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A. Forests and Climate Change

Forest managers and policy makers need the best available science, models and decision tools, and monitoring systems to support adaptation and mitigation options for fostering healthy, productive forests and for ensuring continued provision of ecosystem services in a changing climate.

Contributions to this theme will include: effects of climate change on the structure and function of forest ecosystems; interactions between climate and disturbance regimes such as fire, insect and disease, or invasive species; effects of changing climate on ecosystem services; management options for facilitating adaptation of forest ecosystems; mitigation options for optimizing carbon sequestration and greenhouse gas (GHG) offsets; carbon and GHG accounting protocols; feedbacks between climate-induced changes, management options, and global warming potential; and monitoring the impacts of changing climate and of mitigation and adaptation actions.

A-01 Climate change in the boreal forest zone: impacts and interactions

Session coordinator: Susan Conard

Both recent climate data and climate projections suggest that the most rapid changes in climate will occur in the boreal and arctic regions. The vast boreal forests contain some 30 percent of the global terrestrial carbon, are a source of valuable natural resources, and include vast areas of relatively undisturbed forests that are critical for biodiversity. Effects are already being seen in migrations of plant species, changing patterns of insect infestations, melting of permafrost, and changing fire regimes. This session will focus on the impacts of climate change that are currently being observed in boreal zone forests, projections of future impacts, potential feedbacks between changing vegetation and disturbance patterns and climate, and the implications of these changes for sustainable management of the boreal forest resource.

A-02 Biodiversity and climate change: direct and indirect linkages in adaptation and mitigation

Session coordinators: Eckehard Brockerhoff, Herve Jactel, & Jean-Michel Carnus

Climate change policy can have significant effects on biodiversity, with the potential for both positive and negative outcomes. There are concerns that afforestation programmes for climate change mitigation and for bioenergy forests could result in biodiversity loss, particularly when such forests would replace 'natural' vegetation. On the other hand, there are considerable opportunities for afforestation programmes benefiting biodiversity conservation. Another important linkage is the functional role of biodiversity in forest adaptation to climate change. Diverse forests comprising many tree species are likely to be more adaptable to a changing climate. We propose to address these

important, but often overlooked, topics by assembling a group of speakers with different perspectives and from various backgrounds.

A-03 Can forestry and forest sector activities contribute to mitigating climate change?

Session coordinator: Werner Kurz

“Robbing the Carbon Bank” and “Tackle Climate Change: Use Wood” are two conflicting views of forestry and forest management activities. In an increasingly carbon-constrained world, forest managers are being asked whether their management activities contribute to increasing atmospheric concentrations of greenhouse gases or whether they are contributing to climate change mitigation portfolios. Increasingly complex analyses are demonstrating that the impacts of forest management on the climate system can be positive or – in some circumstances – negative. There is an urgent need for synthesis of the scientific findings to aid policy makers, land managers and the public in their efforts to address climate change mitigation goals. This session will bring together three senior speakers and three junior, emerging scientists, to address the contribution of forest management and forest sector activities in a range of geographic system (boreal, temperate and tropical). The emphasis will be on studies that have taken a system’s perspective that includes carbon stocks in forests, harvested wood products, and the benefits of substitution effects achieved from the use of wood products or bioenergy. We will encourage volunteer oral presentation, poster presentations and explore the possibility of a special issue or other scientific publication resulting from the session.

A-04 Competing roles of forests in climate change mitigation

Session coordinators: Lauri Valsta & Birger Solberg

The forests of the world are in the middle of a severe controversy concerning their role in climate change mitigation. On one hand, it has been proposed that forests should be left uncut to maximize carbon storage and other environmental benefits. On the other hand, it has been suggested that the renewable materials and energy from forests are increasingly important for mankind. What are the determinants of the optimal management of forests from the point of climate change mitigation? How does renewable resource utilization affect the adaptive capacity of forests? The IPCC Fourth Assessment Report on Mitigation notes that forest-based mitigation measures are largely unused for various reasons, the controversy described here being one of the open issues. The report also describes the need for comparing goods and services provided by forests with the carbon benefits. Session topics will include: Updated global views of the importance of forests; Climate Change policies, global modeling of land-use and forestry; Integrating carbon storage and forest utilization; and, Sequester or harvest: what determines the best management of forests in order to mitigate climate change

A-05 Plantation forestry under marginal conditions: water use and water use efficiency in a changing climate

Session coordinators: Nathalie Long & Andrew Merchant

This session will explore current understanding and expertise regarding plantation water use and water use efficiency at a range of spatial and temporal scales. It will encompass examples from a range of forest types with a focus on the resilience of physiological processes with respect to the future effects of climatic and edaphic changes. Ultimately the session will seek to address questions regarding the concept of water use efficiency, its multigenic control, and its significance as a selective tool in tree improvement. This session will lead to a more complete and realistic understanding of how the concept of water use efficiency can be used in realising scientific and management objectives in plantation forestry under marginal conditions.

