can securing land tenure improve livelihood and ecosystems services: case study of community forestry based in Indonesia
3.3	James Thomas Erbaugh	Assessing, analyzing, and visualizing content change in Indonesian forest policy, 2000 to 2015
3.3	Messalina L. Salampessy	Principal Agent in Tree Mortgage System on Traditional Agroforestry Management in Moluccas Indonesia
3.3	Dyah Ita Mardiyarningsih	The end of the last hunter-gatherers in Kalimantan: analysis of changes in forest areas and the transformation of livelihoods system
3.3	Arga Pandiwijaya	Participatory Village Land Use Planning (PLUP) in Papua, Indonesia: Challenges and Opportunities
3.3	Bugi Kabul Sumirat	The urgency of increasing private forest farmers' capacity building towards the increase of their livelihood: Lessons from Indonesia
3.3	Fitta Setiajiati	Design of Forest Community Empowerment in Forest Management Unit (FMU) of Batulanteh
3.3	Agustinus Kastanya	Analysis of Cultural Landscape in Forest Management by Indigenous People of Sahu Indigenous People in West Halmahera Regency
3.3	Desy Ekawati	Bamboo Rangers: A Model of Participatory on Community Bamboo Forestry Management
3.5	Romain Pirard	Do tree plantations support natural forest conservation?
3.5	Russell Warman	The plantation conservation benefit: An Australian case study
3.5	Iis Alviya	Developing Community-Based Forest Ecosystem Service Management to Reduce Emissions from Deforestation and Forest Degradation
3.5	Andianto	Wood Identification of Medicinal Plant Species, A Review
3.5	Dian Anggraini Indrawan	Fiberboard As Raw Material Substitute For Wooden Handicraft Products
3.5	Novitri Hastuti	Carbon Footprint Analysis on Pine Activated Charcoal Manufacturing (On Laboratory Scale)
3.6	Dwiko Budi Permadi	Which smallholders are willing to grow fast wood in the partnership schemes? Evidence from choice experiment study
3.6	Herryadi Adun	Responsible international market, and the

Session	Name	Title
		certification of wood industry and community forest in Java - Indonesia
3.6	Hardjanto Wiriyosaroyo	Integration of Community Wood's Production and Process as a Solution to the Development of Community Forest Business
3.6	Russell Warman	When wood production comes out of the woods: The resilience and transformability of forestry
3.6	Wen Luo	Consumers' willingness-to- pay for modern wooden structure buildings: compare between China and Japan
4.1	Herman Hidayat	Stakeholder's Movement on Forest Resource Management: A Study in Merangin District-Jambi Province
4.1	Qori Pebrial Ilham	Model of Multistakeholders Forest Management: A System Study of the Protected Forest Management Unit in Solok, Indonesia
4.1	James Reed	A rose by any other name? Evaluating landscape approaches in the tropics
4.1	Nurul Qomar	Stakeholder Analysis in The Implementation of Giak Siam Kecil-Bukit Batu Biosphere Reserve Concept, in Riau, Indonesia
4.1	Nur Silva Lestari	Modelling the distribution of Shorea leprosula in Kalimantan, Indonesia: a tool for conservation planning
4.1	Catur Budi Wiati	Stakeholder Mapping in Conflict Resolution Efforts in KHDTK Labanan, District of Berau
4.1	Asri Joni	Identifying Land-Forestry Policy Levers from Participatory Understanding of Drivers of Forest Conversion: Case Study from Three Provinces of Indonesia
4.2	Subekti Rahayu	Public –private partnership in forest restoration of Samboja Research Forest
4.2	Achmad Rizal	The Environment and Forestry Research and Development Institute of Makassar, Ministry of Environment and Forestry of Indonesia
4.2	Marija Isailovic	Discursive Fragmentation in Global Forest Governance: Myth or Reality?
4.2	Arief Amir Rabik	A Thousand Bamboo Villages; As An Enabler for A Community Based Bamboo Industry In Indonesia.
4.3	Agung Wibowo	Overlapping of Forest Certification Regime in ASEAN: Analysing conflict between Private, State and Regional Governance
4.3	Mi-sun Park	Bilateral international forest cooperation under the international forest governance: learning from the Republic of Korea case
4.3	Hyowon Lee	Bilateral international forest cooperation under the international forest governance: learning from the Republic of Korea case
4.3	Leti Sundawati	Assessing Carbon Sequestration from Various Land Uses and Community Readiness on Climate Change Mitigation in Rural Area of Indonesia
4.3	Herry Purnomo	Landscape Transformation, Fire Patronage Network and Sustainable Development

Session	Name	Title
4.4	Yanto Rochmayanto	Property Rights of Forest on National Legal Framework : a Content Analysis in Indonesian Statutory Laws
4.4	Dwiyana Hendrawati	The Performance of Social Aspects in the Collaborative Forest Management in Indonesia
4.4	Tri Sulistyawati Widianingsih	Gender Role Distribution In Land Management Around The Rinjani Barat Protected Forest, Nusa Tenggara Barat
4.4	Eva Achmad	Transformation of Consumption Pattern of Orang Rimba At Bukit Dua Belas National Park In Jambi Province
4.4	Mei Meilani	Finding Alternatives of Livelihood Sources for Forest Dependent Communities in Protected Areas: A case study of Sebangau National Park, Central Kalimantan Province, Indonesia
4.4	Eva Fauziyah	Construction Of Local Wisdom The Private Forest Farmers On The Utilization Of Duwet ( <i>Syzygium cumini</i> Linn)
4.4	Nathan Morrow	Rooting the future; planting trees as a pathway to increased property values, wellbeing and resilience of rural Ethiopian households; evidence from a 20-year panel study.
4.4	Eva Fauziyah	Gender Relation Pattern on Private Forest Management at Banyumas and Banjarnegara District
4.4	Thais Gabrielle Zamboni Córdova	Changes in livelihood of smallholders groups certified with FSC SLIMF
4.4	Dhany Yuniati	Socio-Economic Factors Of Woven Bamboo Enterprises and Bamboo Farmers In Utilizing Bamboo As Determinant Of Sustainable Bamboo Forest Management In Bangli District, Bali
4.5	Jun Harbi	Strategy to Improve Livelihood for Biodiversity Conservation in Forest Management Unit
4.5	Silvi Nur Oktalina	The Effect of Farmer Motivation to Community Forest Intensity
4.5	Peter Edwards	Empowering forest scholars to empower communities: A case study from the East Coast of New Zealand
4.5	Efi Yuliati Yovi	Supporting Implementation of Sustainable Forest Management in Indonesia: An Ergonomics Approach
4.5	Takahiro Fujiwara	Transdisciplinary Approach in Controversial Forestry Issues: Challenges for Multistakeholders' Collaboration toward Sustainable Forest Management
4.5	Margaretta Christita	Forester as agent of change and initiator on volunteering system toward environmental education and conservation of endangered species
4.6	Romain Pirard	Do tree plantations support natural forest conservation?
4.6	Ahmad Dhiaulhaq	Creating synergies among stakeholders to support private forest: Lessons from Indonesia
4.6	Kristiana Tri Wahyudiyati	Corporate Social Responsibility and timber plantation development in Indonesia

Session	Name	Title
4.6	Anne Toppinen	Effects of industrial plantations on ecosystem services and livelihoods: perspectives of rural communities in China
4.6	Arttu Malkamäki	Socioeconomic impacts of large-scale tree plantations on local communities. Examining the empirical evidence.
5.1	Grace Wong	Assessing how results-based payment approach can incentivize effective, efficient and equitable REDD+ outcomes
5.1	Chyntia Dewi Maharani	REDD+ Performance Enabling Conditions and Stumbling Blocks: Qualitative Comparative Analysis; Experiences of 15 Countries
5.1	Rodd Myers	Multilevel governance challenges of altering land use change trajectories: technical solutions to political problems in REDD+ and non-REDD+ land use changes
5.1	Efrian Muharrom	The Process of REDD+ policy making in Indonesia: REDD+ as Transformational Change or a Media for Change
5.1	Rudi Subarudi	Policies Influencing the Performance of REDD+ in Indonesia
5.1	Subekti Rahayu	Developing community-based carbon and biodiversity monitoring in Papua
5.1	Marthina Tjoa	Strengthening the Right and Access Tenure of Forest Land of Indigenous Communities in The Seram Western District of Maluku
5.2	Bimbika Sijapati Basnett	Gender, migration and forest governance: Rethinking community forestry policies in Nepal
5.2	Phyu Phyu Lwin	Land-use change, its underlying causes and impact on mountainous forests in eastern Myanmar
5.2	Suvarna Chandrappagari	Addressing equity concerns in forested watershed catchment treatment projects in Telangana, India
5.2	Desmiwati	Levelling Up the Forest Collaborative Management in Indonesia
5.2	Arie Budiyanto	Assessing The Effectiveness of Community-Based Mangrove Management: Study Case in Jangkaran Village, Kulon Progo Regency, Indonesia
5.2	Marija Isailovic	Transformative Power of Alternative Discourses in Forest Governance: The Role of Adat in Indonesia
5.3	Eva Fauziyah	Mapping of Stakeholders In The Private Owned Forest Management
5.3	Agung Wibowo	From voluntary private to mandatory state governance in Indonesian forest certification: Reclaiming authority by bureaucracies
5.3	Hayu Wibawa	Cooperation Model for Sustainable Forest Management Certification Implementation in Indonesia
5.3	Herry Purnomo	Timber Legality, Certification and Brexit
5.4	Timothy Cadman	Governance values in the climate change regime: stakeholder perceptions of REDD+ legitimacy at the national level
5.4	Alan Purbawiyatna	Improving Community Forest Governance Through Implementation of Community-based Forest Management Standard and Timber Legality

Session	Name	Title
		Assurance System in Indonesia
5.4	Arya Hadi Dharmawan	Livelihood System of Smallholding Forest Farmers and The Dilemma of Timber Certification
5.4	Sudarsono Soedomo	
5.5	Vilis Brukas	Protecting or destructing? Forest management versus nature conservation in Lithuanian forestry
5.5	Chandra Irawadi Wijaya/Syafrul Yunardy	Participatory Forest Landscape Restoration Planning in South Sumatra
5.5	Nayu Nuringdati Widianingsih	Land Use Type, Species Preference, and Ethnicity in the Vicinity of Restoration Area, Hutan Harapan - Indonesia
5.5	Yanto Santosa	The Urgency of Forest Area Allocation in Spatial Planning for Mammal and Bird Conservation
5.5	Megha Nath	Mapping Evidence on Forest Conservation
5.7	Dodik Ridho Nurrochmat	The landswap policy of oil palm plantations and its chance to reduce deforestation in Central Kalimantan, Indonesia
5.7	Siti Nurjannah	The Role of A High Conservation Value Area in Palm Oil Plantations in Riau Province
5.7	Bedjo Santoso	Land use policy: forest and oil palms
5.7	Chairil Anwar Siregar	Discussing oil palms: ecological and policy approach

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**Day 3: Thursday, October 6, 2016**

The main activities in the third day of the conference were in-conference excursion. The excursion destinations in the Bogor area included the Bogor Presidential Palace, Balai “Kirti”, Bogor Botanical Gardens, and IPB campus tour (Andi Hakim Nasoetion Building, Forestry Innovation Centre and Agribusiness Development Station). The destinations in the Jakarta are included The National Monument and Taman Mini Indonesia Indah (TMII).



Fig 8. Participants in the front of Bogor Presidential Palace



Fig 9. Participants in *Taman Mini Indonesia Indah*

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Day 4: Thursday, October 6, 2016



Fig 10. Third plenary session

Before the closing ceremony begun, we held another plenary session which proposed “*Strengthening Research Collaboration and Networks*” as its general theme and invited speakers i.e: 1.) Director of Research and Innovation Bogor Agricultural University (Prof. Iskandar Z. Siregar), 2.) CIFOR (Mr. Terry Sunderland), 3.) Vice Dean of Faculty of Forestry, Bogor Agricultural University (Dr. Lailan Syaufina) and 4.) Director of Social Economic Forest Policy and Climate Change Center – MoEF(Dr. Bambang Suprianto). Second agenda of the day was scientific networking which lead by Dr. Lukas Giessen and Dr. Dodik Nurrochmat. Finally, the conference was closed by the Vice Rector of IPB (Prof.Dr.Ir Hermanto Siregar, M.Ec).

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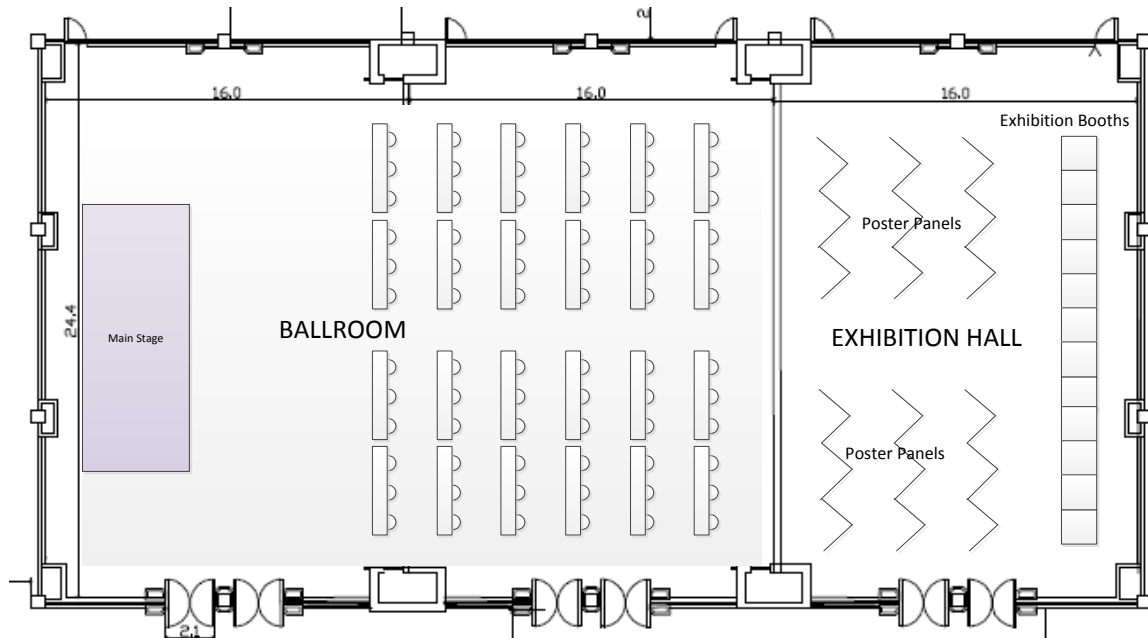


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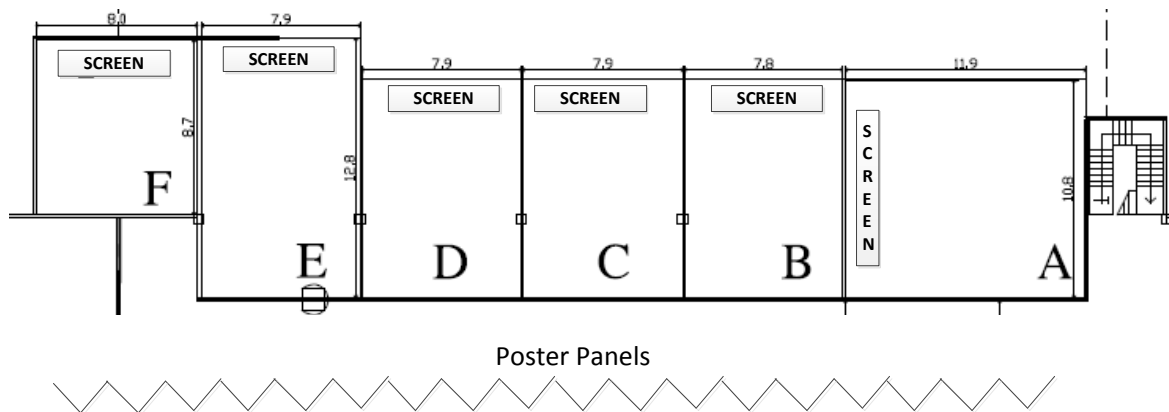


## Appendix 1 Venues Layout

### a. Ballroom and Exhibition Hall



### b. Technical Session Rooms



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Appendix 2 Exhibition documentation



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## Appendix 3. List of Abstracts

### FOREST AND ENVIRONMENT GOVERNANCE

#### Sub-theme:

Session 1.1. The global-nexus in forest governance

Chairperson(s): BJM Arts (University of Wageningen the Netherlands). bas.arts @ wur.nl

#### **Shifted Discourse, Shifting Power: How Climate Change Mitigation and Justice are negotiated in Indonesia.**

Galudra, G. (World Agroforestry Centre, Indonesia), Ros-Tonen, M.A.F, Gupta, J., van Noordwijk, M. (Amsterdam Institute for Social Science Research (AISSR) and Centre for Sustainable Development Studies, University of Amsterdam)

Most of the global climate change mitigation discourses are dominated by two contradicting discourses: ecological modernization and the civic environmental discourse. They shape and determine how climate change mitigation practice and justice are governed in Indonesia. Based on discourse analysis, this study aims to explore the relations between these two prominent discourses and the way they govern climate change mitigation practices in Indonesia. We hypothesize that climate change mitigation outcomes in Indonesia are not only the result of these co-existing of two dominant discourses, but also by the collective decision-making and authority of different interest groups across multiple levels of scale. The various interest groups develop new discourses that reshape and redirect the national policies. Our analysis suggests that Indonesia's concerns about the carbon market and financial system, along with the newer concerns about forest governance reform on forest transparency, accountability and equity and the emergence of new coalitions and their resistance, has led to the plurality of discourses and justice, with potential implications for Indonesia's climate change policies.

#### **Multi-level Governance of Climate Change in Forests and Agriculture in Indonesia.**

Di Gregorio, M. (University of Leeds, Center for International Forestry Research), Nurrochmat, D. (Bogor Agricultural University), Sari, I., Kusumadewi, S. (Center for International Forestry Research)

This paper investigates the multi-level governance (MLG) challenges and opportunities for integrating climate change objectives in the land use sector in Indonesia. Pledges to reduce carbon emissions in AFOLU and the need to address climate change impacts of a large population depending on agriculture and forest are reshaping forest governance and create the need for improved cross-level cooperation to manage these challenges in Indonesia.

The study adopts an innovative institutional approach that integrates institutional, discourse and social network analysis to study MLG (Young 200, Hayer 2005, Scott 2000).

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It understands MLG as ‘the existence of overlapping competencies among multiple levels of governments and the interaction of political actors across those levels’, which result in ‘multi-level policy networks’ in a multi-actor polycentric polity structure (Marks et al. 1996: 41, Mayntz 1994, Ostrom 2010).

Based on Young’s (2006) suggested determinants of cross-level interactions, it investigates how authority and power differentials, contrasting discourses, and cross-level interactions of policy coalitions shape MLG processes and outcomes around climate change, forest and agriculture in Indonesia. The study is based on fieldwork undertaken between in 2014-2015 in Indonesia and interviews with 120 international, national, provincial and district level policy actors in Indonesia.

### **Legitimation in Networked Governance Arrangements: The Case of Global Forest Governance**

Isailovic, M. (Institute for Environmental Studies, VU University Amsterdam)

Today we can observe that besides the international regime, another set of governance arrangements have emerged that are built on non-hierarchical steering, and are characterized by decentralized, voluntary, market-oriented interaction between public and private actors. Such arrangements that mostly operate at transnational level include a variety of different types of initiatives such as club like forums, voluntary or compliance markets, public-private partnerships, transnational municipal networks, etc. Such new institutional landscape has implications of how public and private authority has been rearticulated. The institutionalization of such forms of governance and blurring of the public and private divide have increasingly become the focal point of debates on legitimacy of global governance. In this new context, legitimacy has to be considered from an innovative perspective and especially in terms of linkages between authority and discursive structure permeating problem framing, decision making and institutional arrangements. In addition, such approach has to be complemented by looking at the political dynamics among different processes and practices of governance that merge transnational and the interstate negotiations. Accordingly, this paper applies an innovative framework from discursive intuitionist perspective in examining legitimation processes in the case of forest networked or hybrid form of governance.

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Sub-theme:

## **Session 1.2. Forest Governance: Improving Forest Sustainability in Countries in Transition?**

Chairperson(s): Peter Edwards (Scion & Victoria University of Wellington).  
peter.edwards@scionresearch.com

### **Strategic Analysis of *Shorea Spp* Seed Sources Management at Haurbentes Forest Areas for Special Purposes**

Putri, K.P, Syamsuwida, D. (Forest Tree Seed Technology Research and Development Centre) Supriyanto, Syaufina, L. (Faculty of Forestry, Bogor Agricultural University)

Haurbentes forest areas at Jasinga sub district, in Bogor is one of forest areas appointed as Forest Areas for Special Purposes (FASP) of which research and development activities are conducted. The role and function of FASP are currently developed become seed sources and germplasm conservation especially for the species of *Shorea*. In fact, there are some obstacles and problems faced to conserve the seed sources of *Shorea* management. The objective of the study is to establish a strategy of *Shorea spp* seed sources management at Haurbentes FASP. The institutional strategy formulation used an approachment of SWOT analysis by determining the stages of identification, assessment and formulation of strategies toward the internal and external factors. The analysis results revealed that the management of *Shorea spp* seed sources in Haurbentes FASP was in the second quadrant of SWOT diagram. The strategy employed was diversification with the consideration that *Shorea spp* seed sources possessed a high potential to be developed, however it still faced an external threat. The alternative strategies were 1) make the seed sources of *Shorea spp* in Haurbentes FASP as a field laboratory and a show window of Innovation, Research and Development Agency, 2) improve a networking with some related parties to establish demonstration plots outside the forest areas of Haurbentes, and 3) give a recommendation to the other unit of Directorate General to develop *Shorea sp* in areas of Timber Estates, Community Forest Plantations, Community Forests or degraded lands, by using cropping mixture with other fast growing species.

### **Multilevel Governance on the Forest-Agriculture Interface**

Van Dexter, K. (George Mason University, World Wildlife Fund)

Addressing the global challenges of climate change, food security, biodiversity conservation and poverty alleviation depends on enhancing the adaptive capacity and mitigation potential of forest-agriculture systems. Drawing on empirical evidence from the Democratic Republic of the Congo and Colombia, this paper analyzes the relationships between various governance instruments shaping forest-agriculture practices, and related outcomes for conservation and sustainable development goals. It

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examines land use production systems among indigenous and smallholder communities and emerging governance arrangements within the context of forest reforms and forest-related climate initiatives, and identifies opportunities and challenges for conservation and rural livelihoods including through agroforestry practices that link food and forest production. Agroforestry as a model of an integrated land use approach is essential to (in situ) conservation and development, however evidence and understanding of the different production systems and institutional and policy arrangements that enable forest and climate outcomes are currently lacking. This paper provides insights regarding the possibilities for forest conservation and sustainable management to support synergies in the land sector to meet multiple climate, conservation, and sustainable development outcomes.

### **Cost of A Path Change: Conservation Policy-Standoff in Malaysia's Central Forest Spine**

Maniam, A. (Department of Administrative Studies and Politics, Faculty of Economics and Administration, University of Malaya, Malaysia; Politics and International Relations, School of Social Sciences, Faculty of Arts, University of Auckland, New Zealand).  
agkillah@um.edu.my, anma441@aucklanduni.ac.nz

Despite having established the Central Forest Spine (CFS) policy, the Malaysian government is still struggling to execute this forest and wildlife conservation policy in its entirety. The CFS policy comprises of an extensive spatial plan involving eight out of eleven states in Peninsular Malaysia. The policy currently faces varying degrees of implementation success among states involved. The division of powers under Malaysia's federalism structure is often blamed for this variation; as powers over land and forests are held by state governments while the federal government holds prerogative to jointly administer wildlife and birds. Furthermore, natural resources is one of the main sources of income for states. This paper argues that the actual standoff for this policy is due to path dependence present in Malaysia's forest and wildlife agencies. The development pathway chosen during early post-independence period overpowers the need to conserve and preserve forests and wildlife – causing potential path inefficiency. Many states find the newly introduced path of conservation to be costly, or depriving them of a better developed future equipped with modern infrastructures. Though the cost of path switch may seem expensive, the cost is cheaper compared to the impact Malaysia may face upon the loss of biodiversity.

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Sub-Theme:

### **Session 1.4. Brokering Knowledge, Mediating Interests: The Impact of Institutions at the Forest Science-Policy Interface across the Globe**

Chairperson(s): Susanne Koch (Technical University of Munich). susanne.koch@tum.de

#### **Integrating Science into Environmental Policymaking: Insights from South Africa**

Koch, S. (Forest and Environmental Policy, Technical University of Munich)

How to integrate science effectively into forest and environmental policymaking has become an exigent question for governments all over the world. Overcoming the prevailing science-policy gap is particularly challenging for developing countries whose institutional fabrics are usually weaker than those in the global North. Hence, it is even more noteworthy that many success stories about conservation approaches based on cutting-edge science come from South Africa.

The country's success in environmental governance and, particularly, biodiversity management, seems to rest on specific intermediaries that provide for continuous interaction between the political and academic spheres as well as on structural conditions that are rather unusual in developing regions. This is suggested by empirical research based on comprehensive document analysis and expert interviews with actors in government entities and conservation agencies at the national and the provincial level.

Drawing on boundary theory as developed by STS, the paper analyses South Africa's organisational 'set-up' to reveal which kind of elements facilitate effective science-policy interaction. Thereby, it identifies the South African National Biodiversity Institute (SANBI) as an important boundary organisation. Moreover, it highlights two enabling factors that seem decisive for its impact, namely an 'absorptive' administration with highly capacitated staff and a strong local science community.