A-06 Assessment of forest management strategies for facilitating adaptation and mitigation in rapidly changing forest systems

Session coordinators: Anne-Helene Mathey & Craig Nitschke

Our environment is changing the context in which we are making forest management decisions. Most notably, climate change is already impacting ecological processes, forest productivity, ecological

services, and carbon sequestration in many regions and these impacts are predicted to intensify. Our social and economic structures are also evolving rapidly with new markets, new demands, urbanization, and the decentralization of governance. These changing contexts are interacting with one another at local, regional and international scales which are complicating management. The objectives of this session will be to highlight methodologies and modeling tools that explore the interactions between forest management and rapidly changing environments. Papers in this session will present novel approaches for assessing the sustainability of current or alternative management actions taking place in a changing world. Papers will also address environmental, social and/or economic changes and highlight the consequences of such changes on our ability to conserve biodiversity and/or manage forest resources sustainably.

A-07 Is climate change leading to global increases in drought-induced forest dieback?

Session coordinators: Edward H. (Ted) Hogg & Craig D. Allen

Over the past decade, there has been a notable increase in the reporting of large-scale forest dieback episodes worldwide. In many cases, severe drought has been identified as the primary cause of dieback, either directly or through drought-related increases in forest damage by insects and diseases. This is a serious global concern for the future, especially in sub-humid and semi-arid regions, where most global climate change projections have indicated a strong likelihood of progressively hotter and drier conditions during this century. This session will bring together expertise from presenters with experience in documenting and assessing drought-related forest dieback in North and South America, Africa, Australia and Eurasia. Its objectives are to: Provide an up-to-date, global overview on the issue of drought-related forest dieback, through presentations highlighting major dieback episodes from around the world; Provide insights into the scientific and region-specific logistical challenges in determining the causes of forest dieback and in measuring and reporting its extent; Provide examples of the broader region-specific implications of recent and ongoing episodes of forest dieback (e.g., on human society, wildlife and other aspects of ecosystem functioning); Examine the evidence that drought-related forest dieback is increasing, and that it is being caused, at least in part, by global climate change.

A-08 Strategies for linking climate change mitigation and adaptation in tropical forestry

Session coordinator: Daniel Murdiyarso & Bruno Locatelli

Knowledge and experience are currently lacking with regards to synergies or conflicts between climate change mitigation and adaptation strategies in the forestry sector at local, national, and international levels. Therefore, greater understanding and information sharing are necessary to establish appropriate guidelines for developing policies that effectively address both programs and projects. Tools and methods are also needed for analyzing the synergies and conflicts between mitigation and adaptation. Objectives of the session are: To highlight the strong links between climate change mitigation and adaptation in tropical forests; To explore strategies for building synergies between adaptation and mitigation at local, national and international level. The session will consist of panel of speakers who have experience in mitigation of adaptation to climate change in forestry sector. In addition, a forward looking presentation on funding mechanisms in both mitigation and adaptation will facilitate the debate to enhance possible synergies and avoid conflicts.

A-09 Implications of changing fire regimes

Session coordinators: W.J. (Bill) de Groot, Ahmad Ainnudin Nuruddin & Douglas McRae

This session is designed to provide broad international coverage of major social, economic, and environmental issues affected by the changing global fire situation. The objectives of the session are to review and discuss the changing trends in global fire regimes as climate change progresses. The topics will cover global fire and: climate change, conserving biodiversity, carbon balance, people, poverty and fire use, human health, and land-use change. The session will be comprised of 6 invited oral presentations, as well as selected poster presentations. Presentation summaries will be compiled as an international summary of the current understanding of fire and climate change issues and potential global solutions, for the United Nations publication "International Forest Fire News".

A-10 Adapting to future wildland fire regimes

Session coordinators: W.J. (Bill) de Groot, Ahmad Ainnudin Nuruddin & Douglas McRae

This session will provide a broad international overview of new approaches to adapting to changing fire regimes and related human and ecological issues. The objectives of the session are to present recent advances in fire science and technology, and discuss how it can be utilized in fire management to minimize the negative impacts of future fire regimes. The topics will cover advances in remote sensing and fire, managing wildland fire threat, fuel management, fire danger rating, early warning of extreme wildland fire burning conditions, and reducing wildland fire disasters through international collaboration. The session will be comprised of 6 invited oral presentations, as well as selected poster presentations. Presentation summaries will be compiled as an international summary of the current understanding of fire and climate change issues and potential global solutions, for the United Nations publication "International Forest Fire News".