#### **Failure of Knowledge Transfer in Upper Area: Case in Improving Electric Hydropower Plant, Indonesia**

Dharmawan, B. (Chair Group of Forest and Nature Conservation Policy, Georg-August-Universität Göttingen, Faculty of Agriculture, Jenderal Soedirman University) and Böcher, M. (Chair Group of Forest and Nature Conservation Policy, Georg-August-Universität Göttingen)

Successful scientific knowledge transfer in regional policy depends on how science is integrated into the interests from local and regional governments, local citizens, and other actors and institutions which are involved. Science-based recommendations are often difficult to be implemented especially when science-based solutions lead to distributional conflicts producing winners and losers. A new model of science-policy interactions, the RIU (Research-Integration-Utilization) model is applied in this case study

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on energy policy in Indonesia. According to RIU, scientific knowledge is produced within the science system ('research') and science-based solutions to problems are practically utilised by political actors ('utilisation'). The crucial links between research and utilisation must be made by processes of 'integration'. Our study finds that conflicts of interests involving vegetable farmers who encroach upper forests lead to sedimentation that damages the turbine at lower electric hydropower plant. The encroachment is also creating drought to the dam during dry season. Research suggests that it needs sufficient water to fill in the dam to electrify more than ten sub districts. In the integration process, the national electric company has an interest to increase the electric capacity of the hydropower plant. They need support from the district government to realise their plans. The use of research is incorporated in district government regulation to restrict farming in upper areas, however the objection toward regulation comes from farmer in neighbouring districts who cultivate the forest area with vegetables. The farmers are supported by the government in this district that gets benefits from the farming. Our study demonstrates the analytical potential of the RIU model that helps in this case to reveal several interest conflicts between local actors resulting from science-based solutions and respective integration processes. We can show that those science-based solutions are realized that are supported by stronger and more powerful allies.

### Off-farm Jobs and Reforestation: Evidence from China

Liang, W. (Renmim University of China)

Forest cover change directly affects biodiversity, ecosystem function and climate. While many countries are still faced with deforestation, reforestation happens in some countries at national level. Some researches emphasize the importance of releasing rural population pressure on forest land. The main proposition is labor migration from rural to urban areas or off-farm jobs could release land pressure. Once local people find it unprofitable to live through agricultural activities, then forest regeneration may happen in the marginal fields. It sounds attractive since poverty reduction and reforestation may be achieved simultaneously. It requires empirical evidences to support the proposition. However, researches so far lack reliable data sets to prove the above proposition. In this paper, we use two sets of data to get empirical evidence. One panel data set of China between 1981 and 2013 is used to analyze relationship between the amount of primary labor and forest areas. Another micro household data set which is published by CHIP2013 is used to analyze the likelihoods for farmers to abandon farmland conditioning on different level of farm labor force. Our empirical findings support the negative relationship between agricultural labor force and forest areas. The explicit policy suggestion is that providing more off-farm jobs and promoting urbanization may contribute to reforestation.

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## Multi Landscape Forest Management of Small Islands in the Moluccas Based On Green Economy

Kastanya, A. (Pattimura University Ambon). aguskastanya@yahoo.com

The exploitative and centralistic economic development of Indonesia has had a negative impact on the land, coastal areas and oceans causing poverty in communities.

Effects of global warming and climate change require change in the paradigm towards a green economy to prevent a 20 C increase in earth's temperature, which will damage the world and its living creatures. Spatial analysis and Geo Information System (GIS) analysis was used in this research. Operational analysis used the framework of the Integrated Management Model of Small Island Landscape (Kastanya, 2002; 2012; 2014) which contains a conceptual, macro and micro framework.

The research results require a change from an exploitative economy to a green economy as a basis for policy and renewal of regulations at a central and regional level, in accordance with the eco region's diversity. The macro concept integrates the multi landscape of small islands i.e. the island cluster, the island and its short, narrow watershed, as the management foundation. Integration results show 12 island clusters consisting of 1,340 islands with 1600 water set in the Moluccas. While in North Moluccas there are 8 island clusters, 600 islands and more than 600 watershed. All land use and systems, forest functions, socio-cultural information, tenancy and native title rights have already been integrated into the watershed of the islands and island clusters. The micro concept details sustainable management of forests and other land use areas into management units based on the agroforestry landscape so each multi landscape unit achieves sustainability and community prosperity.

Sub-Theme:

### **Session 1.6. Illegal Logging Policies across the Globe: Developments and Prospects**

Chairperson(s): Ellyn K. Damayanti

#### **The Socioeconomic Characteristic of Forest Encroachers in Forest Management Unit Dharmasraya District, West Sumatra, Indonesia**

Yurike, Yonariza, Febriamansyah, R, and Karimi, S (University of Andalas)

Forest cover in Dharmasraya has lost as many as 22,584 ha within last decade of the 33,500 ha of forest area. The area is supposed to be a secondary forest has been turned into plantations. The purpose of this study to determine the characteristics of forest encroachers in the Dharmasraya district, and to identify local land ownership either by native people or immigrant ones. The methodology used is the household survey, key informants, and satellite data/GIS, using descriptive quantitative. The results showed that the community forest encroachers are a category of productive age with low levels of education, land ownership in Dharmasraya is communal clan land, the ruling clan Melayu

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Clan of Minangkabau ethnic. Based on the characteristics of the economy, income encroachers is high, encroachment occurs not because of economic pressure, but because there is an opportunity to invest in land. There is no forest law enforcement by the government to sanction the rogue elements who sells forest land to the immigrants. As a consequence, land ownership of immigrants is greater as compared to the local's. Weak law enforcement in this area facilitate community forest land encroachment, the same also hold true for the government's lack of attention and socialization to the community.

### **Forests for Carbon, Water, Food, Energy and Livelihood: Trade-off and synergies**

Kim, Y.S, Latifah, S, Fisher, L and Afifi, M. (Northern Arizona University, USA and University of Mataram, Indonesia). [ysk@nau.edu](mailto:ysk@nau.edu)

Despite a recent explosion of interest in global payment for ecosystem services (PES) mechanisms, such as REDD+, there has been little comprehensive assessment of their impacts on localized ecosystem services and livelihood. Better understanding of the localized impacts is needed to find ways of balancing ecosystem services that provide benefit at the global scale, while meeting local needs for water, food, energy and livelihood. We assessed trade-offs and potential synergies between international ecosystem service payment schemes (such as REDD+ for forest carbon) and localized regulating (e.g. water) and provisioning (e.g. forest products for food and energy) ecosystem services using a case study from eastern Indonesia. The results show empirical evidence that without careful consideration for localized impacts, the PES mechanism for global ecosystem services can have negative consequences to local ecosystem services. We present management alternatives to maximize positive synergies among provisions of different ecosystem services in varying scales.

### **Factors influencing likely adoption of REDD+ in community forests: Evidence from watershed level analysis in Nepal**

Pandit, R. (School of Agricultural and Resource Economics, the University of Western Australia). [ram.pandit@uwa.edu.au](mailto:ram.pandit@uwa.edu.au)

Reducing Emissions from Deforestation and Forest Degradation in developing countries (REDD+) has been piloted in several countries, where local communities rely heavily on forests for livelihoods. This paper examines the factors affecting likelihood of households adopting REDD+ in community forests (CF) based on a survey from two REDD+-piloted watersheds in central Nepal. The logistic regression results indicate that household specific characteristics (fulfilment of timber demand from CF, economic status, number of cows, and amount of rain-fed land), REDD+ related characteristics (familiarity with REDD+ goals, area of dense forest per household) and respondent's age affect the likelihood of REDD+ adoption. But the nature and magnitude of these effects vary considerably between the watersheds. These results imply that local contexts is at the centre of the likely adoption of REDD+ in community forests. Therefore, long-term

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engagement of local communities in REDD+ needs to be carefully considered inline of the biophysical characteristics of the forests and the economic and socio-demographic settings of the forest users.

### **Is Social Forestry Program Solution for Reducing Forest Degradation? (Case Study on Tesso Nilo Community)**

Desmiwati (Forest Tree Seed Tecnology Research and Development Centre, Ministry of Environment and Forestry), Mariati, S (Tourism Study, University of Trisakti) and Christian, FY (Rural Sociology, Bogor Agricultural University). [desmiwati.wong@gmail.com](mailto:desmiwati.wong@gmail.com)

The social forestry program as a conscientization building, knowledged and responsible forest resources preservation, and as social economics benefit supply for forest community has been long implemented as one solution for forest degradation. However, after a long period of field implementation, the forest degradation still continues in national level. This research aimed to evaluate whether the social forestry still relevant as solution against forest degradation by taking one case in Sumatera forest, particularly in community near Tesso Nilo National Park, Province of Riau through analyzing the social forestry practise and the impact on the protection of Tesso Nilo National Park. Result of study shows that the pace of forest degradation can be suppressed through promoting non-timber forest product and ecotourism. These approach provenly improving productivity, wealth distribution and maintain the forest resource preservation through effective community participation. Relating to unequal power relation in forest governance identified during this research is considered as a tough challenge for future program. To improve the effectiveness and the sustainable impact of social forestry, the institutional revitalization based on local cultural values and set of rule relating to access and land control is crucial to address for future social forestry program fortification.

### **Farmers movement in efforts to reclaim the land from big logging companies in the case of Mount Ungaran and Mount Kendang, Central Java**

Isailovic, M. (Institute for Environmental Studies, VU University Amsterdam).  
[marija.isailovic@vu.nl](mailto:marija.isailovic@vu.nl)

Mount Ungaran and Mount Kendang serve as imortant watershed areas for the lowland cities of Central Java in Indonesia including Semarang, Blora and Cepu. They are considered as cites rich in biodiversity, timber, and other forest products, as well as land suitable for agricultural purposes. However, this area experienced a high level of deforestation due to increased logging activities by timber and cement companies, as well as increased farming practices, and inadequete logging rules and regulation. As almost all of the production forest belongs to Perhutani, a private instituion established by the state that possess the full authority to manage the forest land for industrial purposes and timber products for profit, many of the farmers self-organized in efforts to

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reclaim the land.

This paper present research on the comparison between two villages in these two mountains as dinstinct cases where in one case farmers reclaimed their land from Perhutani, while in other the farmer movement was unsuccessful. Accordingly, this paper will explore under which conditions discursive practices farmer groups employed were with higher transformative power on dominant authority then in the case where the land still belongs with Perhutani. This paper employs discursive framework on examing transformative power where authority is understood as legitimate power on decision making.

**Sub-Theme:**

### **Session 1.7. Decentralization and Forest Governance Transformation**

Chairperson(s): Liu Jinlong (Renmin University of China)

#### **Interests of Forest Bureaucrats in Community Forest Management Plan Revision in the Western Hills of Nepal**

Basnyat, B. (Institute of Forestry, Tribhuvan University, University of Copanhagen), Pokhare, R. (Tribhuvan University), Treue, T. (University of Copenhagen), Lamsal, Lokh N. (District Forest Office, Kaski) and Rayamajhi. S. (Institute of Forestry, Tribhuvan University)

In Nepal, forest management plans, endorsed by district forest offices, form the legal basis for community forest user groups' perpetual and exclusive forest rights. However, the forest bureaucracy uses inbuilt, but *not* legally required, expiry dates of such plans to its political and economic advantage. Based on a rapid survey of seventy-six forest user groups, thirty amended management plans, stakeholder consultations, and intensive interactions with six forest user groups whose plans were amended last year, two different arrangements to plan revision were identified, which include exclusively by forest officials and contracting out. Funds were received from government, donors or community. None of the approaches complied with prescribed processes and often biophysical data were manipulated to comply with official requirements. Consequently, all revised plans were almost identical to their previous versions and modifications mostly the result of desk exercises. The study concludes that the forest bureaucracy uses plan revisions to reinforce official and un-official rules that strengthen or re-establish its control over harvesting and marketing of forest products, while pretending to meet donors' interests of sustainable forestry. Furthermore, forest bureaucrats generated official and unofficial incomes through allowances and logistical support from the government, service providers, donors and forest user groups.

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## The Drivers of Collaboration at the Local Level: What is needed for Individual Private Forest Owners to Start Collaborating in a Context of High Trust and Soft Regulation?

Mancheva, I. (Department of Political Science, Umeå University)

The current turn towards more collaborative forms of natural resource management has been supported by both research literature and legislation. An example of the latter is the EU WFD which endorses collaborative governance of water resources within the member-states, as opposed to top-down management. However, in order for collaborative governance to be successful or even possible, the actors who have considerable power over decision-making within that management have to be willing to and actively participating in that collaboration. Building on Emerson et al.'s (2012) theoretical framework on collaborative governance, this paper looks into the drivers behind that willingness, through testing one of their propositions on the drivers necessary for the initiation of collaborative governance. The proposition was tested empirically by focusing on the lowest (governance) level – the local and the individual forest landowners within a Swedish context, and through conducting both a survey and qualitative interviews with key stakeholders. The aim was to bring more clarity on what preconditions are required in order for legislation which promotes collaborative governance of water resources to actually work, and key stakeholders to participate in that collaboration. The results showed that collaboration is not initiated in the absence of the scrutinised drivers and in a context of soft regulation and high trust in stakeholders. Furthermore, when comparing to a case within a wider geographical context where active collaboration exists, the importance of *leadership*, *consequential incentives*, *interdependence* and *uncertainty* becomes evident.

## Designing Stakeholders Cooperation based on Payment for Ecosystem Services for Natural Tourism in Halimun Salak National Park, Indonesia

Istiqomah, A., Ekayani, M., Tampubolon, B. I. (Bogor Agricultural University)

Natural tourism activity in National Park could potentially interfere with the preservation of the National Park. This is also happen in Gunung Halimun Salak National Park (TNGHS) due to the different level of importances and influences of multi-stakeholder involvement in the tourism management. Thus, it needs a proper tourism management based on Payment for Ecosystem Services (PES). The implementation of PES concept in conservation area requires institutions that can ensure the flow of benefits from natural tourism activities to those that contribute to the sustainability and preservation of natural resources and environment. Based on Focus Group Discussion (FGD) and institutional analyzes (Actor Grid) of natural tourism management in Gunung Sari and Gunung Bunder village as a part of TNGHS, the National Park Authority (BTNGHS) has same quadrant (as players) with Legiun Veteran Republik Indonesia (dominant player). Equality in importance and influence are critical point to improve the management of natural tourism and implementation design of PES in TNGHS. For the PES

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concept in natural tourism management, it needs public institutions to accommodate business unit in tourism and avoid free rider, and also bridge the BTNGHS with other parties to reach sustainable tourism governance.

### **Legitimacy and Authority: Enactments of the Nature in the Western Ghats Region in India**

Isailovic, M. (Institute for Environmental Studies, VU University Amsterdam).  
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The Western Ghats, extending along the west coast of India, covers an area of 180 000 square kilometres. Western Ghats region in India spreads over the states of Maharashtra, Karnataka, Goa, Kerala and Tamil Nadu, while in Sri Lanka it reaches over the highlands of the south west region. It is considered as one of 34 of all biodiversity hotspots for conservation of forest and related biodiversity. Moreover, many of the climate related policies such as REDD are planned in the area. At the same time it is a home to more than 400 deprived communities of Adivasis or scheduled tribes, a term used to denote about 8% of Indian forest-dependent ethnic minorities. As considered as one of the most contested areas, the question of legitimacy of different framings of the problem and the nature in the region is an important aspect to consider in relation to the marginalized population that inhabits this area. Accordingly, this article explores different discursive enactments of the Western Ghats region at the intersection of forest and climate governance, namely dominant and alternative accounts. Finally, it establishes different weightings of its enactments as linked to how authority is legitimized.

### **Recentralizing in Indonesia's forestry sector: Is province government ready to manage the forest? Case studies in Lampung Province, Indonesia**

Kaskoyo, H and Febryano, IG (Forestry Department, Faculty of Agriculture, Lampung University, Lampung, Indonesia). harikaskoyo@yahoo.com

While the majority of developing country launched decentralization, Indonesia's government emerged recentralization in forestry sector by issued UU no 23 in 2014. Decentralization policy in forestry sector has been authority transfer from central to district government based on government policy issue on 1999 and result some conflicts among district and confused some stakeholders relating to the forest management and access. Since then central government has gradually withdrawn the district's authority on forest management. This paper uses case study in Lampung Province to analyze the dynamics of decentralized process in Indonesia's forestry sector. Some staffs of a forest management unit in Lampung province level and some districts level was interviewed. Data was analyzed by qualitative method. The results of this study indicate that some forestry officer of local districts of Lampung province do not allowed to move to forest management unit, Lampung forestry office has not enough budget and officer to manage many forest management units, and has conflict potency between district government and forest management unit. This demonstrates that the recentralizing in forestry sector needs still enough district and central government support.

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## FOREST ECONOMY AND ENVIRONMENT POLICY

Sub Themes:

### Session 2.1. Forest in Transition: Challenges for Sustainable Development

Chairperson(s): Christine Wulandari (University of Lampung, Indonesia), Dodik R. Nurrochmat (Bogor Agricultural University). chs.wulandari@gmail.com, dnurrochmat@gmail.com

#### The Potential Role of Independent Smallholder Oil Palm Farmers in Biodiversity Conservation is undervalued

Sunkar, A, Santosa, Y., Hasta, Dian W., Suhartini, L. (Bogor Agricultural University)

Oil palm plantations tend to be overlooked by those interested in biodiversity conservation. Despite the frequent reports of the large oil palm plantations' lack of attention to biodiversity conservation, there is a paucity of reporting on smallholder oil palm contributions in this regard. Yet, various studies have concluded that vegetation variation supports richer biodiversity, and this is a characteristic of independent smallholder plantations. This paper discusses the potential role of independent smallholder oil palm farmers in biodiversity conservation. Data on community environmental perceptions of smallholder plantations, and biodiversity were collected on 16 plantations in Kampar, Pelalawan, Kuantan, Singingi and Siak. The research used direct interview with oil palm owners and community members, as well as direct observation to examine the environmental conditions of each plantation. Data on species were collected using a time-search method (butterflies), transect method (birds), and camera traps (mammals). Results showed that independent smallholder oil palm plantations were considered to be more environmentally-friendly with respect to provision of wildlife habitats. Most of the plantations have been shown to support higher biodiversity richness than large plantations. It can be concluded from this research that the informed management of independent smallholder oil palm plantations could effectively support biodiversity conservation.

#### Impacts of Laws No. 23/2014 to Development of Community Base Forest Management in Lampung Province, Indonesia

Wulandari, C. and Budiono, P. (University of Lampung)

Establishment of Act 23/2014 on Local Government impacted on the authority of forest resources management at the provincial and district levels, including community empowerment programs in Lampung Province such as Village Forest (*Hutan Desa*), Community Forest (*Hutan Kemasyarakatan* or HKM). This study concentrates on HKM only because it is the largest CBFM program in Lampung Province. As a result of declared

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Act 23/2014 then 16 PAK in 4 districts (16.961 Ha) of HKm candidate has to be cancelled, because according to the ministry, it cannot be extended. Under these conditions it is necessary to make a study to determine the impact and strategy of local government in dealing with Act 23/2014. The study was conducted on March-April 2016 with a qualitative approach. The selection of respondents uses purposive sampling method and then conducted a descriptive analysis. This research is revealed that local governments tend to wait until there are specific regulations set on HKm in accordance with Act 23/2014. However, it can be concluded that (1) Ministry should immediately publish the Ministry Regulation on HKm, (2) between the provincial government and districts should immediately make the coordination and setup the handover steps of personnel, funding, facilities, and documents.

### **Politics of Getting the Numbers Right: Forest Inventory in Community Forestry of Nepal**

Jamarkattel, S. J. (Institute of Forestry, Tribhuvan University, University of Copenhagen), Meilby, H. (University of Copenhagen), Chettri, B.B.K. (Institute of Forestry, Tribhuvan University), Basnyat, B. (Institute of Forestry, Tribhuvan University, University of Copenhagen), Rayamjhi, S. (Institute of Forestry, Tribhuvan University)

Using a case study approach, this research assesses the quality of forest inventory in community forests in the mid-hill region of Nepal. The study conducted forest inventory in nine community forests and compared results with previous inventories. Furthermore, forest officials and users were consulted about inventory processes along with review of management plans and inventory guidelines. The study found that inventory guidelines were frequently disregarded, both in inventory design and implementation. Likewise, forest inventories were either poorly conducted or results simply fabricated on the basis of previous inventories. Consequently there were significant differences between the results of inventories conducted by this study and inventories forming the basis for operational plans. The examined community forest inventories were of low standard and were not rooted in sound scientific principles. Furthermore, it turned out that growing stock volume was frequently manipulated to align with Government decrees, which specify that growing stock volumes should not exceed the national average of 178 cubic meters per ha. Seemingly, forest inventory serves to establish techno-bureaucratic authority and regulate harvest. Thus, community forestry inventories appear to act as a political means of getting the numbers right to satisfy bureaucratic requirements, rather than a tool for guiding forest management decisions.

### **Ecotourism as Payment for Ecosystem Services to address Socio-Economic and Ecological Issues in Halimun Salak National Park, Indonesia**

Ekayani, M., Nuva, Istiqomah, A. (Bogor Agricultural University)

The extension of National Park is not only providing benefits for nature conservation, but also creating a higher tension of social problem. The extended area of

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Gunung Halimun Salak National Park (TNGHS), for instance, causes a conflict of interest, due to a trade-off between its main function as a conservation area (ecological interests) and the economic needs of local people (economic interest). Ecotourism is one of activities in TNGHS that could become a potential problem solving. Since tourists pay for the ecosystem services, i.e. the beauty natural landscape and fresh air, which are provided by conservation activities, thus development of ecotourism could provide added value to the conservation area, improve people awareness and appreciation on natures, and provide economic incentive to manage and conserve natural resources, ecosystem, as well as income generating for local communities. This study proposes to use ecotourism as a scheme of payment for ecosystem services (PES) in TNGHS. This scheme is expected to be an alternative to provide a win-win solution for accommodating conservation and economic interests in the protected area. This study indicates that most people live within and surrounding TNGHS generate income from ecotourism. Due to this economic benefit, all stakeholders who participated in ecotourism will contribute to conserve the park in order to sustain their income. To implement PES successfully, it is important to develop proper and legal institution to avoid free rider, i.e. people with give no contribution, but take advantages from ecotourism in TNGHS.

### **Making Green Development Work: Formulating Strategies for Low Carbon Development Mechanism in Land Use Sector**

Nurrochmat, DR, Jaya, INS, Tiryana, T, Yovi EY, Pribadi R, Erbaugh, JT

Green development does not mean declining economic growth but a growth that is environmentally sustainable. This is another way of development to meet prosperity while using natural resources efficiently, not a competing paradigm of growth. In land use sector, “green” is closely related to and often means “low carbon” development. Low carbon development does not relate only to the technical aspects, but also needs to be supported and could be achieved among other by green fiscal policies. Accordingly, to ensure low carbon development goals in land use sector, it needs new schemes to reform fiscal policies towards more comprehensive, fairer, and more respect to environment. This study explores the weaknesses of the existing principles and mechanisms of low carbon economy and therefore, recommends set of schemes to implement green fiscal policy in land base sector by promoting policy instruments to the effective implementation of payment for environmental services, purchasing land use right, and liability rule.

### **Institutional stability for sustaining forest management in Indonesia**

Maryani, R (Research Center on Forest Policy, Socio Economic and Climate Change  
Ministry Environment and Forestry of Indonesia)

The article uses property right regime to explain how the management of forests in Indonesia being structured and regulated in the country. Under the ownership of state,

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central government set goals of forest management, it designs the policy and its implementation in accordance with the function of forests as defined by the government. Redefinition on the rules in forest management being identified to explain how the policy decentralization re-arrange the structure and re-define roles of the government in forest management. Factors that hamper or stimulate the policy decentralization to attain the goal for sustaining forest function being analyzed to explain in which way re-arrangement on the structure brings impact on forest condition. The author applies combine theory of institutions and the theory of access to enable this study in explaining empirical findings about perpetual deforestation and conflicts under the decentralized policy of forest management. In term of conceptual, this study recommends for attaining the goal of sustaining forests it is necessary to maintain stability of institutions by means of controlling behavior of political actors.

### **Evaluating Trade-Offs in the Agricultural Sector**

Leggett, M, Lubis, MI, Nuruliawati, Pusparini W. (Wildlife Conservation Society).  
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Indonesia's Aceh province has set ambitious agricultural production targets between 2015-2020. There is a risk that expanded agricultural development will result in forest loss, undermining the ecosystem services on which the agricultural sector is reliant. This study assesses existing government targets for rice and palm oil expansion in Aceh, and models the suitable remaining land area for expanded agricultural production, before analyzing the likely trade-offs which would result from meeting these agricultural production targets. Under a BAU scenario we find that meeting Aceh's palm oil production targets (500m/t by 2020) will require the conversion of 220,000 hectares of land - more than is available for production without expansion into existing protected areas or peatland forests. Meeting rice production targets under BAU productivity would require an additional 50,000 hectares of land. However, if yield increases are supported to reach industry averages (3.67 t/ha for palm oil), drastic reductions in the land required for conversion are possible (41,000ha less than baseline area for palm oil), while still meeting Government production targets. Without improved yields and a commitment to zero deforestation existing agricultural production targets will incentivise further conversion of forested areas, likely in the Leuser Ecosystem.

### **Change and Stability of Advocacy Coalitions in Preparing and Extending the Forest Moratorium of Indonesia**

Reonaldus, Termeer, K., and Hospes, O. (Public Administration and Policy Wageningen University)

Decision making about Indonesian Palm oil development is a complex political issue, due to controversies between powerful actor groups, representing economic, environmental and societal interests. Despite these controversies, a forest moratorium was launched in 2011 and extended in 2013 and 2015. This paper aims to understand the

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development and extension of this moratorium policy process and its underlying dynamics. For this purpose, an adapted version of the Advocacy Coalition Framework is used. Advocacy coalitions consist of actors from a variety of positions, who share a particular belief system, show a degree of coordinated activity over time and pool resources. The central questions are: What different advocacy coalitions have emerged during the preparations and extensions of the forest moratoria in 2011, 2013 and 2015? How to explain stability and change of and between different advocacy coalitions directed at establishing and extending the forest moratoria in Indonesia? Which advocacy coalitions dominated the decision-making processes in the palm oil subsystem and why?

Data were collected by interviewing people from 18 organizations and reviewing moratorium literature. Assisted with computer software Atlas ti, qualitative analysis was applied. The research revealed three advocacy coalitions in the first period: 'Climate', 'Green Growth' and 'Economic Development'. The Letter of Intent between Indonesian and Norway to implement REDD+ in Indonesia significantly shifted the dynamics. As a result, in the periods of the extension of the moratorium, the composition of coalitions changed: we identified two existing ('Green Growth' and 'Economic Development') and two new coalitions: 'Environmental' and 'Climate Justice'. During the extensions, the green growth coalition consisting of the Indonesian government and Norway, provided stability to the moratorium subsystem. Quite unexpectedly, the change of presidency did not lead to new changes of the coalitions.