A-11 Fire and sustainable management of future forests

Session coordinators: W.J. (Bill) de Groot, Ahmad Ainnudin Nuruddin & Douglas McRae

This session will focus on fire research and fire management practices in support of sustainable forest management. Presentations will include assessments of recent global wildland fire situations and strategies to adapt future fire and forest management practices to changing growing regimes, fire regimes, and land use patterns. Presentations will address this topic in the context of social, environmental, and economic implications. The objective of this Session is to present new and emerging concepts on the science and practice of fire and sustainable forest management. The Session format will include both oral and poster presentations. Presentation summaries from this session will be compiled as an international summary of "Emerging concepts and practices in fire and sustainable forest management for a changing climate", for the United Nations publication "International Forest Fire News".

A-12 Adaptation of temperate and boreal forests to climate change - what experimental trial system is needed?

Session coordinators: Andreas Bolte, Mirko Liesebach & Palle Madsen

Climate change will lead to changes in forests' health, productivity and environmental services. Adaptive forestry can assist forest adaptation to climate change in order to reach management goals and desired forest ecosystem services. However, for development of appropriate adaptive forestry practices, more information on species and provenance suitability and the effects of a changed silvicultural regime are needed. The proposed session shall initiate a discussion and implementation process for the establishment of an internationally accepted experimental protocol and trial system including native and non-native species and provenance suitability testing (in pure and mixed stands) as well as silvicultural experiments (stand tending). Specific objectives include development of a conceptual design of an international trial system for adaptive forest management (provenance experiments/protocol, not monitoring!), discussing the linkage with existing IUFRO provenance trials and international monitoring systems (e.g. LTER). The session will include a short presentation on existing concepts and networks followed by a moderated panel discussion.

A-13 Climatic gradients in mountains: opportunities for studying forests facing climate change

Session coordinators: Peter Brang & Roque Rodríguez Soalleiro

The environmental gradients found in montane regions, formed by differences in altitude and aspect, and sometimes also by variations in bedrock, offer the opportunity to study climate change impacts and reactions in highly different environments that are located within short distances of one another. The objective of the session is to explore the opportunities of using the steep climatic gradients found in mountain terrain for studying impacts of changing climate on forests, and subsequent reactions of affected forests. The main impacts to be covered in the session are those related to the occurrence of disturbances and changes in tree growth. The main reactions to be considered are regeneration processes, with a particular focus on the question of whether the recruiting young growth is more

adapted to future climate than the existing forest.

A-14 Quality wood from forests in a changing climate

Session coordinator: Pekka Saranpää

This session will focus on what effect future climate change will have on tree growth and wood properties. While good knowledge exists on the effects of silvicultural practices on branch size, stem taper and tree form, less is known about how these practices affect internal wood properties such as density and stiffness. These properties are also strongly affected by environmental characteristics, and therefore it is expected that they will be affected by future climate change. The ability to meet the needs of end-users of wood products now and into the future is a key challenge for the forestry sector. Invited speakers from contrasting geographic regions will present experiences in their country, a broad overview of current research in the field, and key challenges that need to be addressed through future research. Other speakers in these sessions will be selected with the aim of creating a good balance of perspectives on the session themes. For oral presentations, preference will be given to those studies that give a broad perspective to the topic, while poster contributions should report studies in progress or which are more narrowly focussed topics.

A-15 Silviculture and global change: managing forests for ecosystem resiliency and carbon storage

Session coordinators: Kevin O'Hara & Juergen Bauhus

Most global change scenarios indicate significant effects on forests. These include changes in precipitation patterns, more frequent extreme events such as storms, fires or pest outbreaks, reduced and expanded ranges of trees, and changes in forest community composition. Forests also have the potential to store substantial amounts of carbon and mitigate climate effects. This session will address strategies to improve resiliency/adaptability of forests and carbon storage through silvicultural design of forest structures. The session will also explore, to what extent these two management strategies are compatible.