**Forest and Environment Governance Based On Hidronomic Zone:  
Authority Board For Toba And Asahan Watershed, North Sumatera, Indonesia**  
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Economic development for 30 (thirty) years in Toba and Asahan watershed that drive by using the water of Lake Toba as a source of hydropower electricity in the upstream; followed by construction of an aluminum plant in the downstream have positive impact on the welfare of the surrounding community. Then, the construction of pulp and paper industry with its raw materials derived from Toba catchment area and the from the surrounding also give the positive impact on the welfare of the local and regional community. Besides those positive impact, various issues of environmental degradation has caused a decline in the quality of natural resources (water and land cover) around Toba and Asahan watershed which could hinder future development sustainability. This paper aims to identify the environmental issues of the development activities above and assesses the opportunities of an institutional interventions of authority agency/body-based "hidronomic zone", to overcome those issues. The method was used by field visited, literature review, interviews and discussions. The results show that there are nine (9) issues, namely: 1) forest cover conversion; 2) hydropower electricity; 3) pulp and paper industry; 4) fish farming; 5) soil and water conservation; 6) Samosir Island; 7) customary forest; 8) family conflict and 9) tourism and geopark. All of these issues will be integrated with the concept of "hidronomic zone" that is squeezed into a unified vision and mission of the development that will be the basis for the implementation of the tasks and responsibilities of the authority agency to be established. The establishment of the authority agency becomes the only hope to initiate

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the improvement of environmentally economic development in the area of Toba and Asahan watershed. This authority body also is an opportunity to address the overlapping interests of 8 districts; integration the implementation of main tasks and functions of the Ministry of Environment and Forestry according the P.18/KemenLHK-II/2015 that separated previously. This opportunity also strengthen by the authority agency experience in development of hydropower electricity in Asahan watershed and the government plans to propose Toba Authority Agency for tourism.

Sub Themes:

## **Session 2.2. Wildland Fires and Ecosystem Services: Effects and Economic Valuation**

Chairperson(s): Armando González-Cabán, Jose J. Sánchez (USDA Forest Service), Yeon-su Kim (Northern Arizona University).

### **Relevance of Ecosystem Services Values in Wildland Fire Management**

González-Cabán, A., and Sánchez, J (USDA Forest Service). agonzalezcaban@fs.fed.us, jsanchez@fs.fed.us.

Strategic fire management planning is a fundamental tool in management of fire protection programs at the local, regional and national level. One of the main goals of a fire management program is to conduct fuels treatment to reduce the risk of wildland fire occurrence. Fuel loads reduction contributes to ameliorating fire intensity and helping suppression efforts in the event of a wildfire. Overall fuel treatments are very expensive and difficult to perform most everywhere and in particular in the wildland urban interface settings. Using as an example the San Jacinto Ranger District of the San Bernardino National Forest, California, we propose a methodology to evaluate the efficacy of fuel treatments by estimating their costs and potential costs/losses with and without fuel treatments. This is a relevant issue because of the high cost of resource, including ecosystem services, at risk. We chose four different land use types in the San Jacinto wilderness – real estate, mixture of real estate and wilderness, recreation use and non-use. We ran the FARSITE fire simulation model iteratively for each area, using 100 random starting locations and 100 random weather scenarios. Weather data was obtained from a remote automatic weather station data stream and a high-resolution weather model called Fire Buster.

Heuristics for simulating suppression tactics were based on rates of actual fire line production in different fuel types and site characteristics, distance to fires, actual dispatch rules, retardant drops, and simulated fire suppression resources. To perform realistic fire spread simulations we incorporated simulated fire suppression resources. We applied actual collected treatment data over the landscape and adjusted fuel models using GIS-based ArcFuels to simulate fuel treatments.

To estimate the economic value of each land-use type we used real estate values, and ecosystem services values for recreation and water resources. Actual data was used to estimate suppression and fuel treatments costs. The results of the batch fire

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simulations together with the estimate land values and cost data, were used in a benefit-cost analysis of and in computing trade-off costs analysis of fuel treatments and fire suppression within the San Jacinto Ranger District.

### **Meanings and implications of media discourse concerning transboundary haze in Indonesia**

Porter-Jacobs, L., Dressler W., (School of Geography, The University of Melbourne),  
Carmenta, R. (Equity, Gender, Tenure Research Group, Center for International Forestry Research, Bogor, Indonesia)

In 2015, transboundary haze from intensive landscape burning reached disproportionately high levels across Southeast Asia. Accompanying the physical existence of fire and haze were new and often alarming discourses and strong rhetoric of change towards a new haze and fire-free reality. The haze originates from peatland fires that are a result of significant and often contested, land-use changes driven in response to global demand for food, fuel and fibre, and recently increased demand for crude oil palm, pulp and paper. The haze results in significant impacts across scales, including on public health, economy and the environment. Understanding and deconstructing dominant discourses, particularly the wide-reaching discourse of the media, is important to reveal alternative perspectives, debunk common misconceptions and oversimplifications regarding the haze. As such, this paper analyses the media discourses surrounding the 2015 haze event, in Indonesian and Singaporean media. This study focuses on the framings of blame and accountability as proposed by diverse groups, including international and national policymakers, communities, the private sector and civil society, and their preferences and representations of fire management interventions (FMI). In turn, this analysis can shed light on the political economy and power relations that ultimately lead to the haze.

### **Reducing Forest and Land Fires through Good Palm Oil Value Chain Governance**

Purnomo, H. (Center for International Forestry Research, Bogor Agricultural University),  
Dewayani, A.A., Achdiawan, R., Beni Okarda (Center for International Forestry Research),  
Ali, M. (Cooperation Riau Forest Rescue Network), Komar, S. (World Wildlife Fund (WWF) Indonesia Program)

Palm oil is a fantastic land-based commodity to support regional and national economies. With 11.4 million ha plantation, palm oil has contributed USD 21 billion to Indonesia's export, the biggest after oil and gas. However, fire has involved in the development and re-planting of palm oil plantation. The President of Indonesia aims to launch moratorium of the extension of palm oil plantation in the coming months. Previously the government lauched ISPO (*Indonesian Sustainable Palm Oil*) in 2011 to develop economic, social and environmental friendly palm oil. To date, there are only 20% of companies are ISPO certified. The research is answering the questions of 'who gets what' from palm oil economy, its value chain governance and reducing fire with

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better governance. The research using methods of reviewing the previous investigations, focus group discussion, field visit and value chain analysis. We found that palm oil can be solution for local and national development if it is sustainably developed. Otherwise, it will involve economic rent seekers including illegal forest and land claimer, slasher and burner. Four strongest actors in the palm oil governance are refinery owners, mill owners, large plantation owners and mid-scale plantation owners. These four actors set the palm oil standard, quality and trade along the chains. Solutions can be proposed to reduce fire and increase equity in the chains are strengthening farmer association, moving-up to the higher value chain stage and green product scenarios.

### **Wildfires and Ecosystem Services in Native American Forests**

Kim, Y., Fulé, P. Z., Meador, A. S (School of Forestry, Northern Arizona University)

Frequent wildfires in low-moderate intensity had been a critical process that maintained forest ecosystems in American west before European settlement. After centuries of old-growth logging, overgrazing, and, perhaps most significantly, fire exclusion, forests across the western United State are under increased risk of uncharacteristically large and severe wildfires and critical ecosystem services face threats. In partnership with two tribes in Arizona and New Mexico, we assessed historical fire regimes and their changes over time, as well as flow changes of ecosystem services that the Native American forests have been providing. We characterized changes in management practices and their effects on forest conditions in terms of ecosystem services delivery. We argue that management practices focusing on short-term delivery of easily quantifiable ecosystem services have had detrimental impacts on ecosystem resilience on these forests. We propose alternative management practices that may enhance future ecosystem resilience and critical ecosystem services.

### **Resource Management and Forest Quality: Evidence from the Reform of Collective Forest Right System**

Tuoyuan, Xu (Department of Agriculture and Rural Development, Renmin University of China)

This paper is based on 2002 to 2009 provincial panel data in China, combining with the quasi natural experiments characteristics of exogenous policy of collective forest rights reform promoted gradually in 2003 at the provincial level, using double difference model to estimate the effects of resource management on forest resources, which facing the endogenous problem between the resources management and the forest quality ignored in previous studies. Finally, the robustness test of the model is carried out in this paper. The results show that: first, the policy of reform of collective forest right system can significantly improve the quality of forest, the average growth is about 8.970%, but there is remarkable difference between north and south of this policy in improving forest quality, second, the policy of reform of collective forest right system can significantly reduce the number of forest fires by 41.8%, northern forest fire occurrence frequency damping is 30.7%, southern forest fire occurrence frequency damping is 44.0%, third, the

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effect of management and protection on forest resources quality is 21.46%, when the forest fire frequency decreased by 1%, the forest quality will corresponding to increase by 21.46%, and the effect of the management of forest resources quality in the north is much higher than that in the south.

### **Economics Losses and Forest Fire's Causes (Case Study: Ranu Pani Resort, Bromo Tengger Semeru National Park Indonesia)**

Suprihatin, AJ, Ekayani, M, Tampubolon BI, and Pramudita D. (Bogor Agricultural University)

Forest fires are one of the important issues in Indonesia that periodically occur. Bromo Tengger Semeru National Park (TNBTS) is a conservation area which often experience a forest fire, especially in Ranu Pani Resort. The area became the entrance to the hiking trail for tourists and the area directly adjacent to the enclave village. People who own land near to the conservation area suspected as a potential cause of forest fires in addition to natural factors. Forest fires result in economic losses both for the state and communities around the national park area. Thus, the aims of the research are to determine the amount of economic losses and the factors that affect forest fires. The analytical methods used in this research are loss of earnings, benefit transfer, logistic regression, and descriptive analysis. Based on the research, economic losses from forest fires reach 2.2 billion rupiah which is experienced by communities and area manager. Natural factors which significantly affect forest fires is rainfall, while the human factor is farming activity. Communities and area manager should pay attention to the patterns and the causes of the fire as an early warning system to prevent forest fires.

#### **Sub Themes:**

### **Session 2.4. Bridging Social-Economy and Ecological Interests in Conservation Area Management**

Chairperson(s): Akhmad Fauzi, Meti Ekayani (Bogor Agricultural University)

### **Economic Impact of Natural Tourism: Driving Community's Participation for Conservation in Halimun Salak National Park, Indonesia.**

Ekayani, M., Nuva, Pramudita, D, Osmaleli (Bogor Agricultural University, Indonesia)

Natural tourism development in protected areas is expected to provide added value for the area, not only to ecological but also economic functions. An appropriate natural tourism management can provide income to the park management which can be allocated for conservation as well as provide economic impact for local communities. Huge economic benefits to the communities may increase their awareness and participation in conservation activities as long as they get income from natural tourism

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activities. Thus, this research' aim is to determine the contribution of revenue from tourism activities for households and Halimun Salak National Park management (TNGHS). The analytical methods used are the analysis of tourism' source of income share on total household income, tourism income covering on household expenses, and covering on conservation fund. The results show that the share of tourism income on total household income is 66%. Tourism income can also cover 91% of household expenditure of local communities. It means that income from tourism activities has become a main livelihood source to meet their needs. Accordingly, the communities in TNGHS are also willing to conserve national park area. Potential income from non-tax revenue can support national park management to cover regular conservation expenses of TNGHS.

### **Safeguarding National Park Through Community Forests and Nature Conservation Policy Reform in Lombok Island, West Nusa Tenggara, Indonesia**

Nurrochmat, D.R., Massijaya, M. Y, Jaya, I Nengah S. (Bogor Agricultural University),  
Abdulah, L. (Ministry of Environment and Forestry (MoEF), Indonesia), Erbaugh, J.T  
(School of Natural Resources and Environment, University of Michigan)

Illegal logging and encroachment of forestlands are the main drivers of deforestation in Lombok Island in the last two decades. However, recently increasing frequency of floods and landslides in this island has enhanced the awareness of people towards ecosystem restoration. This study confirms that community participation is an important factor to protect forests, among others through involvement in ecotourism activities at Gunung Rinjani National Park and participation in agroforestry program in the park's buffer zone. A project of Reducing Emission from Deforestation and Forest Degradation Plus (REDD+) has been initiated by Indonesian government in cooperation with Korean investor and local community in Lombok Island through establishment of community forests (CF) for more than five years. Although the CF has been successfully implemented in several areas of production forests and protection forests, this scheme is a newly introduced government policy in reforming nature conservation areas' management in Indonesia. Through this scheme, local community has a bundle of right to manage a piece of forestland in and around Gunung Rinjani National Park. In addition of giving access to manage forestland, this scheme gave also supports in empowering capacity of local community to manage forests in more sustainable ways, e.g. through utilization of non-timber forest products, cultivation of crops on land under the forest stand, and rehabilitation of degraded forest lands. This study evaluated the implementation of CFs and proposed options for nature conservation policy reform in Lombok Island.

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## Where Science Meets Communities: Developing Forest Restoration Approches for Northern Thailand

# 50

Elliott, S. (Forest Restoration Research Unit, Chiang Mai University)

This paper contrasts lessons from two forest restoration projects in Doi Suthep-Pui National Park, northern Thailand, which combined science with community needs. Collaborating with the Hmong community of Ban Maesa Mai, Chiang Mai University's Forest Restoration Research Unit (FORRU-CMU) established plots to test the framework species method, from 1997. The project developed successful restoration practices and gained insight into the factors that influence villagers' participation in forest restoration. Biodiversity recovery and carbon accumulation exceeded expectations. Villagers appreciated improved water security and a better relationship with the park authority. However, problems have recently arisen, due to increased population and a breakdown in fire-prevention measures.

Since 2015, the Thai community of Ban Pongkrai, also embraced the framework species method to restore the watershed above their village. FORRU-CMU provided technical support, with funding from the Aura Water Company, whose bottling plant depends on the catchment to recharge their aquifer, so a PES approach was followed. The community cut payments for their labour in favour of funding of a community nursery, to sell trees to the project in the future. This project benefited from the maturity of the practical restoration techniques, previously developed and novel methods of social engagement.

### The Effectiveness of Local Institution in Managing Private and Common Forests in Indonesia

Suharjito D. (Department of Forest Management, Faculty of Forestry-Bogor Agricultural University), Ohorella S., Krey DLY, Mulyono MMB, Hamzah, Oktoyoki H, Ichwandi I, Istomo, Kusdamayanti, Agung SS, Saharuddin (Bogor Agricultural University).  
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Debate over the role of local institution in ensuring forest resources sustainability are still interesting to be discussed. Some researchers have explained how local institutions are important in which some groups or communities manage effectively their forests (see e.g. Ostrom 1990; Berkes 1989; Gibson et.al. 2000; Agrawal 2000). Local communities (forest user groups) have capacities to create rules of access to and use of forest resources that significantly affect forest condition. However, some researchers have criticized the praising of the traditional institution capacity on local communities, but actually there are heterogeneity within local communities interm of dependence level on natural resources, their interests, knowledge and information dissemination; lack of trust and accountability (e.g. Thondhala et.al. 2015). Local communities have shown institutional diversity with their contextual functions (e.g. Andersson et.al. 2014; Lambini and Nguyen 2014).

This paper presents the influence of local institution to private and common forests

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performance with cases of the effectiveness of local institution in managing forest in Indonesia covering Eastern Indonesia (i.e. Papua and Moluccas), Middle Indonesia (i.e. Kalimantan), and Western Indonesia (i.e. Sumatera). The effectiveness of local institution refers to, firstly the role of institution in preventing negative actions such as illegal logging, forcing adherence of community members to the norm and rule, enforcing punishment. Secondly, it refers to performance of forest resources. Forest performance refers to biophysical forest conditions.

The paper shows the role played by a variety of local community institutions to control and use forest resources. The communities develop social value, norms, rules, and organizational structure for managing natural resources. The land based-natural resources have been classified in terms of property rights i.e. common and private rights, and their functions i.e. production, protection, and conservation. The property rights are related to kinship system. The traditional social organizations arrange utilization and protection of forest resources in accordance with rules they themselves craft and enforce. The cases have shown that the biophysical forest conditions are in good performance shown by important value index and abundance of plant species.

### **Alternative Livelihood Dilemma and Degradation Park: Contested of Power to Struggle Social-Economy-Ecological Interest in Gede Pangrango National Park**

Deni (Departemen of Forestry, Kuningan University), Soeryo, A., Arif, S., Kartodiharjo, H.,  
(Bogor Agricultural University)

Forest degradation has occurred in Indonesia conservation areas including Gede Pangrango National Park. Forest degradation is marked incidence of illegal logging and the land occupation by local communities. Some national parks approach alternative livelihoods to reduce land occupation. But the results are less satisfactory.

The study used qualitative methods to answer three things: 1) how social formations that made forest degradation? 2) Why alternative livelihood development did not succeed to reduce forest degradation? 3) What power strength which made the local people prefer land occupation?. The study was conducted in Gede Pangrango National Park with the focus of the study to observe the process of power contestation, the development of alternative livelihoods and forest degradation in Sukatani village.

The results reveal that the occupation of land and forest degradation caused by power relations. Local communities build power relations to maintain access rights. Farmers are not serious for alternative livelihoods and prefer the land occupation as a rational action. Ties of patronage at the farm level made small farmers continue to maintain land occupation. on the other hand, market power and high economic value of agriculture has made forest fails to be restored.

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## Macadamia Dominated Forest Cover Increases Instream Sediment and Soluble Phosphorus in the Lower Wilsons River Catchment, Subtropical Australia

Salminah, M. (Research Center for Social Economy, Policy, and Climate Change, Ministry of Environment and Forestry of Indonesia, Forest Research Centre, School of Environment, Science and Engineering, Southern Cross University, New South Wales, Australia ), Nichols, D. (Forest Research Centre, School of Environment, Science and Engineering, Southern Cross University, New South Wales, Australia), Mutaqqien, M.Z. (Research Center for Social Economy, Policy, and Climate Change, Ministry of Environment and Forestry of Indonesia)

Impacts of various densities of forest cover dominated by macadamia plantation on sediment and soluble phosphorus were investigated with regard to different precipitation and temperature during wet and dry seasons over six years (2003 – 2008) using regression analysis of the Generalized Estimating Equation. The study indicated that there was significant relationship between forest cover and instream sediment and soluble phosphorus. The coefficient regression confirmed that a unit increase in closed forest cover would increase suspended sediment by 19.6%, while a unit increase in open forest cover would decrease suspended sediment by 12.89% during dry seasons. The changes of macadamia dominated forest cover, both open and closed cover, did not significantly affected suspended sediment during wet seasons. Moreover, a unit increase in open forest cover would decrease soluble phosphorus about 4.78% while a unit increase in closed forest would increase it by 11.74% during wet seasons. During dry seasons, an increase in soluble phosphorus level was only determined by the change of macadamia dominated closed forest cover. This study presents understanding that forests could diminish water quality if they are managed inappropriately. Vegetation structure and the forest management system would influence the role of forests in protecting water quality. Monoculture macadamia plantation forests could lead to an increase in stream sediment and phosphorus due to high fertilizer use and bare forest floor. Consequently, NSW Government should consider expansion systems of macadamia plantation forests in NSW, contributing more than 50% of Australia's total macadamias, to balance economic development and environment quality. Buffer zone, peripheral to a macadamia forest plantation would be an advantageous approach in order to reduce negative impacts of vegetation structure and forest management system on water quality.

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Sub Themes:

## **Session 2.6. The Societal Dimension of the Forest Based Bioeconomy – Participation, Sustainability and Justice in Natural Resource Governance**

Chairperson(s): Irmeli Mustalahti (Institute for Natural Resources, Environment and Society (LYY), University of Eastern Finland)

### **How Do European Forest Actors Perceive Bioeconomy? Implications for Forest Policymaking**

Giurca, A. and Kleinschmit, D. (Chair of Forest and Environmental Policy, University of Freiburg)

Bioeconomy is one among recent emerging macro-political concepts defining entire science and technology policies in Western countries and beyond (Godin, 2006, Goven and Pavone, 2015). Although its meaning is still in a flux, scholars and policy makers broadly understand bioeconomy as the transition from a fossil fuel-based economy to a renewable bio-based economy (McCormick and Kautto, 2013). A big part of these bio-based resources will most likely originate from forests (e.g., round timber, pulpwood and other forest residues) (Scarlat et al., 2015). Thus, the forest sector is in the spotlight of the bioeconomy, as one of the main provider of biomass.

The evolution of the forest-based bioeconomy appears so far mainly at a strategic and conceptual level, with governmental publications and scholarly literature either focusing on the different technical or management pathways for achieving bioeconomy, or focusing on the consequences of such a transition (Golembiewski et al., 2015). However, some researchers have already voiced concerns that social aspects are neglected and key stakeholders are left out of the discussion (Ollikainen, 2014). Insights into how bioeconomy materialises as a driving force in forest policy and management in Europe is still missing. Thus, a first important step for addressing this knowledge gap is to scrutinise the perceptions of bioeconomy by relevant forest stakeholders (Hodge, 2016). Considering that any meaningful transition towards bioeconomy will have to involve all concerned stakeholders (Kleinschmit et al., 2014), the main aim of this paper is to understand how actors from the European forest sector perceive the bioeconomy concept and how they articulate the role of forests within bioeconomy.

This study is part of a PhD project titled: *Transitioning to a forest-bioeconomy? Actor networks and coalitions along emerging wood value chains in Germany and Scandinavia*. A number of different theoretical approaches and empirical studies will be presented. Empirically, these studies build on qualitative document analysis, in-depth qualitative interviews with relevant forest stakeholders, as well as quantitative social network analysis. The analytical framework currently under development includes a number of different theoretical and conceptual approaches such as: discourse analysis (Hajer, 1995), technological transitions (Geels, 2002), social capital (Coleman, 1988) as well as intuitional approach (Lawrence and Suddaby, 2006). Generally, the study departs from the assumption that influential concepts in policymaking are not merely neutral or

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scientific, but instead represent complex interests, ideologies, and power that have the potential to shape the ways certain issues are framed and include or ignore certain actors (Molle, 2008, Shore and Wright, 1997). Finally, the opportunities and pitfalls of the study's approach will be discussed.

### **Responsive Bioeconomy: Learning From Interaction of States, Citizens and Forestry Sector in Forest Based Bioeconomy**

Mustalahti, I. (Institute for Natural Resources, Environment and Society (LYY), University of Eastern Finland)

Europa concerned with climate change, the bioeconomy will challenge previous conceptualizations about how states, citizens and corporations interact in everyday practices of natural resources governance. As an example of this, the paper aims to discuss the conceptual understanding of responsive governance of forest based bioeconomy in Finland. In this paper, I aim to understand how the concept relates to aspects of citizens' participation and justice in natural resource governance, taking the example of a forest-based bioeconomy. The crucial question is in how far economic development and transition as envisaged under the bioeconomy concept can be aligned with responsive governance, and how the concept relates to participation of (local) citizens in forest governance, and social justice. The main objective of this paper is to create theoretical understanding of responsive governance between macro and micro levels of administration, local citizens, civil society and private sector. This paper opens up a new field of responsive bioeconomy in context of Finland and it allows for both conceptual and contextual understanding which can be used to refine and test responsive governance of bioeconomy in other countries. Methodically, a multi-level analysis of visions and strategies relating to the Finnish forest based bioeconomy will be done via discourse analysis. The methods will combine textual analysis of policy documents and written material from a diverse set of actors ranging from the government to economic interest groups, civil society actors and scholars. This paper argues that citizens could have skills and ability to effectively participate in the decisions on matters that directly affect their lives. However, in case of forest based bioeconomy, it is particularly important in an interactive administration to provide information as well as possibilities to discuss the alternative solutions and a variety of perspectives. Environmentally and socially sustainable forest based bioeconomy requires decision-makers, citizens and forestry sector to have the ability and the will for the responsive approach.

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## Property Right Evolution on Mangrove Management with No Land Emerged in Pesawaran Regency Lampung Province—A Case from Indonesia

Kustanti, A. (Forestry Department, Faculty of Agriculture, University of Lampung, Indonesia)

Characteristics of mangrove forests that grow without directly to the ocean in Pesawaran Regency had safer environmental conditions. That forest was namely Kahayan. The interest on mangrove utilization by people affected the mangrove sustainability. This research purpose was to know how the property right evolution on mangrove management involved on mangrove sustainability. The method used snowball sampling and Institutional Analysis Development/IAD (Ostrom, 1999). The result showed that mangrove forest on 1977-1980 was open access with bundles of right as access & withdrawal, management, and exclusion right, by 1980-1990 was private forest as traditional shrimp farm. Mangrove management on 1990 had more attention from the government and people. It related the environmental function as abrasion barrier and source of living. By year 1995-2005 the management of mangrove started exertion to modern scale of farm shrimp. And by 2005-2011 many ponds of shrimp exerted by the private corporation until now with the bundles of rights as access & withdrawal, management, exclusion right, and tradable right. The bundles of rights in this site was different compared to mangrove forest in East Lampung Regency (Kustanti et al, 2014<sup>a,b</sup> and 2015). Transfer of right was done by give to University of Lampung with bundles of rights as access & withdrawal, management, and exclusion right.

## The Societal Dimension of the Forest Based Bioeconomy – Participation, Sustainability and Justice in Natural Resource Governance

Robinson, N.A. (Elisabeth Haub School of Law at Pace University, New York, USA),  
Paloniitty, T. (University of Helsinki, Finland)

The wetlands law and policy of two jurisdictions—the New York/USA and Finland/EU—are scrutinied here, in a compaarative study of frameworks through which legal systems either foster or obstruct public participation in the decision-making over wetland resources. The paper consists of three parts: 1) scientific summary of the benefits of wetlands to the communities dependent of them, 2) description of both legal systems and especially the participatory aspects the systems provide, and 3) analysis of both systems in order to identify elements which might bring positive benefits for public participation in wetlands regimes generally, and in particular for the Indonesian wetlands regime.

This comparative analysis examines the roles of public participation in wetlands governance, thorough adaptive socio-ecolegal management. It applies Principle 10 for the Rio Declaration on Environment & Development, and other general principles of law mandating effective public participation to the circumstances of wetlands.

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The wetlands governance in EU is examined in the jurisdiction of Finland, which actively exploits its wetlands for energy production purposes and has a long history of publicly debating it at the general and individual undertaking's level. The EU Water Framework Directive (employing adaptive water management to Union waters) is implemented in the country, playing a leading role in the governance system since the hydrological cycle causes the holistic water management turn to waters-and-wetlands management. The CJEU's strict stance in the *Weser Case* (C-461/13) on the legal normativity of the WFD's environmental objectives prompts a need to examine the compatibility of legal rules with adaptive management. It is found that even though participatory rights in the WFD meet only the most rudimentary needs of deliberative natural resources governance, strict legal normativity combined with effective enforcement can bring ecologically reasonable results even when the decision-making is not exceptionally deliberative.