A-16 Integrating climate change mitigation strategies with enhancing livelihood options through CDM and REDD mechanisms

Session coordinators: Sushil Kumar & Bastiaan Louman

The United Nations Framework Convention on Climate Change (UNFCCC) recognizes the important role of land use in achieving the goal of stabilizing concentrations of greenhouse gases atmosphere and includes commitments relating to this sector. While the market-based Clean Development Mechanism (CDM) has benefited mainly technically and financially advantaged organizations, those in the agriculture and forestry sectors, the backbone of many economies in the developing world, remain neglected due to many technical and institutional limitations. In order for rural communities to benefit from CDM and enhance their livelihood options, mitigation and adaptation measures need to be integrated into developmental projects. The objective of this session to discuss possible institutional arrangements to promote integration of climate change mitigation and adaptation strategies with enhancement of rural livelihood options. Specific topics will include: the role of CDM forestry projects in enhancing rural livelihood options – successes, challenges, and the role of financial institutions; and issues and challenges for the implementation of Reduced Emissions through Deforestation and Degradation (REDD) mechanisms. The session will include presentations by invited speakers followed by a panel discussion and poster presentations.

A-17 Dendrochronology – a useful tool in climate change research

Session coordinators: Margaret Devall

Dendrochronology provides a method of accurately reconstructing past environments from tree ring chronologies, and can be helpful to forest managers and policy makers in sustaining healthy forests in a changing climate. The study of tree rings can aid in climate change research in various ways, providing a proxy environmental record of climate prior to the instrumental record that may extend

back for hundreds or even thousands of years. This record can help us to understand the present and can be used to predict the environmental response to future disturbances. Tree ring analysis has been used to date events such as fires, floods, insect outbreaks and hurricanes which may change in frequency with climate change. This session will explore recent developments in dendrochronology and its relevance in climate change research.

B. Biodiversity Conservation and Sustainable Use of Forest Resource

Biodiversity is the foundation of the broad range of forest goods and services that sustain and enrich our lives. Improved understanding of biodiversity from intraspecific to landscape levels is critical for conservation and sustainable use of forest resources. Contributions to this theme will highlight scientific advances related to the role of biodiversity in sustaining environmental, economic, social and cultural values of forests, and explore topics such as conservation policy and management, managing biodiversity in a changing climate, forest landscape restoration, recreation and nature-based tourism, urban forests and amenities, bioenergy and non-timber forest products.

B-01 New perspectives in landscape patterns – changes in edges, connectors, and landscape matrix

Session coordinators: Peter Vogt & Kurt Riitters

Reliable and meaningful landscape pattern assessments are pre-requisite to predicting and interpreting the impacts of landscape patterns on biodiversity and other forest resources over time and space. If landscape patterns are not measured well, then it is not likely that any biodiversity interpretations of those patterns will be meaningful either. While there has been much research on this topic, not all of that research has contributed to a better understanding of how to measure and interpret pattern *per se*. The objective of this session is to motivate and demonstrate the emergence of new landscape ecological perspectives aimed at harmonized assessment of the dynamics of edges, connectors and landscape matrix from local to global scales. Presentations will include both conceptual contributions and examples of practical applications. This session is expected to identify opportunities for international research cooperation among subject-matter specialists and for broader application of research results by member organizations.

B-02 Aquatic biodiversity conservation in forests

Session coordinators: Deanna Olson & Melvin Warren

Forest-dependent biodiversity includes stream- and wetland-dwelling species that are highly associated with forested ecosystems and their attributes. This biota can be adversely affected by forest management practices. For example, timber harvest may alter aquatic habitat conditions such as water temperature, substrate composition, and down wood availability. Sustainable forestry practices include those that retain the forest processes and functions upon which these aquatic organisms rely. This session will focus on forest aquatic biodiversity. Presenters from around the world will be solicited to give papers on the aquatic biota in forested systems, focusing on their linkages to forest attributes, how they are affected by forest management practices, and innovative approaches to their conservation.

B-03 Improving livelihoods through research and action in biodiversity-rich tropical forest landscapes

Session coordinators: Jean-Laurent Pfund, Terry Sunderland & Robert Nasi

Scientists and conservationists have become aware that conservation approaches based on targeting threats and establishing protected areas are necessary but not sufficient. Forest patches, secondary forests, agroforests and plantations play a key role for biodiversity conservation in the tropics. They are often beyond the direct control of the government and their institutions and subject to pressures originating from sustaining people's livelihoods or conversion to a more profitable agricultural system. The objective of the session is to contribute to new ways of conducting research in tropical forest

landscapes to support the integration of biodiversity conservation and livelihood concerns into adaptive forest management processes. Based on research and development activities conducted in several countries, presentations will highlight the key drivers for biodiversity conservation and livelihoods observed in the studied landscapes, focusing on accessibility to markets, landscape patterns, local rights and governance. The discussion will focus on multidisciplinary options to study and approach forest landscapes and the way to design research so that it can catalyze adaptive management for improved livelihoods.

B-04 Uneven-aged silviculture in temperate and tropical forests: towards paradigm expansion
Session coordinator: Kevin O'Hara

The general objective of the session is to foster sharing of information on stocking control procedures for uneven-aged forest stands. Stocking control procedures are the central component of uneven-aged silvicultural systems because they determine residual stand structure, species composition, cutting cycle length, and harvest intensity. However, there has been little progress in the development of stocking procedures in recent decades. This session will facilitate scientific contributions and networking in the discipline of uneven-aged silviculture towards new approaches and moving beyond current paradigms of stocking control. The session will include a diversity of presentations that encompass: uneven-aged forests from tropical to boreal extremes, pure and mixed stands, and uneven-aged systems that address a variety of objectives that range from timber production to biodiversity conservation.

B-05 Bushmeat in Central Africa: beyond the ecological crisis
Session coordinator: Nathalie van Vliet

Hunting for food in Central Africa is an issue of concern because there is strong evidence illustrating that the scale of hunting, occurring in these regions, poses a real threat to many tropical forest species. The so-called "bushmeat crisis" is the focus of many conservation organizations and of a number of development programs throughout Central Africa. However most of the debate has concentrated in the ecological impacts of the bushmeat trade, while the links between bushmeat and livelihoods, health, culture and local economy, are either poorly understood or not properly taken into account. The purpose of this session is to provide stronger evidence of the hidden links between bushmeat and livelihoods, beyond the ecological crisis. We will particularly focus on: 1. The bushmeat market chain and its contribution to local economy; 2. Integration of tradition related to bushmeat consumption in modernized Central African societies; 3. Health and nutrition issues related to bushmeat consumption and trade. Our discussions will result in recommendations to policy makers on how to regulate hunting and bushmeat trade to ensure the continued benefits from the sustainable use of wildlife without threatening the most endangered species.

B-06 Reporting on sustainability of temperate and boreal forests using criteria and indicators: Part 1

Session coordinators: Se Kyung Chong & Richard Guldin

B-07 Reporting on sustainability of temperate and boreal forests using criteria and indicators: Part 2

Session coordinators: Takeshi Goto & Richard Guldin

The objective of this 2-part session is to highlight recent scientific advances in monitoring, assessing, and reporting on sustainable forests using sets of criteria and indicators. The 12 Montreal Process countries are in the midst of preparing second-generation national reports in a 2008-2010 time frame. At the same time, the Montreal Process Working Group (MPWG) has been collaborating with the Pan-European Process (MCPFE) and the International Tropical Timber Organization (ITTO) to advance the use of criteria and indicators to track progress in conserving and sustainably managing forests in their member countries. Speakers at this session will highlight the advances made in their countries/organizations towards improving the quality and consistency of information available for national reporting and the ways that information is being used to inform policy making within the

country and in international forums. This first of sessions (B-06) will focus specifically on advances in criteria for biological diversity (Montreal Process criterion 1), forest health (Montreal Process criterion 3), soil and water resources (Montreal Process criterion 4), and climate change (Montreal Process criterion 5). The second session (B-07) will focus on the other three Montreal Process criteria (forest productivity, criterion 2; social and economic indicators, criterion 6; and legal/institutional, criterion 7). The hope of the session organizers is that specialists working in these areas will also be able to network with colleagues working on similar issues in other countries.

B-08 Conservation of arthropods on forested landscapes

Session coordinator: John Spence

The speakers in this session will be present a cross-section of cutting edge research focused on how forestry practices can be best modified to conserve arthropod diversity, especially those associated with the forest floor and coarse woody material. The program will address the sorts of species that are most threatened and why, in addition to explaining research that is needed to design, apply and test the effectiveness of various conservation strategies on forested land subject to harvest. Each speaker will be encouraged to directly address management and policy implications of their research.

B-09 Scientific theory and practical realities in sustainable forestry

Session coordinator: Jamie Barbour

The concept of sustainable forest management seems simple: find the intersection of ecological, social, and economic goals for a landscape. Putting this concept into practice is extremely difficult. This session will explore these difficulties and offer solutions based on research and practical experience. Speakers will consider alternative policy goals for achieving sustainable conditions on large landscapes with mixed public and private ownership. It will examine successes and challenges of existing practices and offer ideas on new ways to encourage landowners to act in consort to achieve goals of sustainable forestry.