While freshwater wetlands provide ecological services in the USA are comparable to those Europe, the legal regimes vary. New York has one of the most advance regimes (Article 24, Environmental Conservation Law), its effectiveness can be contrasted with the more problematic federal wetlands laws (Section 404 of the Clean Water Act). Both provide robust public participation procedures, but these work more smoothly where the wetlands laws itself is substantively clearer and better observed, as in New York. The relationship of these wetlands laws to local land use regulations will be explained, and how the regimes function in rural or "wild" (pristine) wetlands similar ot Finland will be constricted with suburban and urban wetland settings.

Analysis of possible "roadmaps" for effective wetlands governance should give due attention to the following:

- a. Sustainable wetlands governance needs to encompass the implications of the overall legal system, incl. water regulation,
- b. Clear legal norms, which can transparently be applied to wetlands, are essential and require consistent and diligent enforcement (and in comparison with the public opinion), and
- c. Public participatory rights are fundamentally important, but when not effectively observed are at constant risk of turning into quasi-justification for top-down decision-making and thus are not a substitute for deliberative natural resources management.

## CO-MANAGEMENT, FOREST PRODUCTS AND SMALLHOLDERS

Sub Themes:

### **Session 3.1. Empirical and Theoretical Insights from Community-Based Policy Approaches**

Chairperson(s): Ahmad Maryudi (University of Gadjah Mada) and Arya H. Darmawan (Bogor Agricultural University)

#### **By Whose Rules, For Whose Needs? Power of Elites, Livelihood Implications and Resistance in Nepalese Community Forest User Groups**

Harrer, C. (Erasmus Mundus MSc student in Sustainable Forest and Nature Management (SUFONAMA), Swedish University of Agricultural Sciences and University of Copenhagen)

The Nepalese community forestry program entitles user groups to autonomously manage their forest within the confines of an officially approved operational plan. While widely considered a conservation success, recent discourses on elite capture, professionalization and recentralization challenge the program's anticipated social outcomes. This article bridges and exemplifies these discourses by exploring power relationships between forest users, executive committees and forest administration as associated with livelihood impacts and resistance. Findings are based on qualitative interview studies in two forest user groups.

Results indicate that operational plans have little practical relevance for forest use. While access for subsistence purposes is largely unlimited, timber is restricted by forestry officials colluding with local elites to the detriment of those in need. Nevertheless, prevailing tacit acceptance of traditional and techno-bureaucratic authority allows this coalition to monopolize control over communication, decision-making and resources, and to silence criticism. Resistance however manifests itself in a legal complaint and increasing resentment.

In conclusion, this study highlights how stakeholders' access to forest resources and decision-making rests upon unequal power rather than formal rights. A precondition for change is for a majority to challenge inequality. I therefore suggest that locally emerging resistance could be catalysed into empowerment by independent external actors.

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## Legalization and Local Management of Customary Forests in Jambi, Indonesia

Sakata, Y., Harada, K. (Graduate School of Bio-agricultural Science, Nagoya University)

Customary forests (CFs) in Indonesia have been legally regarded as state forests and Indonesian government has not recognized property rights on CFs, but the local government in Kerinci, Jambi has recognized CFs by giving decrees for more than 20 years. While ministerial regulation in 2015 decided to exclude CFs from state forests and gave property rights to local communities, the case of CFs in Kerinci may be the first case to be recognized nationally beyond local recognition. Thus this study investigates 1) how the CFs are managed, 2) how local people engage in CF management and 3) how the local government recognized the CFs. Through interviews to local people, we found that since the establishment of the Kerinci Seblat National Park, the local government has been willing to conserve forests and recognize CFs. NGOs also played crucial roles to enhance CF's recognition by supporting CF management. The local people's dependence on water supply from the CFs raised people's awareness about conserving the CFs. Additionally, local communities set rules to keep the CFs healthy, and to share their interest of saving forests with the local government. In conclusion, local government and NGOs played an important role for CF management.

## Implications for Formalizing Small-Scale Timber Operators for Employment and Revenues: Lessons from Indonesia

Dermawan, Ahmad (CIFOR)

The enactment of the timber legality verification systems in Indonesia, known as *Sistem Verifikasi Legalitas Kayu* (SVLK), provides some opportunities and challenges in the context of seeing SVLK as a formalization process. One of the challenges is to deal with the vast amount of smallholders and small operators. The paper attempts to assess the implications of SVLK certification for small operators in terms of government revenues and employment. Using secondary data, the paper analyses the government revenues from land and business registration and income taxes, the revenues for the small-scale companies and the workers, and compare them with the potential amount of government subsidy for first-time certification. The paper finds that while the government could have to provide a significant amount of money to provide subsidies for first-time certification, the potential revenues from taxes could offset the subsidy spending. For workers, SVLK could mean increasing their wages to the minimum wage level. For companies, SVLK certification is an additional cost that does not necessarily translate into increased revenues.

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## How Rural Elite Capture Affects Vulnerability a Case Study of Y Village Of Hebei Province

Shi, W, Long, H, Liu, J. (Renmin University of China School of Agriculture and Rural Development)

The survey on the Y village in the forest zone of Hebei Province demonstrated that rural elites capture resources and money from "Project System", such as Ecological migration project, Agricultural comprehensive development industrial operation projects, and land management items. The rural elites build and manage a team which was connected by kinship and interests by social networks and their own capital. They strengthen the "legitimacy" of their management by "moral bank", "fragmented management", and "cultural indoctrination". Unlike the traditional model of elite capture which pursued monetary resources from project system, they grabbed the land from the farmers to cheat more resources from the government, occupied various development opportunities and controlled the village, which would increase the vulnerability of households and lead to violent clashes in the climate change and economic risks.

## Interests of Forest Bureaucrats in Community Forest Management Plan Revision in the Western Hills of Nepal

Basnyat, B. (Institute of Forestry, Tribhuvan University, University of Copenhagen), Pokharel, R. (Tribhuvan University, Kathmandu-Nepal), Treue, T. (University of Copenhagen), Lamsal, L.N. (District Forest Office) and Rayamajhi, S. (Institute of Forestry, Tribhuvan University)

In Nepal, forest management plans, endorsed by district forest offices, form the legal basis for community forest user groups' perpetual and exclusive forest rights. However, the forest bureaucracy uses inbuilt, but *not* legally required, expiry dates of such plans to its political and economic advantage. Based on a rapid survey of seventy-six forest user groups, thirty amended management plans, stakeholder consultations, and intensive interactions with six forest user groups whose plans were amended last year, two different arrangements to plan revision were identified, which include exclusively by forest officials and contracting out. Funds were received from government, donors or community. None of the approaches complied with prescribed processes and often biophysical data were manipulated to comply with official requirements. Consequently, all revised plans were almost identical to their previous versions and modifications mostly the result of desk exercises. The study concludes that the forest bureaucracy uses plan revisions to reinforce official and un-official rules that strengthen or re-establish its control over harvesting and marketing of forest products, while pretending to meet donors' interests of sustainable forestry. Furthermore, forest bureaucrats generated official and unofficial incomes through allowances and logistical support from the government, service providers, donors and forest user groups.

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## Promoting Non Timber Forest Product to Alleviate Poverty in Kerinci Seblat National Park Buffer Zone South Sumatera: A Reflection on Market and Policy Challenges

Muslimin, B., Sidiq, M., and Haasler, B. (University of Muhammadiyah Palembang and GIZ, Bioclime)

People believed national park forest can provide a variety of Non Timber Forest Products (NTFPs). In Karang Panggung Village, Musi Rawas District South Sumatera, about 80% people live to maintain their land for planting the coffee plants symbioses with buffer zone forest of Kerinci Seblat National Park. The study highlights challenges that local people and Forest Management Unit (FMU) seek to develop possible future management models that provide "win-win" outcomes, where livelihood improvement is matched with the advantages of sustainable management of high biodiversity conservation value forest, and suggest a policy framework which can attain it. The methodology of this research is qualitative, to collecting data using interview with snowball technique. Data analysis using Market Analysis Development, Internal Factor Evaluation (IFE) Matrix and External Factor Evaluation (EFE) Matrix. The study indicates that many actors have key roles to play in assisting local people with production and marketing chains, as well as integrating community needs and rights into forest ecosystem management concepts. Results showed that, market behaviour created semi-strong efficient market hypothesis and oligopsony, selling through intermediaries become of distribution channel choice. The study recommended policy to create market efficiency behaviour by distribution channel.

## Mangrove Contributions in Supporting the Development of Small Island, a Case of Tanakeke Island, Takalar, South Sulawesi

Setiawan, H. (Research and Development of Environment and Forestry Institute of Makassar)

Small island ecosystems as part of marine resources have become a global issue that is characterized by the inclusion of the issue of "Live below water" in global development agreement named SDGs/Sustainable Development Goals. Indonesia has also committed to preserving marine with inclusion of preservation of coastal ecosystems in national priority development program called "Maritime and Marine". Mangrove ecosystem as part of the coastal ecosystem has a very significant role in supporting the life of coastal communities, particularly in the field of ecology and economics. This study aims to assess the contribution of mangrove ecosystems in supporting the regional development of coastal areas especially at small islands. The study was conducted on the Tanakeke Island, Takalar Regency, South Sulawesi Province. The method used is a qualitative method. The data collection was conducted by observation, depth interview, and literature review. In-depth interviews with key respondents were selected using purposive sampling technique. Observation techniques performed to determine the condition of the mangrove ecosystem on the Tanakeke Island and various community activities in utilizing the mangrove. The data were analysed descriptively qualitative, with the stages of data tabulation, data reduction, data presentation, and then drawing

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conclusions. Results showed direct contributions of the mangrove ecosystems to communities at Tanakeke Island are as a producer of charcoal and firewood, piles of seaweed, mangrove nurseries for rehabilitation project and used as materials for “Paropo” as one of the traditional fishing methods. Contributions mangrove indirectly for the people of Tanakeke Island are the catchment area for the commodity of shrimp and crab, the protective embankment and the settlement from sea tide, resulting in sedimentation and deltaber (*aanslibbing*), control the sea water intrusion, protect the island from erosion due to tidal waves and windstorm.

### **Bamboo Industrial Plantation Forest: Challenges and Opportunities for Indonesia**

Yuniati, D. and Khotimah, H. (Forest Research and Development, FORDA Ministry of Environment and Forestry-Indonesia)

The issue about industrial plantation forest of bamboo is new for Indonesia. This concept is expected to make sufficient supply for the growing bamboo-based industrialization process in Indonesia. The paper purposes to study opportunities and challenges for Indonesia in establishing bamboo industrial plantation forest with qualitative analysis method. The biggest opportunity is that there is new emerging market for bamboo-based industrialization products as wood substitute such as laminated bamboo products, rayon & textile, pulp & paper, and biomass energy, beside the traditional market such as handicrafts, bamboo shoots, chopstick and traditional bamboo furniture. Some national industries have started to invest such as strand woven laminated bamboo in Bali and textile manufacturing in Bandung. The other opportunities are the abundant of bamboo resources, land availability such as state forests and critical land, and regulations have already allowed legally. In other side, the challenges come from the readiness of national system to establish bamboo industrial plantation, such as the limitation of: (1) bamboo seedling in large scale, (2) experience in bamboo plantation, it causes (3) limited quantitative research data, and (4) according the dilemma of which establish first between bamboo plantation and bamboo manufacturing causes doubts of investor to enter the industry.

### **Analysis of Value Adding On Bamboo Products in Kintamani Sub-District, Bali: A Study Case in Hidup Rukun Farmer Group**

Ekawati, D. (Center for Socio Economic Policy and Climate Change Research and Development, Ministry of Environment and Forestry) and Sugiyanto, K. (Center for Forest Products Research and Development, Ministry of Environment and Forestry)

Bamboo is one of the important non timber forest product commodities in Indonesia. Bali is a unique center where bamboo grows and utilized traditionally, such as found in Kintamani, Bangli Regency. This paper analyses the local bamboo plantation and its utilization and recommending the possible value added improvement. The study was conducted using participatory survey in *Hidup Rukun* farmer group at Kintamani from 2014 to 2016. Results show that currently bamboo is planted traditionally and farmers

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sell raw bamboo stem, which is less in value. Bamboo is used for floating fish cages, agricultural plant stakes and scaffolding locally, and sold to other districts for handycraft and other woven products. It is then recommended to improve the value added of bamboo locally. It is also recommended to expand the plantation of commercial bamboo species using good quality planting materials. In terms of value added, bamboo incense stick could be one of home based industry which may be developed to improve local business. Capacity building of farmer group is also one important action to enhance their capacity on value adding process and establish smallholder business enterprises. Official support from the local government becomes important key in developing bamboo commodities in Kintamani Sub-District.

**Sub-Theme:**

### **Session 3.2. International Forest Governance and Its Domestic Influences**

Chairperson(s): Lukas Giessen (University of Goettingen)

#### **Downstream Areas as an Entry Point for International Watershed Regimes in Indonesia**

Sahide, M.A.K (Hasanuddin University), Maryudi, A. (Gadjah Mada University), and Giessen, L. (University of Goettingen)

Watersheds can produce different costs and benefits to those living in upper, middle, and downstream areas. The area categorization is not only based on ecological consideration, but may also be a political issue. Such becomes more complex with the influence of some international environmental policies, which meet domestic politics performed by local fragmented bureaucratic politics and their institutions. Those actors and institutions can be synergistic, overlapped or conflicted each other. This paper aims (1) to analyse if international watershed regimes address at up, middle, or downstream areas or the whole watershed as such, and (2) to analyse the bureaucratic responsibility for the regimes and watershed categories. The empirical methods include content analysis of Indonesian newspapers, national expert journals, organizational position papers, and selected interviews. We used interest and bureaucratic politics power theory for analysing watershed regimes and its eco-spatial politics. We identified six main international regimes are relevant for watershed regime complex in Indonesia, namely payment of environmental services, sustainable development framework, loan on water resources management, agricultural and food policy, and climate change initiatives. International loan on water management is the strongest regimes that influence policy and policy making in Indonesia. Water management project supported loan regime is exists at downstream area. Other regimes are formally serving the whole part of watershed but tend to depend on or steered by the actors' interest at downstream area, they are mostly subsist as non-legally binding and influence domestic policies through international norms and direct access by international organizations. International watershed regimes preferable address downstream areas due to a) high concentration of population, and b) high concentration of economic activities and business allocated there.

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Land use bureaucracies is the most relevant institutions that responsible for regimes that survives at upstream areas, whether public works, finance and local bureaucracies are the core bureaucracies responsible for regimes which exist in the downstream areas. Downstream areas, potentially leading to conflicts among international actors and national bureaucracies as well as among national (and sub national) bureaucracies become more fragmented.

### **Where The Action Is. Exploring The Public's Dynamic Relationship to Forestry in Germany.**

Bethmann, S. (Forest Research Institute Baden-Wuerttemberg (FVA Freiburg)).  
stephanie.bethmann@forst.bwl.de

In recent years, forestry practitioners and politicians throughout Europe have shown an increased interest in social scientific contributions to understanding citizens' expectations of forest management, especially where conflicts between civil society groups and forestry administrations or forest owners have occurred. Several surveys have been initiated to monitor how people perceive and use forests, and what opinion they hold on forestry. But public opinion is a dynamic phenomenon that changes and alters and is, to some degree, a matter of communication and interaction between citizens, stakeholders, and forestry professionals. To get a better grasp of such dynamics, the study *sociocultural forest monitoring*, conducted by the Forest Research Institute Baden-Wuerttemberg in Germany, puts together a number of methods imported from various social science disciplines that are designed for analyzing dynamic processes and social practices *in actu*: participant observation, group discussions, narrative interviews, and the go along method. The paper presents first results, focusing on communication structures and their effect on public opinion formation. It is argued that fostering methodological variety in forestry research enriches the existing body of knowledge by shifting focus to where the action is: from static opinion to driving forces in communication, conflict, and civic engagement.

### **Landscape Transformation in Jambi Province Sumatra – An Analysis of Land Tenure Regulations under Translational Dynamics.**

Kunz, Y (Georg-August-University Goettingen/ Watch Indonesia!). ykunz@gwdg.de

Indonesia has attracted increasing global attention in recent years due to concerns over large-scale deforestation. The island of Sumatra in particular is severely affected by the rapid expansion of monoculture cash crops. Since Dutch colonial times, land tenure regulations here have generally favoured such resource exploitation. The current National Development Plan, impacted by international demands and policies, continues to see Sumatra as a centre of production in order to eradicate poverty and accelerate national development. This developmental focus, however, is accompanied by contested land use scenarios, often caused by overlapping layers of land tenure regulations. Taking a historical perspective, this research discloses different layers of past and present land tenure regulations to understand present contestations of land use, resource exploitation,

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and their social consequences. Processes to formalize rights over land have been implemented with the intention of abolishing this overlap, aiming at reducing deforestation. This study analyzes the consequences of formalization processes on de facto local level patterns of land tenure regulations. Using empirical material from 11 villages in Jambi province, Sumatra, results show that state-led land reforms and formalization processes are imitated and translated on the village level. We refer to these translation processes as “mimicry of the legal”. The land reform endeavours fostering mimicry of the legal in turn allow for resource exploitation and rent-seeking behaviour.

### **Creating both Conflicts and Solutions between Customary and Legislative Regulation – Case of China**

Jiayun, D. (Fujian Agriculture and Forestry University), Jinlong, L. (Renmin University of China), Weiping, L. (Fujian Agriculture and Forestry University)

China kicked off newly collective forest tenure reform since 2003, promoting the clarity of forest-related properties and flexibility of management. However, many conflicts about collective forest tenure sprung up, severely hindering the reform and social stability. Through analyzing a conflict about the transfer of collective forestland, the paper found that farmers engaging in conflicts not only needed to face the risk of being identifying as mass disturbances and racketeering but also needed to handle the relationships with the people having a close interest connection. The farmers chose to exert influence on local governments through continually appeals and petitions. The local governments were paradoxical because they were sympathy for farmers’ experiences and acknowledged the legality of transfer, as a result, the local government played a role of coordinator rather than arbitrator. When forestry investors found the local governments’ rocking attitude, the social powers closely connecting with farmers was brought in, and local governments may take a hands-off attitude in order to end the conflicts as soon as possible. As a result, compromise was forced to be reached and the conflict was resolved. While China was transforming from the traditional rule of rite to modern rule of laws, the development and solution of collective conflicts of forest tenure often accompanies with the integration between formal and informal institutions, legislation and custom.

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Sub-theme:

### **Session 3.3. Social and Institutional Approaches to Study Forest Management and Livelihoods**

Chairperson(s): James Erbaugh (University of Michigan)

#### **Structural Analysis for Farmer's Post Adoption Decision on the Farm Forestry Policy based Candlenut Agroforestry of Central Sulawesi, Indonesia**

Umar S. (Tadulako University), Alam, Andi S., Ningsi, Sri M., Wahid, A.

The study aims to describe the structural model for farmer's post adoption decision on the farm forestry policy based candlenut agroforestry. It involved exogenous variables (X1= number of candlenut trees, X2= number of cocoa trees, X3= candlenut production, X4= cocoa production) that affect directly farmer's satisfaction (Y1= satisfaction toward income from the agroforestry and Y2= satisfaction toward agroforestry inheritance) and post adoption (Z= agroforestry post-adoption). We employed Path Analysis to provide the estimates of the magnitude and significance of hypothesised causal connection between the variables. The target population in this research includes all farmers of the agroforestry in Sigimpu and Bakubakulu villages, Palolo sub district, Sigi District, Central Sulawesi Province of Indonesia (315 farmers) out of which a number of 164 farmers were selected by using Isaac and Michael Table. The path model shows direct effect of Y1 and Y2 and indirect effect of X1, X2, X3, X4 on Z through Y1 and Y2. The magnitude of the direct effects to post-adoption are 48.8% and the total effects are 66.5%. The Y2 contribution is greater than Y1, while X1 indirect effect is the biggest of exogenous variables. F and t tests show significantly effects of Y1 and Y2 on Z.

#### **Can Securing Land Tenure Improve Livelihood and Ecosystems Services: Case Study of Community Forestry Based In Indonesia**

Suyanto, S., Khususiyah, N., Galudra, G. and Rahayu, S. (World Agroforestry Centre /ICRAF)

It is widely belief that securing land tenure is a prerequisite for farmers to invest on land management such as tree planting, improving agriculture technique, and soil conservation and resulting on increasing of land productivity. At the end, farmers will get higher economic benefits. This study quantified the impact of securing land tenure through Community Forestry (HKm) on farmers' income, tree diversity and carbon sequestration. The study site is protected forest of Sesaot in West Lombok District, East Nusa Tenggara Province. The area has been degraded and converted to other land use systems such as agriculture and agro-forestry "illegally" by farmers. In response to this problem, district government proposed to give permit to farmers for cultivating the land with conditionally, the mechanism called "*Hutan Kemasyarakatan (HKm)*". Under HKM

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scheme, farmers must practice agro-forestry system through integrating tree species, perennial crop and annual crop that can provide both ecological and economical function. This study found scientific argument that securing land right through community forestry (HKM) will increase farmer's welfare as well as environment.

### **Assessing, Analyzing, and Visualizing Content Change in Indonesian Forest Policy, 2000 to 2015**

Erbaugh, J.T. (University of Michigan)

This study provides an assessment of how Indonesian forest-related policy has changed from 2000 to 2015. Forest governance is guided by policy content that determines definitions, mode of rule enforcement, and how benefits are received and distributed from forests. However, forest-related policy is not static, it changes over time. Studying how and when forest-related policy changes provides insight into how forest governance reflects national political projects, including decentralization, natural resource extraction, and international cooperation. To assess the tempo and directionality of forest-related policy change in Indonesia, we identify and code national laws and rules (*Undang-Undang* and *Peraturan Pemerintah*), Presidential Decrees (*Peraturan Presiden* and *Instruksi Presiden*) as well as Minister of Forestry Decrees (*Keputusan Menteri*) that define, modify, or delineate enforcement strategies for Indonesian forest areas. These coded documents are analyzed across three time periods to determine the tempo and directionality of Indonesian forest-related policy change. By examining the tempo and directionality of forest-related policy change, this study contributes information on when, how, and through what documents nationally significant forest-related policy has shifted since Indonesia's turn toward democracy. Further, this study provides a novel method of policy-content visualization, using network analysis, to determine how policy content that affects Indonesian forests is connected over time to impact national forest agendas.

### **Principal Agent in Tree Mortgage System on Traditional Agroforestry Management in Moluccas Indonesia**

Salampessy ML, (Forestry Faculty Nusa Bangsa University, Indonesia), Febryano IG (Forestry Studies of Agriculture Faculty Lampung University, Indonesia) and Sinurat J (Economy Faculty Nusa Bangsa University Bogor, Indonesia)

The agroforestry system in land management has been carried out traditionally by the societies in Moluccas. The practice is known as "Dusung", where one of the types of the plant which is cultivated is nutmeg. Farmers face a number of problems, one of which is a system of debt bondage that is extremely inflicted a loss upon the farmers. This study aims to explain the involvement of farmers with debt bondage system, namely the tree mortgage system. The method used is a case study, where data collection conducted interviews and participant observation. The data analyzed using principal agent theory. The results showed that nutmeg farmers (principal) have a risk of debt bondage (agent)

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denied an agreement/moral hazard or act out an agreement. This occurs when agent exploiting the excess of information and nutmeg marketing prospects, which makes the position of farmers weak and disadvantaged.

### **The end of the last hunter-gatherers in Kalimantan: analysis of changes in forest areas and the transformation of livelihoods system**

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Forest for hunter-gatherer communities is not only an asset but something much more ingrained in the culture, history and livelihoods of these peoples. We take departure in Weber's theory and examine changes in rationality in relation current versus past economic systems to analyze the transformation of community livelihood systems. The Dayak Punan tribe is experiencing rapid changes in their livelihood system as forest access is increasingly limited and the nature of interaction with the surrounding society rapidly changes. Based on a case study of five Dayak Punan communities in Berau District, East Kalimantan using both qualitative and quantitative methods we document this transition. Resettlement forced by the government, expansion of large-scale extractive economic activities in the forest areas and NGO community empowerment program serves as driving factors that shifts forest income dominated income portfolios towards new and more diversified livelihood strategies. The transformation of livelihoods is not only providing the opportunity for overall increased welfare but also changes power structures as the basis of egalitarian group in hunter-gatherer communities are replaced by more formal and structured new institutions, that provide an opportunity for a small portion of community members to profit while the majority struggle to preserve their life.

### **Participatory Village Land Use Planning (PLUP) in Papua, Indonesia: Challenges and Opportunities**

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Understanding local wisdom in land management is one of the key towards sustainable development in rural area of Papua, Indonesia. This is important in to overcome conflicting interests over land uses in, where development plan were met with traditional culture. In this area, more than often failure to understand local perception over land use, leads to horizontal conflict that were difficult to resolve. We worked with the communities in Papua, the Wambena Village in Jayapura and the Zanegi Village in

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Merauke, to develop participatory land use plan at village level. Together, we conducted a participatory processes consisted of three systematic steps: inventory of traditional land use management system, discussion of common vision toward the future and development of village land use plan. The results showed that although the two communities practiced different system of land management, both village shared a common vision on sustainable use of land. The land use plan produced based on those vision were then used to connect the community land use vision with formal development agenda. The processes has been recognized and endorsed by local government in two districts and can be used as one of the way to incorporate local wisdom into land use planning.

### **The Urgency of Increasing Private Forest Farmers' Capacity Building towards the Increase of Their Livelihood: Lessons from Indonesia**

Sumirat, B, Wakka, A.K., HB, A. Rizal, Hayat, Nurhaedah N, Purwanti, R. (Environment and Forestry Research and Development Institute of Makassar, Ministry of Environment and Forestry of Indonesia)

Private forest farmers have the significant role in CBCF (community based commercial forestry). Farmers used to manage their farms without adequate knowledge on how to manage their forest better. The revenue of that model of farm management have been alleged, they have not received a proper and fair revenue. Under such condition, it is questionable of farmers' land productivity, i.e. the quality of wood production and the revenue from their forests. However, the circumstance showed the evidence that private forest farmers who have the greatest contribution gained the smallest margin. This study is introducing an understanding of new paradigm in managing farmers' farm, i.e. MTG (Master Tree Grower) approach. The results showed that the approach provided new insights to farmers who were involved in this research activities. Farmers need to consider the needs of the market demand, i.e.: the quality of timber produced by smallholders. This new approach is expected to affect the paradigm of private forest farmers on managing their farms to have an adequate impact on the increase of their income to their livelihood and to have their position as the master of their owned land.

### **Empowerment in Forest Management Unit (FMU) of Batulanteh.**

Setiajiati, F., Hendrayanto, H. (Bogor Agricultural University)

FMU of Batulanteh was just established in 2012, yet some problems have been remaining since several decades ago. This research aimed to understand the characters and competency of forest community, then to design the scheme of partnership and community empowerment. Participatory rural appraisal for 3 months, field observation, and structured interview with 85 respondents, semi-structured interview with 50 informants, focus group discussion, literature search, and qualitative and quantitative

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descriptive analysis were conducted in August 2015-June 2016. The welfare of forest community was in low rate. Their competency and attitude for forest protection was in moderate level, and their knowledge about forest policy was poor. This condition encouraged community “to know, willing but unable to carry out” the sustainability due to economic needs and lack of supervising. Therefore, the forest protection was prioritized on economic aspects and conservation agriculture. The community empowerment could be conducted in regular schedule while improving the welfare by giving job opportunity in FMU activities, agroforestry practicing, building partnership in non-timber forest product business, and giving responsibility in forest protection by partnership scheme.

### **Analysis of Cultural Landscape in Forest Management by Indigenous People of Sahu Indigenous People in West Halmahera Regency**

Kastanya, A., Silaya, T., and Mailoa, A. (Pattimura University)

Traditional and cultural landscape has a conservation value that is linked to the continuance of traditions, so that the landscape doesn't only exist for functional or visual, aesthetic reasons but also has a responsibility to local culture. This research was done using the descriptive research method with a quantitative and qualitative approach. Analysis of the *chisquare* showed that factors outside of the land had an influence on the level of community income. The Sahu ethnic group had traditional land rights in forest management because of community agreement through the traditional legal council. This council satisfied the specific characteristics on the subject of native rights, existence of specific boundaries of the land as *lebensraum* which is an object of native rights, and the existence of a traditional, legal community authority to take specific steps. In macro the organisation of the landscape in the area covered by the Sahu ethnic group is divided into forest, housing and agricultural areas. Continuity of the organisation of cultural landscape appears in quadrant 1. The forest area surrounds the agricultural land and the residential area. This position demonstrates that continuity of the cultural landscape in forest management faces some threats but still has internal strength.

### **Bamboo Rangers: A Model of Participatory on Community Bamboo Forestry Management**

Ekawati, D (Center for Socio Economic Policy and Climate Change Reseach and Development, Ministry of Environment and Forestry.) and Rabik AA (Enviromental Bamboo Foundation). desyahputra@yahoo.com, ariefindobamboo@gmail.com

Bamboo is a green and sustainable material which has potential utilization as wood substitute products beside its benefit in community daily life. In Bali, bamboo demand still remains high, it consumed 2 million bamboo stems for ceremonies and furniture based on data of Ministry of Industry in 2010. Kintamani district known as raw bamboo producers in Bali, but nowadays bamboo began to be defeated by other commodities such as coffee and orange. The selling price of bamboo determined by quality and age of

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bamboo, it required an effort to improve bamboo's quality and appropriate harvesting. Therefore, a capacity building to improve management of existing bamboo resources for bamboo farmers is needed. The method for this activity was field school where farmers work and conduct direct practice in their own bamboo clumps. They also develop their roles, rules and duties for each member of the group on managing their bamboo plantation.

This activity conducted during in year 2014 - 2016 in order to develop a mechanism and system on community bamboo management. The farmers established a community bamboo forestry group called "bamboo rangers" to ensuring proper management on their bamboo clumps to achieve sustainable community bamboo forestry.

Sub-theme:

### **Session 3.5. Intensive Wood Production and Its Potential for Benefiting Non-Wood Values In Extensive Forests.**

Chairperson(s): Russell Warman (University of Tasmania, Australia), Romain Pirard (CIFOR)

#### **Do Tree Plantations Support Natural Forest Conservation?**

Pirard, R. (CIFOR)

There has been a proposition that timber plantations can support natural forest conservation outcomes when wood logged in extensive natural forests is substituted by wood production from smaller areas of intensive timber plantations. We reviewed evidence both empirical and theoretical, and emphasized methods to explicitly address causative mechanisms and potential negative or positive feedback processes. We find a convergence of conclusions of reduced degradation of natural forests associated with the expansion of timber plantations, but also potential increased deforestation due to either lower market value of natural forests in the absence of logging, or displacement effects.

Results also suggest that there is potential for cultivated timber to mitigate pressure on natural ecosystems, yet it faces a number of limitations such as variety of products involved with some poorly substitutable (e.g. precious woods), adverse impacts when monoculture plantations cover vast areas (and replace natural forests in worst cases), or the fact that increasing supplies with cultivated trees entails the risk of a rebound effect with lower prices and increased demand also from natural ecosystems.

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## The Plantation Conservation Benefit: An Australian Case Study

Warman, R. (Faculty of Science, Engineering and Technology University of Tasmania)

Australia has implemented a range of policies over the last few decades designed to both increase wood production from intensive plantations and increase the area of natural forests allocated to conservation reserves. As such it provides a significant case study on the potential of the *plantation conservation benefit*—the land-sparing potential of intensive wood production from plantations to allow greater allocation of natural forests to non-wood conservation uses. This talk will present the results of research from the presenter and co-author, Rohan Nelson, published earlier this year in *Land Use Policy* titled, 'Forest conservation, wood production intensification and leakage: An Australian case.' This work analysed the situation in Australia over the last eighteen years. This was a period in which both wood production from plantations increased and the area of forest in conservation reserve was also significantly increased. Wood production declines from natural forests over this period resulting from this increased reservation was more than offset by increases in wood production from plantations, leading to little discernable leakage. The analysis confirmed the potential for a land-sparing approach in relation to wood production to work in the Australian experience. This talk will conclude with consideration of the potential lessons and limitations of the Australian experience for other forest management jurisdictions around the world.

## Developing Community-Based Forest Ecosystem Service Management to Reduce Emissions from Deforestation and Forest Degradation

Muttaqin, M.Z. , Alviya, I , Lugina, M., Hamdani, F.A.U, Indartik, (R&D Centre for Socio-economics, Policy, and Climate Change, Forestry and Environmental R&D and Innovation Agency (FOERDIA), Ministry of Environment and Forestry, Republic of Indonesia) and Tacconi, L. (Australian National University)

At the site level, communities who manage and conserve forests are parties influenced as well as affected by the deforestation and forest degradation. Hence, understanding their roles in supporting or avoiding deforestation and forest degradation is important to support national effort in reducing carbon emissions from forest. This study involves 9 communities within 3 provinces comprising Papua, Central Kalimantan, and Riau, to analyse their interests in utilising forest products and services and to identify resources that can be used for developing an ecosystem service utilisation plan. This study uses qualitative approach through stakeholder interviews, focus groups, and field observation. The findings reveal that communities utilising their customary forests or state forest allocated to them are not supported with a strong and legitimate organisation. Furthermore, they are willing to avoid deforestation and forest degradation, but have no plan to sustainably manage their forests. Hence, strengthening organisational structures and developing a good plan for better and more sustainable practices of forest ecosystem services are needed to enhance their participation in reducing emissions from

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deforestation and forest degradation.

### Wood Identification of Medicinal Plant Species, A Review

Andianto (Forest Products Research and Development Center)

A particular species of wood as raw materials for herbal medicine can be mixed with other species that in visual appearance look almost similar. As a result, the quality and quantity of chemical compounds as contained in such mixed materials may be not in accordance with expectation. The wood identification through anatomical features can provide valuable information in the sorting process of wood species as raw materials for medicinal herbal. Identification is moreover useful for law enforcement related to the determination and confirmation of the rare and endangered medicinal plant species.

Technique of Identification is performed through observation of anatomical features on slide preparation and maceration under a microscope. The terminology of wood anatomy referred to IAWA list microscopic features for hardwood identification. This paper provides a review on the identification of medicinal plant wood species, comprising Pasak Bumi (*Eurycoma longifolia*), Eagle/aloewood (*Aquilaria* sp. and *Gyrinops* sp.), as well as Kayu manis, Massoi, Gemor, Medang, and Pakanangi/Kisereh (*Cinnamomum burmanii* Blume., *C. coriaceum* Camm., *C. zeylanicum* Blume., *C. xanthoneureum* Blume., *Cryptocarya aromatica* Kosterm., *Alseodaphne foetida* Kosterm., *Litsea odorifera* Val., *C. parthenoxylon* Meissn., *C. celebicum* Koorders. *C. subavenium* Miq.). Based on the anatomical features of wood, particular wood species categorized as medicinal plants can be distinguished from each other.

### Fibreboard as Raw Material Substitute For Wooden Handicraft Products

Indrawan, DA, Tampubolon RM, Wibisono HS, Iqbal M and Pari G (Research, Development and Innovation Agency – Ministry of Environment and Forestry)

Wood utilization for handicrafts should be replaced by its substitute due to wood supply decline from forests. One alternative source to substitute wood is fibreboard. In this study, fiberboard being used was manufactured with wet process using NaOH, a process that could be applied in small and medium-scale enterprises. Fiber board manufacture is easy and also can use non-wood ligno-cellulosic raw materials such as grass (*Saccharum spontaneum* L.), and oil palm empty fruit bunches. The results showed that the yield of *Saccharum spontaneum* L. are 68-74 %, while oil palm empty fruit bunches are 62-67 %. Based on the hardboard's physical mechanical properties, fiber with best prospects for fiberboard production is mixture of 50 % *Saccharum spontaneum* L. and 50 % oil palm empty fruit bunches. With the availability of fiber board, it is expected that craft industry would no longer rely solely on wood as raw material, but could also use naturally available non-wood ligno-cellulosic raw materials that have not been widely used, but which will gain added value for its utilization in handicraft industry.

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## Carbon Footprint Analysis on Pine Activated Charcoal Manufacturing (On Laboratory Scale)

Hastuti N, Pari G, Wibowo S, Hendra D, Wibisono HS, and Efiyanti L. (Forest Products Research and Development Center, Research Development and Innovation Agency, Ministry of Environment and Forestry).

Utilization of lignocellulosic materials are promising to be converted as activated charcoal which are can be used for various applications. One aspect which is rarely observed in activated charcoal manufacturing is the analysis of environmental impacts. The present study aimed to analyze the carbon footprint activated charcoal manufacturing derived from pine wood on laboratory scale. The process of activated charcoal manufacturing started by wood carbonization at temperature 400-500°C for 4-5 hours. The activation process carried out by using water vapor at temperature 800°C for 60 minutes and 90 minutes. The analysis is limited on carbon footprint of raw materials (wood pine) conversion to be activated charcoal on laboratory scale. By knowing the carbon footprint of activated charcoal manufacturing derived from pine wood can provide information about the changes in carbon stocks of wood conversion into activated charcoal and the amount of its potential carbon emissions.

Sub-theme:

### Session 3.6. Sustainable Community Forest and Wood Production

Chairperson(s): Ahmad Dermawan (CIFOR)

#### Which Smallholders are willing to Grow Fast Wood in the Partnership Schemes? Evidence from Choice Experiment Study

Permadi, D.B. (UWA, Australia)

To increase the equity between large-scale and small-scale forestry, Indonesian government has allocated budget to prioritize the development of smallholder forests via afforestation programs. It has also designated that one third of national timber production, 25 million m<sup>3</sup>/year, will come from smallholder forests outside forest areas by 2019. However, growing complexity in socio-economic, cultural, and institutions of forest rehabilitation programs may hamper the outcomes. This implies that not all smallholder forests that exist today will exist into the future. Therefore, it is important to identify sorts of forest policy that encourages the establishment of new and permanent smallholder forests, especially through planting trees. This will best be achieved by policy changes that have direct impacts on the incentives of smallholders to grow trees under long-term afforestation contracts. The purpose of this study is to explore potential changes in the smallholders' willingness to adopt fast growing trees, i.e.: acacias for pulpwood in private land, given changes in the levels of afforestation contract attributes, and to identify causes of heterogeneity in the preferences. We use Choice Experiment

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(CE) technique to detect changing willingness to accept proposed afforestation contract options and estimate marginal value of the attributes in monetary terms. We collected data from 340 smallholders in Indonesia to estimate six attributes of afforestation contracts, namely: contract duration, labour participation, timber insurance, trainings, road improvement, and expected income. The results show that higher income and road improvement would significantly induce smallholders to grow more fast wood, while the longer the contract length would decrease smallholders' probability to accept the contract options. Investigation of the heterogeneity in preferences using latent class modelling revealed that four types of smallholders valued each attribute in different ways, implying to target smallholders more effectively and allocate incentives more fairly. It found that these heterogeneous preferences sourced from different forest transition stage, occupation, experience in tree farming and risk orientation. It suggested that changes in afforestation attributes focusing on hybrid strategy, a combination between production and rural development, would be a fairer option for both smallholders and forest agencies.

### **Integration Of Community Wood's Production**

#### **And Process As A Solution To The Development Of Community Forest Business**

Hardjanto, Hero, Y., Ichwandi, I. (Department of Forest Management, Faculty of Forestry, IPB, Indonesia)

Community forest has an important role in Indonesia economy. There are many ideas for business development of community forest; one of them is through production integration with community's wood industry. This research is to verify production integration at the farmers' level with the process at industry level. The research objective is to analyze forest and business sustainability and to analyze the factors that influence the integration of production and industry. The methodology being used to collect primary data is through structured interview and Focus Group Discussion (FGD). The analysis methodology of forest sustainability and community forest's business sustainability is using balance approach between Supply(XS) and Demand (XD). The analysis of factors that influence the integration is through stakeholders' analysis. The research result suggests that in West Bogor area there is quite big wood deficit of 600% or 6 times more. Community forest business will be preserved because there is a big demand of woods, but woods processing industry tends to be not sustained because of the big deficit of the raw materials. Some factors which determine the realization of this integration are: the seriousness of the industry to cooperate with the farmers, the strong availability of funds from the industry, the big and sustainable amount of wood production, the seriousness of the farmers to obey the cooperation, the seriousness of famers group to take the risk and earn revenue together and the seriousness of government through forestry field instructor to develop the farmers group.

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## When Wood Production Comes Out Of the Woods: The Resilience and Transformability of Forestry

Warman, R. (Faculty of Science, Engineering and Technology University of Tasmania)

Globally, social-ecological systems of wood production are undergoing a fundamental evolution—from extracting wood from naturally regenerated forests to purposeful wood cultivation more akin to agriculture. The underlying logic of stewardship forestry—sustained wood production from extensive forest management—is being challenged by the unravelling of the forest / wood nexus in this transition. In this paper, resilience thinking is used to describe this transition in terms of a sequence of distinct ‘basins of attraction’—resilient states within social-ecological systems. Resilience concepts can describe complex sets of interacting phenomena as whole systems in a way that analysis through the silos of traditional disciplines cannot. This paper conducts a critical analysis of the dominant forest / wood production basins and their underlying logic or paradigmatic rationale. In particular, it reviews the hegemonic basin of stewardship forestry and considers its precariousness in the face of increasing challenges from both intensive wood cultivation and rising demand for non-wood values from extensive forest areas. It proposes that forest management policy should look to actively manage transformational change to new basins of wood cultivation and forest ecosystem management rather than continue ongoing attempts at adaptation within the historically dominant stewardship forestry basin.

## Consumers’ willingness-to-pay for modern wooden structure buildings: compare between China and Japan

Luo W, Mamoru K, Kenji M, Matsushita K, and Mineo K.

The utilization of timber material in constructions has a long history in Asian countries, especially China and Japan. Wood as an eco-friendly constitution material, plays an important role in sustainable development. However, during the past decades, the early modern wooden structural industry in Japan has been developed rapidly compare with China, since the distinct domestic situations, such as forest resource, timber import and export, forestry industrial development, government policy and geographical factors. This study analyzed the modern wooden structure market at consumers’ level in Japan and China under different market histories and cultures. Several factors have been examined as determinants of consumers’ willingness-to-pay for modern style wooden hotels and houses. The results will help to give a better understanding of the modern wooden structure market in Japan and China, and make suggestions to policy makers and certificate makers, and also companies in modern wooden structure promotions.

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## Responsible international market, and the certification of wood industry and community forest in Java - Indonesia.

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The growth of international responsible market of Indonesia wooden furniture industries is driven by consumer countries such as European Union. In Java, this growth motivates artisans to become a global actor to access wider market. The market institution rules artisans to fulfill legality verification mandated by government and sustainability certification promoted by civil society. This requires artisan to purchase a timber originated from certified community forests.

We studied how artisans use the certificate and collectively participate in the exhibition in Jakarta and Köln to get more international buyers. We also studied how they improve their business relation with community forests. The study found the certification strengthen the identity of artisans a smallholder business who becoming a global player and pleasing the interest of buyers. We noticed the exhibitions effectively connecting artisans with appropriate buyers. The artisans have built a fairer business relation with forest farmers based on mutual respect by paying higher price for certified timber. The forest farmers observed as the most vulnerable actor in the timber value chain, this initiative is increasing their opportunity to get more equal economic benefit. Findings suggest to generating more artisans who are knowledgeable global player and promote more equal economic benefit.

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## MULTISTAKEHOLDERS COLLABORATION IN FORESTRY AND ENVIRONMENT MANAGEMENT

Sub-theme:

### Session 4.1. Multistakeholders' Cooperation in Forestry Research

Chairperson(s): Bambang Irawan (University of Jambi)

#### Stakeholder's Movement on Forest Resource Management: A Study in Merangin District- Jambi Province

Hidayat, H. and Siagian, H. (Indonesian Institute of Sciences (LIPI)-The Research Center for Society and Culture)

This study investigates three critical issues on forest resource management in Merangin District, Jambi Province. Firstly, it emphasizes how forest land conversion for oil palm plantations and mining without strict control that eventually effects on deforestation. Secondly, it highlights how migrant tribes from South Sumatera for instance (Lahat and Pendopo sub districts, Bengkulu) carry out forest squatter for coffee plantation estate in National Park of Kerinci Seblat area in Merangin district. Thirdly, it highlights the impact of deforestation due to forest squatter, oil palm estate and mining which subsequently effect on ecological damage.

Obviously, confronting three issues requires considering stakeholders' movements and views on the role of government, private companies, NGOs, and participation of local communities. Based on the field findings, the role of government, which is represented by the Ministry of Environment and Forestry, Forestry Agency Office in Province and District as well, is very significant in issuing regulating and give sanctions to logging concession holder and migrant tribes from South Sumatera. Therefore, in order to implement sustainable forest management (SFM), the government invites logging concession holder and participation of local community on developing forest resource by planting trees which the scheme of social forestry and village forest. This livelihood is shift from early time as paddy rise and agroforestry estate toward coffee plantation, especially for migrant tribes and few members from local community. In contrast, the role of NGOs is very important in launching a critique the impact of ecological damage for instance soil erosion, flood and water contamination which seriously affect by forest squatter and mining.

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## Model of Multistakeholders Forest Management: A System Study of the Protected Forest Management Unit in Solok, Indonesia

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Multistakeholder forest management can be influenced by many factor and will be difficult because they have different expectations of the process. This paper discuss the integration of soft systems methodology (SSM) within a multistakeholders approach in research to support sustainable and equitable forest management of the Protected Forest Management Unit (PFMU) in Solok, Indonesia. The management of PFMU in Solok is complicated by legitimacy of forest right, institutional culture, political interest, illegal logging, the topography is varied, existing watersheds and limitations of forest inventory data. The situation is characterized by complex ecological and uncertainty about the nature of relationships among actors and elements in the system. In this work, SSM contributed to description of the PFMU situations. The model was developed by identifying forest management objectives, building a conceptual model of relevant systems using a causal loop diagram and defining performance indicators. The model was then used to stimulate debate about desireable and feasible change. As well as exploring future scenario to improve well-being of local stakeholders while maintaining forest quality. Finally, multistakeholders approach by implementing of SSM principle was found to be an effective way to explore a collaborative action plan to sustainable and equitable forest management.

### A Rose by Any Other Name? Evaluating Landscape Approaches in the Tropics

Reed, J. (CIFOR, Lancaster Environment Centre, Lancaster University, UK), van Vianen, J., Sunderland, T. (CIFOR), Barlow, J. (Lancaster Environment Centre, Lancaster University, UK)

We evaluated the implementation of integrated landscape approaches across 51 tropical countries. Our findings indicate that landscape approaches can be successful in improving social capital, enhancing community income and employment opportunities as well as reducing land degradation and conserving natural resources. However, comprehensive data on the social and environmental effects of these benefits are still lacking. We identify key contributing factors towards implementation, and progress, of landscape approaches and suggest that multi-level governance structures correlate well with success. We conclude that landscape approaches are a welcome departure from previous unsuccessful attempts to reconcile conservation and development in the tropics but remain nascent in both their conceptualization and implementation.

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## Stakeholder Analysis in the Implementation Of Giak Siam Kecil-Bukit Batu Biosphere Reserve Concept, In Riau, Indonesia

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Biosphere reserve concept is an inclusive approach to integrate conservation of biodiversity and sustainable development in landscape scale. The implementation of biosphere reserve concept requires an integrated management strategy and engages stakeholders. The aim of the study is to analyze the importance and the influence of stakeholders, as well as how they interact in applying GSKBB Biosphere Reserve concept in Riau, Indonesia. The data were collected by document study, field observation, and indepth interviews with informant who was selected through snowball sampling. Analysis conducted qualitative descriptively. The result of the study identified 37 stakeholders of GSKBB Biosphere Reserve, consist of 10 key players, 9 subjects, and 7 context setters, and 11 crowds. Those that belong to key players are BBKSDA Riau, SMF, BAPPEDA of Riau Province, BAPPEDA of Regency (Bengkalis, Siak, Dumai), Community Empowerment and Rural Development Agency of Riau Province, Research and Development Agency of Riau Province, Environmental Agency of Riau Province, Regency Environmental Agency, Indonesian MAB National Committee, and Indonesian Institute of Science. The relationship between stakeholders formed is cooperation and conflict. Indonesian MAB National Committee has been active in establishing a coalition with SMF, BBKSDA Riau, and local government at the proposal stage of GSKBB Biosphere Reserve to the UNESCO, but the level of cooperation decreased in the implementation phase. The coalition between BBKSDA Riau and SMF still persist in conducting several program and activities in the core areas and buffer zones. On the other hand, conflicts in land use still occur among community with BBKSDA Riau and SMF. Indonesian MAB National Committee should play an active role in empowering other stakeholders, especially local government by facilitating secretariat of management coordination agency of GSKBB Biosphere Reserve to make communication among stakeholders and gain access to government and international facilities.

### Modelling the Distribution of *Shorea Leprosula* in Kalimantan, Indonesia: A Tool for Conservation Planning

Lestari, N. S. (Dipterocarp Forest Ecosystem Research Center, Ministry of Environment and Forestry, Samarinda) and Elith, J. (School of BioSciences, the University of Melbourne, Australia)

*Shorea leprosula* belongs to the Dipterocarpaceae family, a dominant family in Indonesia's rainforest. The population of this species has been depleted due to extensive logging, high rates of deforestation and forest degradation in the past several decades. However, the current status of the species' range and distribution remains unknown. This research project aims to understand and predict the distribution of *S. leprosula* in Kalimantan using species distribution models (SDMs). This study used presence records

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and presence-absence records from field surveys and the Global Biodiversity Information Facility (GBIF) database. Two modeling methods, MaxEnt and generalized linear models (GLMs), were used to predict species distribution. Prediction maps varied with modeling methods and different datasets, producing different emphases on areas suitable for *S. leprosula*. Even though the descriptive and predictive capabilities of the models are considered modest, the models provide useful insights about environmental factors that affect the distribution pattern of *S. leprosula*. Given the limitations of species records used in this study, the model outputs also need to be cautiously interpreted to avoid prediction biases. This research project also highlights some issues that arise in using small sample sizes in developing the model. Despite its limitations, the prediction maps generated by the models can give some hints to identify the areas with high possibility of the presence of *S. leprosula* in Kalimantan. In addition, this research project also provides some important information on how to improve model predictions for future development to support species conservation in Indonesia's rainforests.

### **Stakeholder Mapping in Conflict Resolution Efforts in KHDTK Labanan, District of Berau**

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Conflict resolution in KHDTK Labanan in Berau District by the Balai Besar Penelitian dan Pengembangan Ekosistem Hutan Dipterokarpa (Balai Besar) needs the support of other parties are also interested in the existence of such KHDTK. This paper aims to present the results of the mapping of the parties who can be engaged by the Balai Besar for the resolution of conflicts in KHDTK Labanan. Research conducted around the month of June to December 2015 using interviews to key respondent and study of literature as a way of collecting data, while data analysis is done by using a stakeholder analysis and matrix based on their influence and importance level. The results of the study are: (1) There are 19 (nineteen) of the parties who have an interest in the existence of KHDTK Labanan including the Ministry of Environment and Forestry (LHK), Ministry of Energy, Badan Penelitian, Pengembangan dan Inovasi (BLI), Berau District Government, Balai Besar, KPH Model Berau Barat, local communities around KHDTK Labanan, PT Hutan Sanggam Labanan Lestari (HLL), Center of Orang Utan Protection (COP), Balai Pengelolaan Daerah Aliran Sungai (BP DAS) Mahakam Berau - PT Nusantara Berau Coal (NBC), Dewan Perwakilan Rakyat Daerah (DPRD) Kabupaten Berau, Kecamatan Kelay, Sambaliung and Teluk Bayur, PT Kaltim Jaya Bara (KJB), PT Rimba Anugerah Kaltim (RAK), Balai Konservasi Sumberdaya Alam (BKSDA) Kaltim, Armed Battalion of 18/105 Tarik Buritkang, Yayasan Bestari and Forestry and Climate Change (ForClima); (2) Based on the grouping on the results of stakeholder analysis and matrix level of influence and interests, then several stages to do the Balai Besar in the resolution of conflicts in KHDTK Labanan is (a) Ensure key stakeholders in Group C, namely the Ministry of LHK, the Ministry of Energy and BLI have a common perception in the presence and management KHDTK Labanan; (B) Establish partnership with primary stakeholders in Group C, namely KPH Model Berau Barat, PT HLL and PT Berau Coal; (C) Establish partnership with primary stakeholders in

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Group A which local community around KHDTK and COP; (D) Establish partnership with stakeholders secondary in Group D which Berau District Government, DPRD Berau, Yayasan Bestari and ForClime, and the last (e) Gain support from stakeholders secondary from Group B is BP DAS Mahakam Berau - PT NBC, Kecamatan (Sambaliung, Kelay and Teluk Bayur), PT. KJB, PT. RAK, BKSDA Kaltim and Armed Battalion of 18/105 Tarik Buritkang.