Working titles for speakers include "Pros and cons of spatial segregation versus integration of forest management objectives", "Strategies for unifying landowners around common management themes", "Incorporating natural disturbance processes into landscape scale management planning", and "Approaches to conserve biological diversity in the face of socio-political uncertainty".

B-10 Conservation and sustainable use of forest genetic resources

Session coordinators: Zheng Yongqi, Sim Keok-Choh & Kang Kyu-Suk

Objectives of the session are to exchange and discuss the latest advances and emerging issues in forest genetic resources (FGR), particularly relating to developing countries where their sustainable utilization of is more apparent. Topics of the session: 1) Current status of FGR and identified critical existing problems; 2) New technologies available for better FGR conservation and utilization; 3) Strategies of FGR conservation and breeding and their inter-relations; 4) Sharing of FGR information and genetic materials; 5) FGR management in response to climate change; 6) National, regional & international FGR programs and cooperation in conservation and utilization; 7) Principles, standards and procedures of prioritizing FGR conservation.

B-11 The contribution of science to the fight against illegal logging

Session coordinator: Andreas Ottitsch

The session objectives, based on work compiled by the Task Force "Illegal Logging and FLEGT-Processes", are to explore the contribution of science towards identification of the types and consequences of illegal logging, as well as evaluation of approaches to combat illegal logging. Session presentations will be based on recently completed research results as well as ongoing research activities, ranging from field-research in producer countries to policy evaluation research related to recently implemented and ongoing processes in consumer countries. The presentations and discussion report will be published together with other IUFRO Task Force results in a Special Issue of *Forest Policy and Economics* (Elsevier).

B-12 Sustaining tropical timber species: is science making a difference?

Session coordinator: Sheila Ward

High-value tropical timber species are still harvested unsustainably in natural forests, and also suffer from poor regeneration, reduced genetic variation, and insect predation. These problems of sustainability are similar in the eastern and western hemispheres. The successful management of these species in natural forests will help maintain their biodiversity at the genetic and species levels, and also help maintain associated species and the local human communities that depend on forest resources. In this technical session we will evaluate the impact of research and technical transfer on the management and sustainability of high-value tropical timber species, including natural forest management for regeneration and growth, conservation and use of genetic resources, use of genetic markers to track illegal logging, and control of insect attack. Species to be discussed will include members of the Meliaceae and others. The session will include a moderated panel discussion, with associated posters to broaden participation.

B-13 Speaking with one voice – scientists and stakeholders in forestry

Session coordinators: Daniela Kleinschmit & Ingwald Gschwandtl

The aim of the session is to highlight the potential of a common and comprehensive strategic approach to forest related communication that enables the forestry sector to reach out to other sectors relevant to forests and the public, in order to influence policy making at all levels. The session will include a mixture of presentations by individual speakers and a panel discussion. For the presentations communication experts (science communicators and public relations specialist from forest industry/administration) are asked to give examples of communication strategies and events and to reflect on cooperative action in forest sector communication or on the challenges and obstacles a common sector communication “speaking with one voice” has to deal with. After the presentation the speakers will be asked to discuss in a panel the advantages and obstacles of “speaking with one voice”. The panel discussion will begin with a short reflection of scientific results on forest (science) communication its opportunities and obstacles.

B-14 Multiple-use management and sustained use of tropical production forests

Session coordinators: Plinio Sist & Robert Nasi

Forest management systems are still dominated by selective logging, as the most profitable economic option in managed natural forests. However, silvicultural systems based on timber present serious limitations to achieve sustainability and a growing number of scientists believe that multiple forest management (MFM) should be promoted as a new paradigm for tropical production forests. Our objective is to assess the present situation regarding the implementation of multiple forest management systems where tropical production forests still occur (Amazon basin, Congo Basin and SE Asia) based on regional assessments and specific case studies. We aim at addressing the following questions: 1. What past and ongoing logging-MFM initiatives exist in the three world tropical regions? 2. What are the main constraints and the favorable ecological, social, institutional, economic and forest policy/regulation drivers for the implementation of such systems? 3. What is the potential of Reduced Emissions from Deforestation and Degradation and other payment for environmental services? 4. Under which conditions are selective logging and extraction of non-timber forest products compatible sustainable activities?