### **Identifying Land-Forestry Policy Levers from Participatory Understanding of Drivers of Forest Conversion: Case Study from Three Provinces of Indonesia**

Joni, A., Ekadinata, A., and Dewi, S., (World Agroforestry Centre (ICRAF), Southeast Asia)

Forest conversion in Indonesia is always considered as one the most important source of environmental services degradation in the country. Although a lot of effort has been conducted, ineffective action is often occurred because of failure to understand the right drivers of forest conversion. We use the Driver–Pressure–State–Impact–Response (DPSIR) framework in a multistakeholder-participatory processes to identify the most suitable responses to address forest conversion in three provinces of Indonesia: South Sumatra, East Kalimantan and Papua. The processes consist of several key steps: identifying network of factor for forest conversion, selection of key factors, identification of policy levers to address the key factor and public consultation on the options of policy levers. The results has shown differences of key driving factors for forest conversion in the three provinces. In Papua province, key drivers for forest conversion are high demands of land for agriculture, while in East Kalimantan it is transmigration, whereas in South Sumatera, it is the food self-sufficiency programs. Differences of key factor leads to choices of response to forest conversion that are suitable in each provinces i.e. changes in land use policy or development of alternative livelihood.

**Sub-Theme:**

### **Session 4.2. Public-Private Partnership in Forest Management**

Chairperson(s): Aida Greenbury, Ahmad Budiaman

#### **Public–Private Partnership in Forest Restoration of Samboja Research Forest**

Rahayu,S. (World Agroforestry Centre), Basuni,S., Kartono, A.P., and Hikmat, A. (Bogor Agricultural University)

Samboja Research Forest in East Kalimantan is 3.504 hectares of lowland mixed Dipterocarp forest where 50% the area is degraded at various level of degradation, from less degraded to heavy degraded covered by grassland. Lowland mixed Dipterocarp forest of Samboja kwon as an ecosystem with highest tree species richness in Kalimantan and habitat of about 55 Dipterocarp species and *ulin (Eusideroxylon zwageri)*. Restoring forest

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through various mechanisms such as protecting area, assisted natural regeneration and planting species depend on the degradation level is highly important to species conservation purposes. However, budget allocation from government for those purposes is very limited. The aim of this study is to identify potential source of budget from private sectors for financing Samboja Research Forest Restoration. Key informant interview had been conducted to various stakeholders included Research on Natural Resources Conservation Technology in Samboja, East Kalimantan Forest Officer, Kutai Kertanegara and Penajam Paser Utara Forest Officer, Lectures of Mulawarman University, Forest Research and Development Agency. The research result identify that Ijin Usaha Pinjam Pakai Kawasan Hutan (IUPPKH) of mining companies in East Kalimantan, Corporate Social Responsibility (CSR) of several industrial company in Balikpapan as potential source of funding for Samboja Research Forest restoration.

### **Creating Synergies among Stakeholders to Support Private Forest: Lessons from Indonesia**

Rizal AHB, Nurhaedah, Hayati N., Sumirat, B. (The Environment and Forestry Research and Development Institute of Makassar, Ministry of Environment and Forestry of Indonesia), Race, D. (The Australian National University, Canberra, Australia).

The success of private forest depends on the cooperative relationships between many different actors, i.e.: smallholders, district forestry agency, market brokers (middlemen), and company staff. If these relationships are ineffective, or in conflict, then the benefits from community forestry are likely to be limited. This research showed on a critical assessment of a process to create cooperative relationships between diverse actors needed for the success of private forest in South Sulawesi, Indonesia, with a range of actors – public and private, local and national – during period 2005-2013, during which time private forest increased in scale by 65 percent and now has an estimated commercial value of US\$4.8 million. Yet the relationships between all the important stakeholders was not always cooperative. The data collected through observation of local meetings, in-depth interviews with a range of stakeholders, focus group discussions with stakeholders, and analysis of policy documents and secondary data. We have identified some critical ingredients to ensure synergies or positive relationships between different stakeholders can be explicitly developed and maintained for the success of private forest, include: training for smallholders, developing a local forest business association, assisting local agencies in reviewing policies and regulations, and facilitating a multi-stakeholder discussion forum.

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## A Thousand Bamboo Villages, As an Enabler for a Community Based Bamboo Industry in Indonesia

Rabik, A. (Environmental Bamboo Foundation and IndoBamboo Lestari) and Ekawati, D. (Center for Socio Economic Policy and Climate Change Research and Development, Ministry of Environment and Forestry)

A thousand bamboo villages is basic outline of a strategy on catalyze revenue from bamboo industry supported by community base bamboo forestry management in Indonesia. This is an integrated program of multistakeholders mechanism involving four main supporting pillars, such as 1) government, 2) community, 3) micro finance institution and 4) industrial player.

This program started at the village level where community taking responsibility for the planting, managing, and primary processing of bamboo raw materials. The industry purchased semi finished products from community where value adding process has been carried out. The revolution of bamboo industry conducted in order to 1) breaking down the supply chain, 2) opportunity to local to do first step value added processing, 3) reduces risk of financial and material waste. Running model of community based bamboo industry for a thousand bamboo villages in Indonesia established in Ngada Regency, East Nusa Tenggara supported one lamination bamboo factory in production since 2012. Community based bamboo forestry is the most secure model which will support to develop a viable and sustainable mid-level industrial scale. A thousand bamboo villages will increase revenue of community and government, as well as establishment of a resilient bamboo industry in Indonesia.

### Discursive Fragmentation in Global Forest Governance: Myth or Reality?

Isailovic M, Guerra FD and Pattberg P. (Institute for Environmental Studies, VU University Amsterdam). [marija.isailovic@vu.nl](mailto:marija.isailovic@vu.nl)

This paper analyzes the forest governance regime complex with regards to its discursive structure. Using QDA Miner and WordStat, we scrutinize whether the forest governance regime complex is discursively fragmented or rather integrated and coherent. Coherence in terms of the underlying discursive structure would indicate that the forest governance arena is less a “non-regime” than often assumed, while fragmentation might be interpreted as a sign for the forest governance arena of indeed constituting a non-regime. First, we analyze the overall discursive structure of the regime complex by mapping dominant discourses found in the mission statements of ca. 80 institutions making up the overall forest governance architecture along four ideal-type meta-discourses frequently identified in the literature. Second, we measure discursive coherence within each zone of the governance triangle. We content that if the overall issue area is dominated by one meta-discourse while discursive homogeneity is high within individual zones, discursive fragmentation is low. On the other hand, we assume discursive fragmentation to be high when the overall sample displays various equally

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strong meta-discourses and individual zones are discursively heterogeneous (i.e. the discourses are equally strong).

Sub-Theme:

### **Session 4.3. ASEAN Cooperation in Forestry Researches**

Chairperson(s): Leti Sundawati (Bogor Agricultural University)

#### **Overlapping of Forest Certification Regime in ASEAN: Analysing conflict between Private, State and Regional Governance**

Wibowo A (Department of Forestry, Faculty of Agriculture, University of Palangka Raya, Kampus UNPAR), Sahide M.A.K. (Laboratory on Forest Policy and Entrepreneurship, University of Hasanuddin), Nurrochmat D.R. (Bogor Agricultural University), Giessen L. (Chair Group of Forest and Nature Conservation Policy, University of Goettingen)

A new regional arrangement on criteria of sustainable forest management was agreed by ASEAN member countries along with the effort of five of its single countries in negotiating and implementing FLEGT agreement with the European Union. Both regional and a group of bilateral cooperation were raised as response to the voluntary private forest certification initiatives which have been shaped by non-state actors. With its high standard and broad acceptability the private forest certification, however, is deemed as economic instrument that privileging large-scale business and less recognizing traditional forest management. Using theory of international bureaucracy and international regime frameworks this study aims at (i) demonstrating the actions took by influential actors in constructing forest certification regime, (ii) mapping actors' formal and non-formal interests in forest certification politics, and (iii) explaining potential alliance created based on actors' interests. The results show that state actors act progressively in gaining benefits from "educated market" installed by the private ones. All form of forest certification governance tends to prioritize economic demands. Lastly, implementation of ASEAN standard for sustainable forest management will face many blockades due to divergent national interests, quite identic forest products and the low volume of timber exchange among ASEAN countries.

#### **Bilateral International Forest Cooperation under the International Forest Governance: Learning from the Republic of Korea Case**

Park, M. S. (Department of Environmental Planning, College of Life and Environmental Sciences, Konkuk University)

International forest governance has established and implemented at the global society. It influenced national forest policies & strategies and international relationships among countries. International forest-related negotiations including climate change,

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desertification and biodiversity put pressure to states for responding to the environmental and forest issues. This paper aims to examine contributions of international forest governance to domestic forest policies through case study of the Republic of Korea (ROK). ROK has shared knowledge and experiences of successful reforestation with other countries, especially developing countries. Focuses of international forest cooperation policies by ROK have been changed over time. This paper analysed contents of bilateral international forest agreement (memorandum of understanding) between ROK and other countries to find keywords of international relations in the field of forestry. Keywords of bilateral international forest agreements were classified to groups. The contents of bilateral international forest agreements were interpreted, linking with the history of international forest governance. The research finding can contribute to understanding inter-connection between bilateral relationships between countries and the international forest governance.

### **Assessing Carbon Sequestration from Various Land Uses and Community Readiness on Climate Change Mitigation in Rural Area of Indonesia**

Sundawati, L., Trison, S, Budi, S.W, Nurrochmat, D.R, Darusman, D., Siregar, I.Z., Wijayanto, N. (Bogor Agricultural University)

Reducing emission through sustainable land-use management is very important for Indonesia, not only for the issue of the climate change but also to increase the efficiency of land resource utilization. The Government of Indonesia formed a national plan based on Presidential Regulation Number 61/2011 on “National Action Plan for Reducing Green House Gases” which is in accordance with “Nationally Appropriate Mitigation Actions” (NAMAs) as part of Bali Road Map approved by UNCCC 2007 in Bali, Indonesia and Copenhagen Accord published after COP 15 in 2009. Implementation of NAMA in Indonesia is facing several constraints, among any others is the low level of human resource development on facing the climate change issue. This study aims to find out: (1) how rural community coping with climate change issues, (2) are they ready to conduct climate change mitigation actions, and (2) do existing agriculture land-based activities conducted by rural community contribute to the emission reduction. Social survey from 100 household at Cicantayan Village Sukabumi District shows that most of respondent has low level of knowledge and awareness on global climate change. Although that some of them aware that there was changing on daily temperature, seasonal pattern, and number of rainfall. Efforts on climate change mitigation by rural people were almost none, but some of them planted trees as an effort to reduce temperature surrounding their housing area. There were four types of land-uses which integrate tree species conducted by rural community at study location, namely home garden, mixed garden, fruit orchard and woodlot. Vegetation analysis conducted at those four type of land-uses shows the potency of tree species with diameter more than 10 cm varied from about 115 trees/ha at home garden, 160 trees/ha at mixed garden, 150 trees/ha at fruit orchard, and 215 trees/ha at woodlot. The highest carbon stock was estimated at mixed garden (46.36 Ton/ha), followed by woodlot (43.80 Ton/ha), fruit orchard (37.78 Ton/ha), and home garden (11.18 Ton/ha) as the lowest. *Paraserianthes falcataria* is a fast growing tree species which has the highest contribution of carbon stock at study location. Home

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garden, mixed garden, fruit orchard, and woodlot were financially feasible with high Net Present Value (i.e. Rp 14,645,580/ha, Rp 14,387,976/ha, Rp 22,307,052/ha, Rp 16,249,925/ha respectively), Benefit Cost Ratio (i.e. 1.80, 2.10, 2.30, 2.94 respectively) and Internal Rate of Return at 13% (i.e. 30.37%, 37.09%, 41.79%, 41.94% respectively). Result of social survey in the study location found out that tree planting is the most preferred strategy that could be done by villager them self to prevent climate change. Although the villagers are willing to plant trees for climate change mitigation, they will prefer tree species and land-use system that will financially beneficial for them. So, for climate change mitigation, developing mixed garden and woodlot which have high carbon stock is the best choice. But for most of the farmers whose income depended from their small land, fruit orchard which has the highest financial performance will might be the first choice.

### **Landscape Transformation, Fire Patronage Network and Sustainable Development**

Purnomo, H. (Center for International Forestry Research (CIFOR), Bogor Agricultural University), Ali, M.( Cooperation Riau Forest Rescue Network (JIKALAHARI)), Komar, S. (World Wildlife Fund (WWF) Indonesia Program) and Okarda, B., Dewayani, A.A., Achdiawan, R.(Center for International Forestry Research (CIFOR))

Indonesia and many developing countries are facing landscape transformation from forest to agriculture in unsustainable manner. Fires are frequently used for burning forest and land for palm oil plantation development. Forest and land fires had caused death, disease outbreaks and economic loss up to more than sixteen billion US dollar in Indonesia. Billion dollar of economic loses beard also by Singapore and Malaysia due to reducing tourism, hazardous haze and turn down economy. However, there are certain actors gain benefits from fires occurrences either in forest area or non-forest areas. The incendiaries formed a network that is hardly detected. This paper aim to reveal fire patronage network as an organized crime and linked it to current government regulations issued on environment, plantation and forestry aspects. This patronage network exist at local, national and regional levels and hinder the capacity of government to rule the law for sustainable development. The study carried out by reviewing former studies, focus group discussion, and field visit in Riau Province and principle component analysis (PCA). The result shows there are three types of fire patronage network namely Corporation, Broker (*Cukong*) and Individual-on-non-forest area. Corporation network divided into three sub-type network namely Companies as the most significant actor, Cooperation and Individual-on-concession area. Specific regulations are suitable and effective to be used for targeting particular fire patronage network types. Consistent implementation of law and regulations will be able to prevent and suppress fires occurrences and sustain natural resources. Collaboration at regional level including Southeast Asia and China is a must due to the patronage network exists beyond particular countries and they have interests in reducing fire and haze as well as continue to make profit from palm oil industries.

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Sub-Theme:

**Session 4.4. Livelihoods and socio-economic factors influencing sustainable forest management**

Chairperson(s): Zahrul Muttaqin (Ministry of Environment and Forestry)

**Property Rights of Forest on National Legal Framework : a Content Analysis in Indonesian Statutory Laws**

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Property rights is the crucial matter within the national legal framework. However, forest conflicts and deforestation due to property rights obscurity were experienced by the most of countries in the global South, including Indonesia. Ironically, the researches explored forest property rights and focus on national legal framework are missing. This study aims to: (1) identify the forest property right constellation, (2) assess the tenacity of forest property rights within Indonesian Statutory Laws. Content analysis was done on 28 forest resources-related statutory laws, and comparative analysis was used for further inquiry. This study found that property rights of forest has been widely regulated, including forest ownership, management regime, and bundle of rights arrangements. However some weaknesses were found: contradictory in framing forest definition, ambiguity in forest area, unimplementable regulation in private forest recognition, irrelevant regulation in access restriction, and missing regulation in private forest management and alteration rights. Policy improvements are needed to deal with these problems, to promote regulation on private forest management and alteration rights, and to accelerate recognition of customary forests. The analysis provides support for the argument that laws and regulations play important role in determining secure property rights of forest.

**The Performance of Social Aspects in the Collaborative Forest Management in Indonesia**

Hendrawati D. (Lembaga Ekolabel Indonesia) and Muljono P (Bogor Agricultural University)

This study assessed socio-economic performance of community forestry in Indonesia. This study based on assessment conducted in 2004 - 2016 for 34 community forests using SCBFM (Sustainable Community Based Forest Management) scheme refer to the LEI (Indonesia Ecolabeling Institute) Standard 5000-3. We focused on three socio-economic indicators, namely: community economic resources sustained and support the

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continuity of intergenerational livelihood; contribution on improving local social and economic condition; and socio-economic relationship pattern established in forest management strengthen the partnership for mutual benefit. We used descriptive methods using the assessment report prepared by the appointed certification body. The results showed the resources of community income both from forest products such as wood and non-timber products, and from other businesses such as carpentry, trade, and other services are able to sustain the households economic resilience. We found contribution of community forests on increasing the local revenue from property tax and direct/indirect fees, and the provision of public facilities and infrastructure. In addition, we found that socio-economic relationships have strengthened the partnership for mutual benefit amongst community forest managers, community members, and timber traders. Results suggest further guidance and training for the community forest managers to increase their competence on sustaining the social-economic outcomes.

### **Gender Role Distribution in Land Management Around The Rinjani Barat Protected Forest, Nusa Tenggara Barat**

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This study aimed to analyze the division of roles between men and women in land management around the Rinjani Barat protected forest area. The study was conducted through interviews and gender separated discussions with total 160 farmers in four villages (Pusuk Lestari, Kekait, Buwun Sejati, and Tegal Maja). The results showed that communities around the protected forest besides cultivated their private owned land also managed forestlands through a partnership scheme with the Rinjani Barat Protected Forest Management Unit. The main commodities in four villages were palm sugar sap, durian, and melinjo (Pusuk Lestari), palm sugar sap, durian, and jackfruit (Kekait), durian and mangos teen (Buwun Sejati), coffee, cocoa, and cashew nut (Tegal Maja). Access to the information related to the type of plant, purchase of seeds and production facilities were dominated by men. Access to lending capital for land management, fully owned by women. Activities that can be accessed together were extension, training as well as the project of the government for land management and agricultural development. This study showed the importance of involving women in agricultural development planning activities, especially in the marketing, harvesting and post-harvesting. Women empowerment is very important in land and forest sustainability management.

### **Transformation of Consumption Pattern of Orang Rimba at Bukit Dua Belas National Park in Jambi Province**

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Orang Rimba have been lived inside Bukit Dua Belas National Park (TNBD) in Jambi Province since long time ago. They have interacted with forest, giving and supporting

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each other. Forest for Orang Rimba is an important place for their livelihood. Forest serves food, energy, medicine, clothing, and also home for Orang Rimba. Recently, Orang Rimba have deal with complex issues regarding social-culture problems, limited space of environment and forest resource available. The study was aimed to analyze the transformation of consumption pattern of Orang Rimba surrounding Bukit Dua Belas National Park. The consumption pattern was limited to the need for food, woods, medicines and clothing. The results show that there are three types of Orang Rimba classified to assess the consumption pattern of Orang Rimba and thus indicate the transformation occurred. Those type are Orang Rimba inside TNBD, Orang Rimba outside TNBD, and Orang Rimba in transition living outside TNBD. Orang Rimba inside TNBD consumpt cassava as their staple food, meanwhile Orang Rimba outside TNBD consumpt rice by purchasing it. Orang Rimba inside TNBD utilize forest resources for their housing, meanwhile Orang Rimba outside in transition settled down in the housing built by government. Orang Rimba in this type are also familiar with modern equipment such as television, mobile phone, and motor cycle. The similarity between those types is they still highly depend on forest as source of herbs and medicines.

#### **Finding Alternatives of Livelihood Sources for Forest Dependent Communities in Protected Areas: A case study of Sebangau National Park, Central Kalimantan Province, Indonesia**

Meilani M, Thwaites R. (Institute of Land, Water and Society, Charles Sturt University, Australia), and Race D. (Tropical Forests and People Research Centre, University of the Sunshine Coast, Queensland, Australia). mmeilani@csu.edu.au or mei.meilani@yahoo.com

This study evaluates the impacts of the establishment of Sebangau National Park (SNP) on local people's livelihoods. SNP was established in 2004 and covers more than 560 thousand hectares peat swamp forest in Central Kalimantan Province. SNP was a production forest for more than 20 years and almost half of the area has been degraded. SNP is surrounded by almost 50 thousand people whose livelihoods depend on SNP's resources. This study shows that the establishment of the park changes the livelihood strategies of local communities to survive. People shifted their livelihood sources from forest resource extractions, particularly logging, to agriculture (farming and fishing). Some strategies to maintain and improve the livelihoods of local communities within restricting regulations of SNP management include: (1) regulating the collection of non-timber forest products so that it would not threaten the ecological balance of the forests; (2) developing agroforestry system; (3) involving local communities in the rehabilitation programs within rehabilitation zone; (4) developing ecotourism; and (5) involving in communities in the REDD+ program prepared by SNP.

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## Construction of Local Wisdom the Private Forest Farmers On the Utilization of *Duwet* (*Syzygium cumini* Linn)

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One form ethnoecology embraced for generations by the people of the Triwidadi's village, Pajangan, Bantul is the utilization of medicinal plant's forest resources such of "duwet" (*Syzygium cumini* Linn). Values and forms of local wisdom is less recognition and appreciation from the government, let alone used as a basis for consideration in the preparation of forest management policies in Java. As a pilot study, the study aims to construct ecological culture of local wisdom, Duwet used as one form of physical culture system of knowledge that institutionalized. Qualitative semi-quantitative research is focused on looking for a sociological explanation of the cultural knowledge systems and processes the use of duwet using cognitive ethnographic methods. Habitat of Duwet in natural forest, secondary forest, and garden-yard, describe the form of changes in environmental adaptation and social processes of forest resources used. The results showed that there is a symbolic interactionist of duwet utilization which are: constitution symbol, cognitive symbol, judgment symbol, and disclosure feeling symbol. In the construction of local knowledge processes the duwet utilization found six essential elements of ethnoecology, namely: local resources, local knowledge, local value, local skills, local solidarity groups, as well as mechanisms of local decision-making.

### Rooting the future; planting trees as a pathway to increased property values, wellbeing and resilience of rural Ethiopian households; evidence from a 20-year panel study.

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This study analyzes the inter-relationships between environment, wealth and food security using a unique 20-year panel data set. The Ethiopia Rural Household Survey collected detailed information on farm and natural resources management, wealth, household investments and wellbeing measures related to food security. The purpose of this study was to investigate the relationship between environment, wealth and wellbeing using a cross-lagged panel covariance design extended to a dynamic panel data model that includes fixed effects for location. The panel consists of 15 communities and 1477 households. This study specifically focuses on analyzing the effects of tree planting in the household parcel on wealth and well-being outcomes using a dynamic panel data model design combined with a counterfactual component.

The findings of this study suggest that tree planting greatly increases dwelling value, investments in the household and generally associated with asset building. Tree ownership is significantly associated with diet diversity indicating an association of trees also with short-term measures of wellbeing. Gender issues are examined and tree ownership significantly reduces the amount of time for collecting cooking fuel and related expenditures. Assets are commonly used as a proxy for wellbeing. This model, based on the panel data, is able to test for non-spurious and estimate the significance of causal relationships. Tree planting presents a significant causal effect on asset building and then

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to a wide range of wellbeing indicators including education attainment and nutritional indicators according to Chi-square measures. Shocks and coping mechanisms such as asking for emergency transfers are negatively correlated with tree ownership and dwelling value that indicates a resilience building effect from planting trees. Environmental assets such as trees and fiber crops are not included in typical wealth asset scales, neglecting a very significant source of income and sustainable asset development for poor farmers. For example the new Gates-funded World Bank LMS-ISA, Integrated Survey on Agriculture, panels include only fruit trees and completely neglect non-food agriculture such as timber and fiber producing activities. This study demonstrates the utility and importance of including permanent, tree and fiber crops in surveys that intend to understand the foundations of rural livelihoods to wellbeing and resilience.

### **Gender Relation Pattern on Private Forest Management at Banyumas and Banjarnegara District**

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Differences in access between males and females is one of causes of gender inequality. Its may eventually have an impact on the lack of control, benefit, and participation of females on farming activities. This research objectives to analyze the gender relation pattern on private forest management at Banyumas and Banjarnegara District in May to August 2012. Data gathering was carried out by ways of questionnaire, interview with farmer (males and females) and farmer groups with Socio Economic and Gender Analysis (SEAGA) instrument and Equity and Equality Index (IKKG). The results showed that acces and control of resource and cultivation activity is generally dominated of males (husband) such as: land, crops cultivated, education, training, extension services, capital, credit, equipment, nursery, fertilizing, cropping pattern, pest and disease control, meanwhile males are more dominant in pricing, post harvest processing, and marketing activity, and role undertaken jointly between males and females is access and control of information and maintenance. Quantitavely this condition shown by IKKG index less than 0,5.

### **Changes in livelihood of smallholders groups certified with FSC SLIMF**

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The SLIMF certification (Small or Low Intensity Managed Forest), created by the Forest Stewardship Council (FSC) for small producers, is applied and related to the farmer property's size, or the volume of timber harvested each year. In Brazil, group certification process became common, in order to make accessible to producers who do not have the

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financial means to fund the certification process individually. The authors conducted based interviews on "Sustainable Livelihood Approach" to identify differences between a FSC SLIMF non-certified group (NCG) and two certified groups, in southern Brazil (G1 and G2, with 24 and 8 months, respectively, since they obtained FSC certification). The sample comprised 30% of NCG and 21% of G1 and G2. There was no significant difference between the capitals of livelihoods among the groups (Tukey test, 5%). FSC SLIMF certification promoted improvements in G1 and G2 livelihoods, compared to NCG. For the social capital significant changes were not identified. However, there was a tendency of similarity between financial, human and natural capitals between G1 and G2. The authors conclude that the FSC SLIMF certification requires longer time (cycles) and that change is most perceived by producers directly linked to management.

### **Socio-Economic Factors of Woven Bamboo Enterprises and Bamboo Farmers in Utilizing Bamboo as Determinant Of Sustainable Bamboo Forest Management In Bangli District, Bali**

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Balinese community in Bangli District, Bali utilizes bamboo for woven bamboo handicraft in household scale industry. This paper examines the socio-economics factors of woven bamboo enterprises and bamboo farmers in utilizing bamboo as determinant of sustainable bamboo forest management. This is based on the hypothesis that the socio-economic factors influencing people in practicing sustainable forest management. Research data collected by observation and interview then we apply socio-economics descriptive analysis. The study reveals that socially Balinese women in Bangli have a hereditary tradition in bamboo weaving, so almost all women can weave bamboo and make this as livelihood. While the men work in agriculture and forest, most of them join farmer groups. Through training and sharing in group, farmers get knowledge in managing sustainable bamboo forest. The cultural factors, such as Tri Hita Kirana and Wariga, direct farmers to cutting bamboo in selective culms and days. In economics factors, the financial analysis shows that this business is profitable, the RC ratios at level of farmer, craft-women, and collector are above 1.00. The market demand of woven bamboo handicrafts is continuous for religious ceremony and souvenirs. It derives continuous demand of bamboo raw material, and then encourages farmers to maintain bamboo clumps and to do harvesting management by making a composition of age culms in grove and doing selective cutting based on age of culms. The proper harvesting management will produce sustain supply of bamboo.

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Sub-Theme:

## **Session 4.5. Challenges and Opportunities of Forestry Scholars in a Changing Forest Environment**

Chairperson(s): Efi Y. Yovi (Bogor Agricultural University)

### **Strategy to Improve Livelihood for Biodiversity Conservation in Forest Management Unit**

Harbi, J. (Forestry Department, Faculty of Agriculture, Muhammadiyah University of Palembang), Sidiq, M., Haasler, B. (Biodiversity and Climate Change (BIOCLIME), Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ))

Forest Resources is one of the basic capital for communities living around the Forest Management Unit (FMUs). Extraordinary management is required to provide earnings for the community while maintaining the sustainability of forest biodiversity. One of the options is to utilize non-timber forest product (NTFP) as source of livelihood. This research was conducted in Pangkalan Bulian Village, Musi Banyuasin District, South Sumatera Province. The Community Livelihood Appraisal and Product Scanning (CLAPS) method is used to describe the potential commodities, value chain and market analysis on downstream sector. Data were collected by in-depth interviews, focus group discussions, and snowball technique. Our research found that rattan is the priority NTFPs that could be further developed with the presence of abundant raw materials, trained human resources and potential whole market. Some actors involved in the value chain are collectors, local middleman, big collectors, small processors, big processors, retailers and end-customers. The profit margin earned on each value chain is around 25%. As conclusion, the strategy to improve local community livelihood using NTFP for biodiversity conservation is important to be distributed since this knowledge and/or actions is not largely implemented in the FMUs.

### **The Effect of Farmer Motivation to Community Forest Intensity**

Oktalina, S.N., Awang, S.A., Suryanto, P. (Faculty of Forestry, Gadjah Mada University, Indonesia)

The development of community forestry in Indonesia that also known as Trees Outside Forest (ToF) showed an increased role in the economic, social, cultural and environmental. Community forest management affected by the typology of biophysical, social, economic, cultural and global conditions. The community forest is evolving into an alternative model of forest management in the future because of the flexibility in its management and its sustainability. However, community forest management is highly dependent on the motivation of farmers in forest management.

Identification of the farmer motivation (economic, social and environmental) in managing community forests in Gunung Kidul Yogyakarta was done with scoring and then performed linear regression analysis to see its effect on the intensity of community forest

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management. The results showed that the farmers in Gunungkidul managing community forests for environmental motivation (score 81-88). Based on the results of the regression analyzes, significance value for the variable economic motivation (0.006) means that farmers who manages community forests with economic motivation will manage community forests more intensive compared to farmers with environmental and social motivation.

### **Empowering Forest Scholars to Empower Communities: A Case Study from the East Coast of New Zealand**

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Forests and forestry in many forms are instrumental in contributing positively to environmental, social and economic outcomes in New Zealand. However, simply increasing the production or production efficiency has not always realised positive benefits for communities. In a current project on the East Coast of New Zealand, we are experimenting with the development of adaptive governance capacity in forest communities that do not want more intense or increased forest production. The processes we are experimenting with are designed to understand land-use actors, their interests, networks and perceived challenges. Using this information, we will bring community members, organisations, industry and government together to develop new and innovative governance mechanisms. This work is innovative in that it has not been done before in New Zealand, can be scaled up and across contexts, and shift thinking away from traditional forest methods that have not worked. This paper will present the conceptual framework for this study, some preliminary results around actor interests and networks, as well as describe how empowering forest scholars to be able to conduct this research has worked towards empowering communities, and the challenges we have faced along the way.

### **Supporting Implementation of Sustainable Forest Management in Indonesia: An Ergonomics Approach**

Yovi EY (Department of Forest Management, Faculty of Forestry, Bogor Agricultural University, Indonesia). [eyyovi@apps.ipb.ac.id](mailto:eyyovi@apps.ipb.ac.id)

Sustainable forest management principle, criteria, and indicators have been clearly mentioned requirement on fulfillment of health and safety regulations, wages and work facilities standard for the workers. However, it is undeniable fact that unsafe and unhealthy working still being common practices in Indonesia, especially when the discussion is pointed to front line forestry worker involves in forest management activities. It is an occurrence that consideration to the worker's well being and their work performance still remains weak, eventough Indonesian government had been issued many regulation related to the occupational safety and health issues since last decades.

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Some make up actions on safety and health protection have been verified in several forest management units, those who declared themselves as SFM certified. Questions mark on worker's competency, occupational safety and health control by government, and safety management system have been dominated ergonomics research results. This situation reflects that safety programs remain only as manuals and slogans. This makes, in global scale, Indonesia laying below Malaysia, Thailand, and even South Africa in term of competitiveness and safety in 2005, and only slightly better than Zimbabwe. Series of researches proved that we are in emergency state toward (1) safety leadership, (2) integrated safety management system, and (3) workers involvement, all in macro and micro level. This paper summarized that intended human error (and not unintended human error) have caused high frequent work accident and diseases occurrence. The errors type found were rule-based mistakes, knowledge-based mistake, and skill-based mistakes. Therefore, strategy in enhancing the safety and health protection should be started from workers involvement (ergonomics participatory) by using risk based behavioral safety (RBBS) approach.

### **Transdisciplinary Approach in Controversial Forestry Issues: Challenges for Multistakeholders' Collaboration toward Sustainable Forest Management**

Fujiwara, T. (Institute of Decision Science for a Sustainable Society, Kyushu University, Japan), Yahara, T. (Faculty of Sciences, Kyushu University, Japan, Institute of Decision Science for a Sustainable Society, Kyushu University, Japan), Hyakumura, K. (Institute of Tropical Agriculture, Kyushu University, Japan, Institute of Decision Science for a Sustainable Society, Kyushu University, Japan)

Transdisciplinary approach, which adopt co-design, co-production, co-delivery with stakeholders, have been important in environment research for sustainable society. The International Council for Science indicates eight key stakeholders: (1) research institutes, (2) science-policy interfaces, (3) funders, (4) governments, (5) development organizations, (6) business and industries, (7) civil society, and (8) media. This paper discussed challenges for multistakeholders' collaborations toward sustainable forest management through case of industrial tree plantations (ITP) in Indonesia. ITPs are controversial forestry issues. ITPs are expected to meet growing timber demand, create employment opportunity, and contribute national economic development. Meanwhile, ITPs are strongly criticized for converting valuable natural forests and violating local people's rights. Literature research and informal interviews were conducted to understand the current situation of ITPs and various views of stakeholders on ITPs. The findings show two key challenges. Firstly, equitable land allocation among stakeholders remains a big challenge in forest policy in Indonesia (i.e., land grabbing issue). Secondly, confidence and interpretation of presented data is different by each stakeholders. Therefore, a procedure method of data presentation agreeable among stakeholders as independent, neutral, and fair is a significant challenge for their collaborations. Scientists can play an important role upon mediating conflicts and promoting collaborations among stakeholders.

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## Forester as agent of change and initiator on volunteering system toward environmental education and conservation of endangered species

Christita, M., Mayasari, A, Irawati D., Arini, Kinho, J., Halawane, J.E. (Environment and Forestry Research and Development Institute of Manado)

Forest degradation, losing biodiversity and consumerism is the problem to be faced by the forester. Environmental education and campaign of endangered species conservation is necessary to create the sustainable forest environment. Forester as an individual who has gained an education of conservation and sustainable forest management has a role as an initiator toward environmental education and endangered species conservation through volunteering activities. Volunteering is the key to changing the peoples' perception of forest and species endangered conservation. Anoa Breeding Centre conduct by Environment and Forestry Research and Development Institute of Manado has been initiating the volunteering activities for foresters (forestry scholars or/and related field study in nature sciences) to involve directly into the Environmental education and introducing Anoa as endangered and endemic species to Sulawesi. Volunteer working together with researchers takes responsibilities as the changing agent of the mindset of consumerism in forest product and endangered wildlife. Volunteer directly participates to the ex-situ conservation of anoa at Anoa Breeding Centre through school outreach, and management of the breeding centre. The existence of foresters as volunteer in conservation efforts have opened up the idea that conservation and environmental education is public responsibility. Volunteering is an evidence of the forestry scholars responsibility in creating a sustainable forest environment.

Sub-Theme:

### **Session 4.6. Exploring the interface between local people and industrial plantations in South- East Asia.**

Chairperson(s): Romain Pirard

#### **Perceptions of Local Populations toward Industrial Timber Plantations across Sumatra, Kalimantan and Java**

Pirard, R (CIFOR)

We argue that it matters to investigate rural populations' perceptions toward industrial timber plantations in a comprehensive way in order to distinguish between plantation types and make informed recommendations for improved management in terms of local impacts.

Two methods were applied to investigate rural populations' perceptions toward industrial timber plantations in Indonesia. One is the Q-method that shows three different viewpoints in one acacia plantation site, respectively the enthusiasts (including over the provision of environmental services), those fully dissatisfied by the plantation,

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and those dissatisfied specifically about the plantation as an obstacle to local economic development.

The other method is an extensive household survey over 9 sites, three islands and three plantations types with 606 respondents. Results show that pine and teak plantations tend to differ from pulpwood plantations on several dimensions: more benefits and services, opportunities and better environmental record. Populations living around acacia plantations are more focused on local development and infrastructures: while they feel frustrated with past achievements, they also have expectations for the companies to open up these usually remote areas.

The analysis leads to several suggestions. The respective roles of the state and the companies for local development should be clarified, local intermediary institutions should be created to channel people's concerns, and more attention should be paid to the organization of the labor force.

### **The Role of Mediation in Resolving Land Conflicts in Indonesia's Industrial Plantations: Political Economy Perspective**

Dhiaulhaq, A. (Student at Australian National University (ANU))

Conflicts and controversies have been prominent features of the expansion of industrial oil palm and pulpwood plantations in Indonesia. Despite the recent reforms of resource governance, effective mechanism to resolve land conflicts comprehensively, decisively and fairly are still lacking in the country. As a result, many plantation conflicts between communities and companies have continued for years or even decades. This highlights the urgency of finding effective ways to address the problem.

Mediation by a third-party entity has been increasingly used in the last decades to resolve conflicts in Indonesia's oil palm and pulpwood plantations as an alternative to more traditional legal court mechanisms. This trend highlights the need to assess the effectiveness of the third party mediation as an appropriate tool to solve the problem, and to identify the gaps and challenges. The cross-scale political, institutional and power dynamics underpinning the processes and outcomes of conflict resolution are still rarely analysed in conceptual terms and research is therefore needed to explain the prevailing socio-political conditions generating and constraining positive conflict outcomes.

Using a political economy perspective, this paper draws on policy and comparative analysis of case studies in Sumatra and Kalimantan to assess current mediation efforts. The study asks to what extent do the social, economic and political dynamics at local, national, global levels shape the process of conflict resolution, as well as their outcomes. A comprehensive understanding of this issue is considered important to inform an evidence base geared towards identifying sound and robust conflict resolution strategies in the interest of people and of economic development, and to create long-term constructive relationships among key stakeholders.

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## Corporate Social Responsibility and Timber Plantation Development in Indonesia

Wahyudiyati, K.T. (Centre for Social, Economy, Policy and Climate Change Research and Development)

The relationship between a forestry company and the communities living close to its operations can be problematic, and economic factors are often cited as a major cause of friction. Corporate social responsibility (CSR) has been applied in Indonesia in recent years with a focus on contractual partnerships between companies and tree growers. Yet most of these partnerships deal with the cultivation of one given species, and poorly address the wider relationship with local communities.

This situation has prompted the Indonesian government to embed the concept of CSR in legislation to increase the benefits from forestry development to communities. We undertook an analysis of existing CSR legislation to assess its effectiveness, and completed in-depth interviews to capture the perspectives of key stakeholders. Research sites included 5 villages in two sub-districts of South Kalimantan. Results indicate that the common understanding of CSR by staff of the forestry companies is often narrow with securing timber supplies as its primary goal. Companies usually fail to truly appreciate how strategic can CSR be for the company to forge stronger relationships with 'affected' stakeholders.

### Effects of Industrial Plantations on Ecosystem Services and Livelihoods: Perspectives of Rural Communities in China

D'Amato, D., Rekola, M., Cai, D., Toppinen, A. (Department of Forest Sciences, University of Helsinki), Wan, M. (School of Foreign Languages, Jiangxi University of Finance and Economics)

This paper addresses the current research void on local community views of changes in ecosystem services associated with rapid land use transformation in the context of plantation-based forestry. This interview-based study, conducted in southern China, aims at assessing the perspectives of local communities of: 1) the effects of *Eucalyptus* industrial plantations on selected ecosystem services and on local development, and 2) opportunities for future community livelihood development, based on the relations with the government and with forest industry operating locally. We analysed data from semi-structured interviews with 70 villagers for their views on changes in ecosystem services after the establishment of plantations, and their future expectations on the local livelihood development. Most interviewees mentioned some negative development on environmental quality after the establishment of the industrial plantations, especially on soil and water. Furthermore, the reduced productivity of cropland surrounding industrial plantations, coupled with other financial drivers, induced several villagers to switch from agricultural crops to household plantations. In the absence of destructive typhoons, household plantations can provide owners more free time, higher income, while industrial plantations provided some employment opportunities. Interviewees' expectations for the future included receiving financial

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support and capacity building for household plantations and crops, support to local roads and schools, and higher employment opportunities. Some interviewees suggested that solutions should be implemented for improving degraded water quality, while others suggested reducing forestry operations. Even though being highly context-specific, our findings open up the discussion about the further community development opportunities in the context of plantation forestry. In particular, the potential of value sharing mechanisms between the private sector and the local communities should be further studied.

### **Socioeconomic Impacts of Large-Scale Tree Plantations on Local Communities. *Examining the Empirical Evidence.***

Malkamäki, A., D'Amato, D., Hogarth, N.J., Toppinen, A. (University of Helsinki), Kanninen, M. (University of Helsinki, Center for International Forestry Research), Pirard, R., Zhou, W. (Center for International Forestry Research)

To meet the notable increase in demand of industrial round wood, area of large-scale tree plantations has increased during the last decades. This has raised controversy on the long-term sustainability, and impacts on ecosystem services and local livelihoods. Thus, our plan to carry out a systematic review on the impacts of plantations on local communities is both timely and necessary. We aim to review the direct and indirect impact pathways, and identify bias and gaps in evidence that currently remains scattered. We search all relevant case studies from scholarly databases and selected organizational sources. Following screening and quality assessment, resulting database consists of 35 individual studies that are synthesized descriptively. To estimate overall effects, synthesis is complemented statistically with meta-analyses. Preliminary results show that most expected local benefits of plantations are still awaited, but the evidence is mixed and skewed to locations with prior land use conflicts. Recent evidence signals of livelihood diversification and improved resilience. We conclude by encouraging efforts to manage plantations by engaging a wide range of stakeholders. To succeed, actors' expectations must be fairly balanced, suitable sustainability indicators are required, and terms of collaboration cannot be overly conditional or dictated by short-term economic or political interests.

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## FOREST LAND USE, ASSESSMENTS AND CERTIFICATION SCHEMES

Sub-Theme:

### Session 5.1. REDD+ Performance Assessments

Chairperson(s): Maria Brockhaus, Monica diGregorio

#### Assessing How Results-Based Payment Approach Can Incentivize Effective, Efficient and Equitable REDD+ Outcomes

Wong, G., Angelsen, A., Brockhaus, M., Carmenta, R., Duchelle, A., Leonard, S., Luttrell, C., Martius, C., Wunder, S (CIFOR)

Results-based finance for the “implementation of policies and positive incentives” for REDD+ is a cornerstone in the Paris Climate Agreement (Article 5). REDD+ finance (or the lack thereof) has dominated debates at all levels, from the local project level to national policy implementation to global negotiation. With the increased commitment to finance in the post-Paris period, there has been much discussion on how REDD+ governance and commitments are unfolding at both global and national levels (see for example, <http://www.berlinconference.org/>).

We identify several key issues relating to results-based payments for REDD+, including challenges in: 1) defining and measuring of performance in REDD+ across the different phases of REDD+ implementation, 2) structuring finance to effectively incentivize REDD+ performance, and 3) integrating non-carbon benefits within a results based payment mechanism. This paper draws on evidence from CIFOR’s REDD+ research and lessons derived from other sectors and non-REDD+ initiatives to provide insights into these challenges and to inform the operationalization of results-based financing for effective, efficient and equitable REDD+ outcomes.

#### REDD+ Performance Enabling Conditions and Stumbling Blocks: Qualitative Comparative Analysis, Experiences of 15 Countries

Korhonen-Kurki, K.(CIFOR, Helsinki University), Brockhaus, M., Sehring, J., Babon, A., Gebara, M.F., Kambire, H., Kengoum, F., Moeliono, M., Muharrom, E., Maharani, C., Pham, T.T., Resosudarmo, I.A.P., Zida, M., O’Chien, R., (CIFOR), Di Gregorio, M. (CIFOR, University of Leeds), Assembe-Mvondo, S. (Central Africa Forest Commission (CAFI) BP 20818 Yaounde Cameroon), Bekele, M. (Wondo Genet College of Forestry and Natural Resources, Hawassa University), Kahtri, D.B., Paudel, N.S. (Forest Action Nepal), Menton, M. (Solutions & Evidence for Environment & Development (SEED)), Siteo, S. (Center for Agriculture and Natural Resource Studies (CEAGRE), Faculty of Agronomy and Forestry, Eduardo Mondlane University), Benn, V. (Iwokrama 77 High Street Kingston, Georgetown, Guyana), Dkamela, G.P. (Department of Sociology, University of Cape Town)

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Reducing emissions from deforestation and forest degradation (REDD+) has been reconfirmed in the Paris agreement as a climate change mitigation mechanism in developing countries. This paper presents findings from a long-term comparative analysis of the national political context and progress with effective, efficient and equitable REDD+ in 15 countries. Based on repeated expert assessments in 2012, 2014 and now in 2016, analysis is undertaken in order to identify the enabling conditions for achieving progress with the implementation of countries' REDD+ policies and measures. Earlier analysis indicated the need to review the overall set of conditions because the REDD+ policy arena, at international and at country levels, is highly dynamic and undergoes constant evolution, with a growing emphasis on performance elements as REDD+ is moving towards results based payments. Earlier findings already highlighted the importance of factors such as already initiated policy change, the availability of performance based funds, and the presence of coalitions calling for broader policy change. New conditions such as forest tenure, diffusion of REDD+ policies across near geographical area, political leadership and state autonomy vis-à-vis powerful drivers of deforestation will be examined. The study will be highly relevant for a variety of actors, as information on enabling conditions is needed for those aiming to deliver REDD+ but also to finance and to identify incentive mechanisms that in particular contexts can help to deliver efficient, effective, and equitable outcomes.

### **Multilevel Governance Challenges Of Altering Land Use Change Trajectories: Technical Solutions to Political Problems in REDD+ and Non-REDD+ Land Use Changes**

Myers R., Larson A. M., Ravikumar A (CIFOR)

Understanding the politics of land use change is challenging in part because there are so many different actors and interests involved. Yet, it is imperative (especially as REDD+ moves to implementation) to understand how these different actors work together – or in opposition – to produce land use changes. We conducted over 700 interviews with actors in Indonesia, Vietnam, Peru, Tanzania and Mexico. We asked: (1) Across levels and sectors, how and why are land use decisions made? (2) Are investments and interventions in reducing carbon emissions leading to changes in land use decisions, and if not, why? and (3) What are the challenges to and opportunities for bringing about transformational change?

This presentation focusses on research in Indonesia and draws comparisons to our findings in other countries with particular reference to REDD+. We found that (1) despite diverse legal systems and varying levels of decentralisation, powerful actors with a stake in deforestation seemed to find ways to benefit disproportionately to other actors, (2) there are institutional and political barriers to change in land use trajectories that render technical solutions inadequate to curtail 'undesirable' land use changes, and (3) regardless of the strengths or weaknesses of safeguards and policies, the proclivities of individuals played a significant role on how policies were, or were not implemented, leading to varying extents of processes and outcome legitimacy.

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## The Process of REDD+ policy making in Indonesia: REDD+ as Transformational Change or a Media for Change

Moeliono, M., Muharrom, E., Brockhaus, M., Satrio, B.D. and Maharani C. (CIFOR)

REDD+ has been accepted by Indonesia as a mechanism to combat deforestation and forest degradation, yet in the process of developing REDD+, it has revealed the very difficulties of land use, forest governance, tenure, and indigenous people hindering implementation of forest governance. With the introduction of REDD+ in 2007, the government endorsed the largest bilateral agreement on forest governance, established an independent REDD+ agency, sound financial instrument, safeguards mechanisms, and a REDD+ National Strategy. Changes in government introduced by the new government in 2014 changed the direction of the REDD+ policy processes as well as the constellation of involved actors and their relations.

A longitudinal study conducted by CIFOR comparing policy processes in 2012 and 2015 identified these changes and highlighted how the influence of some actors, a.o. the Alliance of Customary Communities (AMAN) changed over time (and IPB) to become more important and central in the actor network.

In this paper we analyze changes in the relation among the actors between 2012 and 2014 and its significance to the REDD+ policy process as compared to the actor's own agenda. Though Business as Usual remains and no transformational change has occurred, the REDD+ processes provided opportunities for other policy changes.

### Policies Influencing the Performance of REDD+ in Indonesia

Ekawati S, Subarudi, Budiningsih K, Kartikasari G (Ministry of Environment and Forestry), Tacconi L. (Australian National University) and Muhammad Zahrul Muttaqin (Ministry of Environment and Forestry). ekawati69@yahoo.com, rudi.subarudi@yahoo.co.id

According to National REDD+ Strategy, Indonesia is expected to enter the implementing phase of REDD in 2015. However, the development of REDD+ looks stagnant. Some technical and regulatory documents have been prepared within the framework of a national REDD+ architecture, but the REDD+ program has not shown a significant progress. Research conducted in three provinces comprising Papua, Central Kalimantan and Riau is intended to analyse the policy structures and the behavior of actors in the forestry sector and outside the forestry sector affecting the performance of REDD+ in Indonesia. The results show that the structures of the existing policies in Indonesia mostly support the implementation of REDD+, but there are some regulations hampering the implementation of REDD+, including mining in protection forests, tariffs for non-tax state revenue in mining is relatively cheap, and forest conversion for plantations. The legitimacy of documents and regulations are still considered weak and not able to support the operation of REDD+ in Indonesia. Thus, although the performance of deforestation and

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emission levels have decreased, but Indonesia is not yet fully ready to enter into the implementation phase of REDD+ based on the readiness that is measured from the availability of document, the legality and legitimacy of each component in the architecture of Indonesian REDD+.

### Developing Community-Based Carbon and Biodiversity Monitoring in Papua

Rahayu S. and Dewi S. (World Agroforestry Centre)

Community members in East Kalimantan can reliably and cost-effectively monitoring aboveground forest biomass after received series of training. There is no significant different result between experienced and inexperienced community members. REDD+ program require repeated surveys of biomass over extended time frames and rely on accurate forest carbon monitoring. Duplication of community-based carbon monitoring scheme is needed, moreover in the remote area with high cost to scientist-based monitoring. This program aim are: (1) to give awareness to local community on the importance of trees as source of carbon and other uses, and (2) to strengthen local community capacity on carbon and biodiversity monitoring. Developing community-based conducted in three districts of Papua, they are Jayapura, Jayawijaya and Merauke through training of trainer scheme. Working group at district level who consist of local government officers and community leaders participate in the training, then they change the role as trainer for local community. Developing principle, criteria and indicator of carbon and biodiversity monitoring through focus group discussion is part of the training beside field work practices. Basically, both of working group at district level and local community can do carbon and biodiversity monitoring, but the accurate of the data need to be tested.

### Strengthening the Right and Access Tenure of Forest Land of Indigenous Communities in the Seram Western District of Maluku

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Forest land tenure by indigenous people often cannot provide the clarity and formally access rights, so that the various parties views the uncertainty in the sustainability of forest management. The purpose of this study is the strengthening of indigenous people to express the clarity of rights and access to forest land tenure. This purpose use the descriptive qualitative approach to PAR (Participatory Action Research) by the way of constructing meaning together between researchers and societies to produce a defined knowledge of the issue. The results showed that the form of control over indigenous lands are divided into three namely mastery as a unity of indigenous peoples over their traditional territories (*petuanan*), the control by the clan (*soa*) and control by individual (family). Facilitation process researchers refer to the concept of experts, to produce a

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learning process as people realize there are many rights it would have on the land, but access is little benefit obtained because people recognize that there is an open space for social relations that makes people who do not have the right but got access to the benefits of community-owned land was the use by outsiders and people's reliance on outside parties to improve the utilization of the land.

**Sub-Theme:**

### **Session 5.2. Identifying priorities for impact-oriented forest policy research in tropical countries**

Chairperson(s): Luca Tacconi (Australian National University)

#### **Gender, Migration and Forest Governance: Rethinking Community Forestry Policies in Nepal**

Basnett, B.S. (Center for International Forestry Research)

The policy literature surrounding the governance of community forests in the middle hills of Nepal has changed and grown substantially. From a focus on promoting the effective participation of local communities in sustainable forest management in the 1970s and 1980s, the major actors involved in community forestry have been making concerted efforts to mainstream gender and social inclusion in community forestry policies and institutions. While these are important and commendable developments and reflect a growing momentum for inclusive change, in this presentation I will argue that community forestry policy literature still frames 'gender', 'caste', 'ethnicity' as static social relations, and women, peoples of low castes, and ethnic minorities as uniformly marginalized. Moreover, individuals and communities in rural areas are still assumed to be spatially bounded, tied to their location of residence, and their relationship to forest products remains unproblematized. The latter is of concern in light of the importance of migration, both historically and in the recent past, for rural livelihoods throughout the country.