B-15 Silvicultural systems for tropical forests: challenges and progress

Session coordinators: Robert Nasi & Sylvie Gourlet-Fleury

The complexity of tropical silviculture for natural forests has substantially increased as a result of a wider range of often conflicting management objectives, a wider range of forest ecosystem conditions, and forest users. Within this increasingly complex working environment, tropical silviculture and in particular management systems aimed at achieving long-term sustainability of timber yields, remains challenging. Silvicultural management systems currently used in tropical forests are typically high impact systems that often do not result in strictly sustainable yields in terms of the original species and size class composition; producing permanently altered and impoverished secondary forests. While

reduced impact logging practices, while important, are insufficient to achieve true long-term sustainability and maintenance of biodiversity. The objectives of this session are to examine the current state-of-art in tropical silviculture, identify prevailing inadequacies/limitations, and to explore new approaches that are better aligned with tropical forest dynamics, biodiversity conservation and economic realities.

B-16 Sustainable forest recreation management: a discussion on social criteria and indicators
Session coordinators: Tuija Sievänen & Ulrike Pröbstl

There are several international processes such as the Montreal Process and the Ministerial Conference on the Protection of Forest in Europe (MCPFE) which aim to monitor the status of sustainable forest management and use. There are many approaches to define criteria and indicators for sustainable forestry. Each academic discipline and stakeholder group expects that the set of indicators will enhance their concerns in future forest management. The session will give an overview on criteria and indicators of sustainable recreational use in different parts of the world, and discuss and compare experiences and successes/failures of monitoring these indicators. It will also consider the policy documents where these criteria and indicators are presented, and the processes behind how their development. Finally, the session will discuss of the need for internationally comparative criteria and indicators of sustainable forest recreation planning and management. The session seeks to improve our understanding of the need and use of social criteria and indicators as a tool for better planning and management of forest recreation resources.

B-17 Evaluating management effectiveness of protected areas
Session coordinator: Vinod B. Mathur

Information on the status and trends of biodiversity within protected areas is important to both biologists and managers. Understanding the cause-and-effect linkages between management and outcomes is critical for identifying how management can be improved. The evaluation and improving the management effectiveness is one of the Goals of the Convention on Biological Diversity (CBD) Programme of Work on Protected Areas and its target to develop by 2010 a framework for monitoring, evaluating and reporting at the site, national and regional levels and to implement management effectiveness evaluations of at least 30% of the global protected area network. A number of monitoring and assessment systems have been developed worldwide and are being implemented with varying degrees of success. In this context this session is very timely as it will help to review the progress made in achieving this important goal of CBD. The objective of the session is to review the recent scientific developments in assessing the management effectiveness and also to share the lessons learned globally. The session would include presentations by experts from both the developing and the developed world to share their experiences, and presentations of recent research by individual scientists, followed by a panel discussion.

B-18 Identifying and monitoring old growth forests in boreal, temperate and Mediterranean environments
Session coordinators: Anna Barbati, Piermaria Corona & Thomas Spies

The objective of this session is to review the state-of-the-art and share perspectives and research findings on the structure and dynamics of old-growth forests in boreal, temperate and Mediterranean environments with the aim of defining guidelines for their identification and monitoring. Invited presentations and voluntary papers will address the following questions: (1) What are the general definitions/concepts of old growth forests in different environments and what are the similarities and differences in approaches to definitions and monitoring? (2) Is it possible to define a series of parameters and indicators which are consistent with a scientifically valid definition of "old-growth forest" and at the same time are operationally useful for the identification of old-growth forests in conservation planning and management? (3) How can we monitor changes in old-growth forest structure and functionality? (4) How can this type of information help in defining guidelines for conservation and management of old-growth forests in different ecological zones? A series of oral presentations will be followed by a synthesis and discussion on how advances in old-growth forest

monitoring can contribute to more effective forest biodiversity conservation.

B-19 Statistical methods in biodiversity assessment and biodiversity responses to silviculture
Session coordinators: Tzeng Yih Lam & Douglas A. Maguire

In the face of critical environmental issues such as climate change, deforestation, and desertification, biodiversity conservation has become a top priority for scientific discussion and research. In order to adequately assess changes in biodiversity, baseline information is essential and statistical tools that could provide this information reliably are paramount to successful management and policy. Practice of multi-aged silviculture and innovations such as variable-retention have been proposed to meet economic and social sustainability objectives as well as conservation of biodiversity. Responses of multiple forest taxa to silvicultural strategies are interrelated at multiple scales, and statistical methods must recognize this complexity to make reliable inferences. The overall goal of this session is to explore and discuss current developments in statistical methods that could advance our ability to assess biodiversity and its response to management activities. The three specific topics are: (a) Issues in biodiversity assessment such as species richness estimation, (b) Associations between multiple forest taxa and their collective responses to silviculture treatment through a variety of statistical tools, particularly Structural Equation Modeling and Bayesian Belief Networks, and (c) Other statistical challenges including detection and monitoring of rare species.