#### **Land-Use Change, Its Underlying Causes and Impact on Mountainous Forests in Eastern Myanmar**

Phyu Lwin, P., Kanzaki, M. (Graduate School of Agriculture, Kyoto University)

Some of shifting cultivated areas usually practiced by hill dwellers changed to sedentary farmlands nowadays in Myanmar. We examined the process of conversion from shifting cultivation sites to tea gardens in hilly region, its underlying causes and impact of the conversion on forests in eastern Myanmar. Village surveys, documents screening and remote sensing were mainly applied. About 91.47% of shifting cultivated areas including fallows in 1988 was transformed to permanent tea gardens in 2016. Because of the

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dynamic nature of shifting cultivation, those areas are usually excluded in any land titles under laws and legislations issued in land-use but tea gardens are titled as farmland under Myanmar Farmland Law that local people can receive land-use certificate to establish gardens as long as there is no breach of the stipulated terms and conditions. Lack of legalization to secure land tenure to practice shifting cultivation and earning higher income from tea gardens could have changed land-use pattern. Annual net deforestation rate of 0.68% was observed while that of forest degradation was found as 0.28% during 28 years. The conversion to sedentary farmlands resulted in the permanent disappearance of forested areas and increased demand on fuelwood for tea leaf processing tended to degrade the remaining forests.

### **Addressing Equity Concerns in Forested Watershed Catchment Treatment Projects in Telangana, India**

Chandrappagari, S. (Member Secretary, Telangana State Biodiversity Board Hyderabad, India)

Watershed projects have been playing a major role in addressing natural resource management issues in arid and semi-arid regions of India. Seven out of 10 districts of Telangana have significant number of watershed projects being implemented through Government of India sponsored integrated watershed management program. At least 30 percent of these projects have sizeable forest area owned by the forest and revenue departments forming the upper catchment of the watersheds followed by marginalized communities owned crop land. Two key problems existing were, most of the watershed project investment had gone to the rich since the rich and medium level farmers could contribute their part to earn the subsidies while the marginalized poor remained passive and depended more and more on the forests for their livelihoods, thus playing an indirect role in degradation of the forests. Another glaring gap was that women hardly played any decisive role in watershed project implementation. This paper throws light on how watershed program provided institutional support through effective convergence strategies to strengthen the community based organizations and enhance capacity building of the communities through women self-help groups and their networks for addressing the equity concerns in forested watershed projects.

### **Levelling Up the Forest Collaborative Management in Indonesia**

Desmiwati (Ministry of Environmental and Forestry), Christian, Y. (Bogor Agricultural University)

The recurrence of forestry-related conflict in Indonesia need urgent breakthrough for solution, much less after the failure of the regional autonomy in protecting forest. The failure rooted on the unequal the power relation and the applied discourse in governing the forest area, therefore what is called “collaboration” only exist on the surface instead of

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more substantive as should be. The ongoing narration shows that the management of forest resources became the arena of contestation, not for collaboration. Bureaucracy rises with policy and legal narration, private corporation rises with growth and welfare narration, community rises with resistance and exclusion narration, and the *free riders* rises with distribution of prosperity narration. The respective narration is diametrically negating each other and compete to dominate resulting the “legal not legitimate” and “illegal but authentic” on the other side. Starting with that issue, the concept and scheme of *Collaborative Management’s* effectiveness should levelled up through devolutive based on local-user in the polycentric system. The three steps of the policy development are: 1) the collective narration formulation based on knowledge and local multistakeholders discourse, 2) the creation of local actors web as authentic resource users, and 3) institutionalisation of forest resource and the local resource mobilisation.

### **Assessing the Effectiveness of Community-Based Mangrove Management: Study Case in Jangkaran Village, Kulon Progo Regency, Indonesia**

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The application of co-management seems quite promising in the forestry sectors especially in the mangrove forest governance (Datta, Chattopadhyay & Guha 2012; On-prom 2014). It inspiring “Wana Tirta”, a local mangrove conservation group in Kulon Progo Regency, Indonesia, with the continuously support from “Damar”, a local NGO, to increase its restoration efforts. However, the reality is not as good as the concept since the progress of newly planted mangroves survival, their main performance indicator, is still low (KKMSP 2012; Sawitri 2012). Previously studies blamed the quality of individual rather than the governance (Sawitri 2012). Thus, this research tries to fill that gap by focus on the governance quality especially on the relationship between the key actors to increase the quality of existing co-management application. The information is obtained by using semi-structured interviews from several key actors of local mangrove governance, from July to August 2016, and analysed using thematic content analysis (Burnard 1991). The hypothesis of the research is the synchronisation perception among the actors is the most important factor to upgrade the quality of co-management application. This simple concept seems very challenging in the application and might lead to the further scholars’ interest.

## Transformative Power of Alternative Discourses in Forest Governance: The Role of Adat in Indonesia

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This article focuses on the struggle of indigenous and tribal peoples in Indonesia. The question guiding the research is under which conditions the practices indigenous and tribal people utilize have the highest level of transformative power in relation to dominant discourses on forest governance in Indonesia? In order to examine dominant discourses on forest governance in Indonesia as well as by which practices indigenous and tribal people get to transform them, I employ discourse analysis and practice based approach from post-structuralist perspective. Secondly, I will investigate counter practices of indigenous and tribal peoples in five different localities for comparative research. Each province in Indonesia has a distinct political and cultural context, as well as in each area indigenous marginalized people use different strategies. Namely, the research is based in the villages and jungles of Aceh, Borneo, Sumatra, Central Java and Bali. The discussion chapter examines conditions under which particular practices got to be more successful than others and why. In other words the article aims to provide explanation for variation in the level of transformative power of practices indigenous peoples utilize in order to change dominant discourses on forest management in Indonesia.

Sub-Theme:

### Session 5.3. Contestation of Different Forest and Plantation Certification Schemes

Chairperson(s): M. Alif K. Sahide (University of Makassar), Agung Wibowo (University of Palangkaraya)

#### Mapping of Stakeholders in the Private Owned Forest Management

Fauziyah, E., and Kuswanto, D.P. (Agroforestry Technology Research and Development Agency)

Stakeholders have interests and can bring influence in the development of private owned forest. This study aimed to analyzed stakeholder its role in the development of private owned forest. The study was located in three regencies, Banjarnegara, Banyumas, and Pacitan started from June 2013 to June 2014. The informations were collected through stakeholder inventory with the snowball method, discussions and interviews and analyzed descriptively. The results showed that stakeholders with the main task were directly related to the people's forests had more attention than the other supporting stakeholders. Stakeholders with a high level of importance, but low level of influence

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(subject) in Banjarnegara Regency were village officials, merchants, Agriculture Agency, Perum Perhutani, and Food Security Office, in Banyumas Regency: village officials, merchants, and the Environment Agency, while in Pacitan Regency were village officials, merchants, Agriculture Agency and NGOs. Stakeholders with a degree of influence and interests that equally high (players) were Forestry Agency, Planning Agency, and Extension Agency. Stakeholders with a low level of influence and level interest rate (bystanders) in were research institutions, universities and agencies with the task related to food and the environment. Forestry agency played an important role which acts as the execution and coordination.

### **From Voluntary Private to Mandatory State Governance in Indonesian Forest Certification: Reclaiming Authority by Bureaucracies**

Wibowo, A. (Department of Forestry, University of Palangka Raya), Sahide, M.A.K. (Laboratory on Forest Policy and Entrepreneurship, University of Hasanuddin), Giessen, L. (Chair Group of Forest and Nature Conservation Policy, Georg-August-Universität Göttingen)

Abstract Forest certification has been introduced by non-state actors as a voluntary and market-based instrument addressing forest problems, which state policies failed to resolve. Lately, however, state-driven forest-related certification schemes can be observed, e.g. in Indonesia, through the EU FLEGT-VPA negotiation process. It is argued, specific state agencies in a struggle for power and authority develop mandatory certification schemes which are directly competing with private ones. Before this background, the aims of this study are (i) describing the current trend from voluntary private to mandatory state certification schemes in Indonesia, (ii) mapping the main actors involved in certification politics, and (iii) explaining this trend with the interests of the main actors. The results confirm a trend from voluntary private to mandatory state-driven certification of forest management. The Ministry of Forestry, the Ministry of Trade, the Ministry of Industry, wood producer and processing associations, European Union, local funding organizations, environmental organizations, certification bodies and international buyers are detected as the main coalitions and actors in the certification politics. The stronger coalition develops a mandatory-timber legality verification system as strategies to counter their voluntary private competitor schemes.

### **Cooperation Model for Sustainable Forest Management Certification Implementation in Indonesia**

Wibawa, H., Respati, D.D. (Lembaga Ekolabel Indonesia)

Based on ITTO (*International Tropical Timber Organization*) member's country conference on May 1990, the tropical timber trade must be originated from sustainable forest in 2000. Voluntary certification initiative is progressive on international and national

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level, there are Forest Stewardship Council (FSC) and *Lembaga Ekolabel Indonesia* (LEI). Those organizations promote the Sustainable Forest Management (SFM) through certification system development and implementation. Standard difference arises complication for forest management unit in Indonesia, particularly in preparation, standard compliance and international market acceptance level. Although they are competitor, LEI with FSC signed *Joint Certification Protocol* (JCP) in 1996 to make two systems implementation easier for forest management unit in Indonesia. Since March 2012, LEI-FSC are collaborated through *Standard Development Group* (SDG). SDG harmonizing two systems to produce a proper national standard on SFM in Indonesia that comply to Indonesia mandatory certification system. Resulted standard can be used by FSC and LEI based on their own procedure. Through standard harmonization, the recognition of two systems will arise. LEI will implement certification system equally with international standard and FSC will have suitable national standard on Indonesia socio-cultural. Coopetition model becomes an option to expand market share and implement sustainable forest certification, both mandatory and voluntary.

### Timber Legality, Certification and Brexit

Purnomo, H. (Center for International Forestry Research (CIFOR), Faculty of Forestry, Bogor Agricultural University) and Achdiawan, R. (Center for International Forestry Research (CIFOR))

Sustainability and Legality are the main concerns in managing forest and timber products in developing countries such as Indonesia. Indonesia's production forest is amounting to 69 million ha, in which 34 million ha of forest concessions produce 8 million m<sup>3</sup> timber from natural forest and 38 million m<sup>3</sup> timber from planted forest. The article 33(4) of 1945 Indonesia's constitution has clearly mandated Indonesia to manage forest and natural resources sustainably. However, after 20 years of certification processes, Indonesia is only having five million ha (7%) of certified production forest under the schemes of Forest Stewardship Council (FSC), Eco-labelling Institute (LEI) and Program for Endorsement Forest Certification (PEFC). While the contestation among these voluntary schemes exists, they together have not played expressively in sustaining Indonesia's forest. As a result, the government based Timber Legality Assurance System (SVLK) was introduced a decade ago as a mandatory system to reduce illegal logging. This system was a result from Forest Law Enforcement, Governance and Trade-Voluntary Partnership Agreement (FLEGT-VPA) with European Union. Currently 4.6 million ha of concessions, 0.5 million ha of community forest and 1,908 timber industries have been SVLK certified. President Joko Widodo met President European Commission Jean-Claude Juncker in Brussels on April 21<sup>st</sup>, 2016 to agree on the pathway of FLEGT licensing for Indonesia's timber.

Great Britain or United Kingdom (UK) has been the main sponsor of SVLK initiative through its multi-stakeholder forestry program that significantly influence SVLK conceptual design, implementation as well as its main actors and supporters in Indonesia. Therefore, when the Brexit (Britain Exit) referendum on June 24<sup>th</sup>, 2016 resulted UK exit from EU, the

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doubt for EU FLEGT licensing process appears among SVLK stakeholders. This paper describes the likely impacts of Brexit to SVLK and voluntary certification schemes in Indonesia. With 10.1 million ha forest certified under SVLK and voluntary schemes, the paper explains plausible scenarios to sustain and enlarge them. Indeed, UK is also sponsoring many developing countries for timber legality action. The lesson learned from Indonesian timber sector is highly applicable for countries such as ASEAN country members, Democratic Republic of Congo and Papua New Guinea. These countries are struggling to improve their performance for entering markets under *EU Timber Regulation*, *US Lacey Act*, *Australian Illegal Logging Prohibition* and Japanese *Green Konyuho/Goho Wood*.

Sub Themes:

#### **Session 5.4. Sustainable Forest Management Governance Standards: Economic and Policy**

Chairperson(s): Tim Cadman (Griffith University)

##### **Governance Values in the Climate Change Regime: Stakeholder Perceptions Of REDD+ Legitimacy at the National Level**

Cadman, T. (Institute for Ethics, Governance and Law, Griffith University), Maraseni, T. (Australian Centre for Sustainable Business and Development, University of Southern Queensland), Hugh Breakey (Institute for Ethics, Governance and Law, Griffith University)

This paper presents the results of two national-level studies of REDD+ governance values in Nepal and Papua New Guinea (PNG), using a hierarchical framework of principles, criteria and indicators (PC&I), with evaluation at the indicator level. The research was conducted by means of an online survey and face-to-face interviews to determine general perspectives on the governance quality of REDD+, as well as stakeholder workshops, in which participants were asked to rank all 11 indicators on the basis of perceived national significance. In both countries the four governance values were inclusiveness, resources, accountability and transparency, but their relative importance differed between countries. The findings suggest that while a generic set of governance values may be universally applied for determining the institutional legitimacy of REDD+, their relative importance is different. This leads to the conclusion that it may not be appropriate to use a 'thin' (i.e. reduced) set of values for REDD+ for perceived efficiency purposes, given different national priorities and contexts. .

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## Improving Community Forest Governance Through Implementation of Community-based Forest Management Standard and Timber Legality Assurance System in Indonesia

Purbawiyatna, A., Tjawikrama, D. (Lembaga Ekolabel Indonesia)

Community forests in Indonesia, especially in Java provinces, have been rapidly emerged in the last decade. This forest characterized by less intensive management, plant as family savings, and planted at narrow privately owned land. The private forest owners gathered and establish a community forest management unit managing the forest according to the management rules developed and agreed by themselves. Wood production from community forest significantly contribute to the national raw material for furniture and handicraft industries. However, community forest facing challenges in implementing sustainable forest management (SFM) principles as well as in institutional arrangement. This weakness hindering access to a wider market for higher economic benefits. There are two efforts can be considered have been attempting to improve its governance and management practices to overcome the above obstacles which are promotion of voluntary certification standards for community-based forest management (PHBML LEI) and the implementation of government policies on timber legality verification system (SVLK). A descriptive analysis showed that implementation of SFM principles of PHBML-LEI and SVLK have positive impact on the improvement of governance and forest management practices of community forest to ensure its sustainability and increase economic benefits through increased market access for timber products of community forest.

### Livelihood System of Smallholding Forest Farmers and the Dilemma of Timber Certification

Dharmawan, A.H., Mardiyarningsih, D.I., Putri, E.I.K, Wianti, N.I. (Bogor Agricultural University, Indonesia)

Timber Legality Assurance System (TLAS) is an environmental governance approach to overcome illegal logging. TLAS policy is presence as SVLK certification targeted to achieve sustainable forest management and to increase economic welfare of people dealing with timber business in Indonesia. The implementation of SVLK brings about variety of changes especially at smallholding forest farmers level. They are typically poor, occupying small size of land, making a living by diversifying livelihood sources. Forest production is not run under business principles for profit but part of survival to coping with economic emergency situation. Under such a condition, SVLK is not easily implemented due to high cost of certification. SVLK does not really give economic incentive to the smallholding forests. SVLK does not help reduce rural poverty significantly. This article is drawn from case studies that tried to analyze the dilemma of certification in some of smallholding forests regions in Indonesia.

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Indonesia's natural forest has been persistently declining, even with the fastest rate in the world, regardless of various efforts to stop the decline or at least to reduce the rate significantly. At the same time, development of plantation forest has been very slow. Various causes of the natural forest loss have been identified but financial non-profitability. The very fundamental reason why natural forests allocated for timber production purpose will not survive is that utilization of natural forest is financially not profitable in the long term. In order for business to stay in the business of the natural production forests, the government should provide financial incentives using public's money. Hence, the government needs supports and approval from the people. However, bad implementation of the forestry laws makes support from the general public and other sectors to forestry very weak. Moreover, three policy instruments, namely fees and royalties, export ban, and certification that have failed to deliver sustainable natural production forests are discussed. Furthermore, a more appropriate formulation of natural forest utilization is basically not as a sustainable forest management but as an optimal timber mining requiring a different set of policies.

Sub-Theme:

### **Session 5.5. Assessing Conformity of Forest Management Practices and Conservation Policy**

Chairperson(s): Herry Purnomo (Bogor Agricultural University, CIFOR)

#### **Protecting or Destructing? Forest Management versus Nature Conservation in Lithuanian Forestry**

Brukas, V. (Southern Swedish Forest Research Centre, Swedish University of Agricultural Sciences), Stanislovaitis, A. And Kavaliauskas, M. (Institute of Forest Management and Wood Science, Aleksandras Stulginkis University), Gaižutis, A. (Vilnius University, Marketing Department).

As in many other countries, nature conservation policy has been considerably strengthened during last 2-3 decades in Lithuania. Characteristically for the Central and Eastern European region, the main instrument in this regard is forestland zoning, aiming at implementing multiple use forestry at landscape level. This study scrutinizes the attitudes towards nature conservation, based on qualitative interviews of Lithuanian private forest owners, state forest managers, forest management planners and other local stakeholders. Most of the interviewed forest managers and owners are compliant with the legal demands, however, their judgment of natural conservation appears to be strongly affected by the degree of the faced restrictions. The interviews expose several examples nature conservation measures that are poorly adapted to the local realities of forest management. Hastily performed zoning entails numerous mistakes when forest or landscape characteristics do not match the intended purpose, cohorts of unfortunate

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forest owners face unjust treatment without receiving any compensations. Even more critically, severe forest management restrictions around the nests of rare birds lead to widespread destructions of nests in private forests. There is clear need for a radically improved consideration of local specifics, including genuine involvement of local stakeholders.

### **Participatory Forest Landscape Restoration Planning in South Sumatra**

Wijaya C.I. (World Agroforestry Centre (ICRAF) Southeast Asia Programme), Yunardy S. (Local Development Planning Agency (BAPPEDA) of South Sumatra Province), and Ekadinata A. (World Agroforestry Centre (ICRAF) Southeast Asia Programme).  
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Musi Watershed in South Sumatra became one of priority watersheds in Indonesia, due to the degradation of its watershed functions. Through participatory process, the study aims to formulate spatial plan of forest and landscape restoration (FLR) in order to regain ecological functionality and enhance human livelihoods across degraded forest and landscapes in Musi Watershed. To construct common understanding of stakeholders on environmental issues in the watershed, focus group discussion (FGD) on Driver, Pressure, State, Impact and Response (DPSIR) has been done, in which successfully identified forest fires, flood, landslide, drought, and soil sedimentation as five major environmental problems in Musi Watershed. By assuming inappropriate land uses towards designated uses or functions should be functionally restored, FGD participants examined the potential area of three FLR interventions using Pebble Method. Based on the FGD, wide-scale natural regeneration intervention would be focused in conservation areas located in Banyuasin, Musi Banyuasin, Musi Rawas, and Lubuk Linggau. Combination between wide-scale and mosaic species enhancement intervention would be applied in protection forest and non-forest land areas in Eastern and Southern parts of Musi Watershed, whereas rehabilitation and reclamation applied in protection forest areas in Banyuasin, Musi Banyuasin, and Southern districts of South Sumatra.

### **Land Use Type, Species Preference, and Ethnicity in the Vicinity of Restoration Area, Hutan Harapan - Indonesia**

Widianingsih, N. N. (Burung Indonesia (Birdlife affiliate)), Widianingsih, N. N. and Jiao, X. (Department of Food and Resource Economics, Faculty of Science, University of Copenhagen), David, W. (Department of Food Science and Technology, Universitas Bakrie)

Hutan Harapan is the first restoration area in Indonesia that is situated at the intersection of some of the most bio-diverse, yet threatened forest habitat in the world. However, this 20% of remaining lowland rainforest in Sumatra has experienced illegal land conversion to intensive commercial agriculture that essentially triggered by the rising agrobusiness and oil palm economy. Thus, before formulating solutions for restoration,

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investigation of distribution on adopted land use type and the factors that related to them must be analyzed. This study highlights the importance of ethnicity, migration and location that demonstrate influence on households' land use decisions and species preference. Survey data was collected on 268 households. Random sampling was applied to select households in five villages and five Batin Sembilan (indigenous) semi-nomadic groups. Sampled households belonged to three ethnic groups: 15% Batin Sembilan, 40% Local Malayan, and 45% Immigrant households. The results show the heterogeneity of land use type between the different ethnicities and location. Ranging from a strategy that places (staple) food first (e.g., paddy field and homestead garden) to one that places cash income first (rubber monoculture and oil palm plantation).

### **The Urgency of Forest Area Allocation in Spatial Planning for Mammal and Bird Conservation**

Santosa, Y., Purnamasari, I., and Perdana, A. Y. (Ecological and Wildlife Management Division, Departement of Forest Resources Conservation and Ecotourism, Faculty of Forestry, Bogor Agricultural University)

The roles of mammals and birds in maintaining ecosystem balance have much been studied. This study intended to justify the importance of retaining forest areas for mammal and bird conservation. Research was conducted in 6 oil palm plantation and surrounding forest areas in Riau during March-April 2016 using *line transect method* and assisted by camera traps for mammal which collected from various land covers simultaneously using 3 repetitions. The results showed that the number of mammal species in forest land cover found in 4 study sites were higher than those found within non-forest land cover, while in other study areas were relatively similar between the forest and the non-forest land cover. Similar findings were also observed for bird species. Forest land covers with the most number of mammal and bird species were the secondary forest and the High Conservation Value (HCV) forest, overgrown with various plants. Whereas the non-forest land covers with the most number of mammals and birds were dominated by oil palm trees of age 14 years and several forest tree seedling species, and old-growth oil palms of age 22 years. These findings indicated the urgency of allocating or retaining forested area to ensure mammal and bird conservation.

### **Mapping Evidence on Forest Conservation**

Nath, M. (International Initiative for Impact Evaluation (3ie))

Forests are integral to sustainable development (WDR 2015, UNEP, 2013) and provide resources and revenues to 1.3 billion people (The World Bank 2014). Despite their importance, high quality evidence on what works to prevent deforestation or what strategies are able to reduce trade-offs between development objectives and forestry related objectives, remains scarce.

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So what is the evidence around what works? Indeed how should we define 'evidence' and what do we know about what works, how and for whom, and how much, in the area of forest conservation? The International Initiative for Impact Evaluation (3ie) and WWF have collaborated to build and populate an 'evidence gap map' that illustrates the availability and need for evidence in forest conservation. The Evidence Gap Map takes stock of this evidence, in a comprehensive, exhaustive and unbiased way using protocols and intensive search strategies that go across more than 7 databases and illustrates the availability of evidence related to forest conservation sector in the low and middle income countries.

Our presentation will present an overview of what programmes work, for which outcomes and populations, at what cost and under what conditions. The presentation will focus on policy relevant findings based on the environmental, ecological and social welfare outcomes for different interventions that forest ecosystems, adaptive capacity, governance, local livelihoods and climate change. Our work also identifies key gaps where little or no evidence from impact evaluations is available and inform a strategic approach to build the evidence base in the forestry sector.

Sub-Theme:

### **Session 5.7. Integration of Land Base Sectors' Policy for Sustainable Development**

Chairperson(s): Dodik Nurrochmat (Bogor Agricultural University), Ristiananto Pribadi (Ministry of Environment and Forestry)

#### **The Landswap Policy of Oil Palm Plantations and Its Chance to Reduce Deforestation in Central Kalimantan, Indonesia**

Nurrochmat, D. R., and Purwawangsa, H. (Department of Forest Management and Directorate of Strategic Studies & Agriculture Policy, Bogor Agricultural University), Boer, R, Ardiansyah, M., and Ginting, G. (Center for Climate Risk & Opportunity Management (CCROM), Bogor Agricultural University), Erbaugh, J. T. (School of Natural Resources and Environment, University of Michigan)

Palm oil is one of the most important agricultural commodities in Indonesia, which its export value contributes more than 19 billion to the national earnings. Oil palm is the most efficient crop in terms of productivity in producing oil compared with soybean oil, rapeseed oil and sunflower oil. Indonesia is the largest palm oil producers in the world, where the oil palm plantation covers about 10 million ha of lands. In 2010, the country has set a target to increase its palm oil production from 25 million tons to be double by 2020. Therefore, this needs further forest conversion to establish new oil palm plantations. The allocation of those plantations often replaced forestlands, while there are million ha of bare-lands that remain non-productive. Since land use change is responsible for 83% of

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Indonesia's emissions, reducing forestland conversion is one of the key factors. This study assesses the potential to reconcile growth of the palm oil sector and reducing deforestation through land-swap policy, by supporting the expansion of palm oil plantations on low-carbon lands.

### The Role of a High Conservation Value Area in Palm Oil Plantations in Riau Province

Nurjannah, S. (Tropical Biodiversity Conservation Faculty of Forestry IPB), Zuhud, E. A. M., and Sunkar, A. (Conservation of Forest Resources and Ecotourism IPB)

Palm oil plantations are generally assumed to reduce biodiversity, however the establishment of HVC areas has the potential to dispel this negative accusation. At this moment in time there has not yet been a study on the effectiveness of HCV areas with regards to the conservation of biodiversity. Therefore, this study was undertaken in order to examine the role of a HCV area in palm oil plantations with regards to the conservation of biodiversity. The chosen method was an analysis of vegetation, exploration, and interviews with the owners and the local community. The results of the study show that HVC areas began to be applied in palm oil plantations in 2013 and 2014. This was due to the RSPO (Roundtable on Sustainable Palm Oil), which required that a plantation must avoid conservation zones that are needed to establish a HCV area. The HCV areas that were studied consist of two types: forest and riparian. Regarding the conservation of biodiversity, HCV areas were found to be more effective when forested compared with a riparian zone. This was because HCV riparian zones were dominated by already planted palm oil, meanwhile forested HCV areas had already been preserved by the local community before receiving a HCV certificate. The terms for designation as a HCV riparian zone were that the area be within 50 metres of a river. Management systems included the planting of different species of plants such as *Samanea saman*, *Switenia* sp, and *Bambusa* sp. The use of chemical fertilisers or the planting of palm oil was prohibited. The results of the study show that HCV areas help to increase the quality of river water, as well as increase the biodiversity of an oil palm plantation.

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