B-20 Analysing the "translation" of global discourses on forest governance to regional, national and local levels

Session coordinators: Karl Hognl & Daniela Kleinschmit

Broad international discourses on sustainable forest management and forest governance have manifested in a huge variety of forms and forums at international and regional levels. At first glance, this general trend is very surprising since in many countries several procedural governance principles have been rather new to the forest sector, in particular the emphasis on broad stakeholder participation. Though many critics judge international forest politics as a failure, there have been some success of international forest politics in terms of policy output and the emergence and stabilisation of a number of institutions, rules and discourses. This raises the analytical question of whether and how effectively the international impulses have translated into and were taken up at national, sub-national and local level forest policy arenas. This session will examine the role and effectiveness of some principles of these so-called "new modes of governance", i.e. of participation, cross-sectoral as well as multi-level coordination (policy integration) in recent processes of forest governance from different analytical perspectives.

B-21 Assessing the effects of forest management on biodiversity over large landscapes: tools, trends and implications for conservation

Session coordinators: Ken Sugimura, Sandra Luque & David Langor

Maintenance of biodiversity in forest ecosystems that are increasingly perturbed by global environmental changes and resource exploitation presents a huge challenge to forest managers. Affordable and efficacious tools and approaches are needed to assess and monitor over large forested landscapes the impact of human pressures on the health and persistence of the species that depend on these ecosystems. Since biodiversity incorporates a wide range of taxonomic groups and scales (gene to ecosystem), multi-criteria approaches are needed to provide effective measures while evaluating consequences of management decisions. Adaptive management alternatives need to be incorporated within a holistic landscape level approach towards forest management. By featuring new research from Europe, Asia and the Americas, this session will highlight advancements in the development of tools and approaches to assess biodiversity trends over large forested landscapes, and benefits to conservation. Adaptive forest management to balance multiple objectives under changing environmental conditions will be discussed from a landscape perspective. The session will include presentation of individual papers followed by a roundtable discussion on the regional differences, common problems and solutions.

B-22 Forest biodiversity – the key to healthy and resilient forests

Session coordinator: Tim Christophersen

The session will commence with a short celebration of the International Year of Biodiversity in 2010, with a short movie and a keynote address by the Executive Secretary of the CBD. The technical part of the session will highlight the importance of forest biodiversity for human well-being, by providing essential ecosystem goods and services. In particular the linkages between forest biodiversity and ecosystem resistance and resilience will be explored, as well as the function of resilience as a key factor for adaptation, and risk mitigation strategy for forest investments. The session format will be based on three invited presentations, followed by a moderated panel discussion.

B-23 Traditional forest related knowledge in Africa – challenges and opportunities

Session coordinators: Paul Ongugo, Doris Mutta & William Mala

Traditional forest-related knowledge is a valuable source of knowledge critical to sustaining livelihoods of cultural communities worldwide. It has contributed significantly to present body of knowledge possessed by scientists in the fields of ethnobotany, ethnopharmacology, forestry, ecology and environmental studies. Integral to traditional forest knowledge are the elaborate taboos, myths, folklore and other culturally controlled systems which bring coherence and shared community values to resource use and management. However, science, technology and governance institutions seldom embrace the values of traditional knowledge, innovations and practices, and legal recognition and protection is a continuing challenge. This session will discuss recent developments in the sustainable management of forest related traditional knowledge. Oral and poster presentations are invited on the following topics: a) integration of forest related traditional knowledge in science, technology, economic and governance institutions; (b) approaches for strengthening intellectual property regimes towards effective protection of traditional forest knowledge; (c) issues related to communal cultural property rights in relation to traditional knowledge and biodiversity and the central role of women; and d) the utilization of traditional forest knowledge in adaptive co-management of forest resources in the face of uncertainty (associated with climate variability) in the behaviour of African ecosystems.

B-24 Ecology and management of mixed species stands under changing climatic conditions and environmental uncertainty

Session coordinators: Bogdan Strimbu, Valeriu-Norocel Nicolescu & Guan Biing

Development of research methodologies to characterize their structural and functional attributes, and how these are affected by climate change and other environmental uncertainties is needed to develop appropriate monitoring and adaptive management systems. The session aims to present the latest advances in the characterization of mixed-species forests stands. The session will focus on the techniques used to quantify the biomass dynamics and the impact of species composition on biomass productivity, wildlife and stand vulnerability, as well as the uncertainties associated with these research methodologies. Mixed-species stands play a central role in biodiversity conservation and carbon storage in terrestrial ecosystems.

C. Forest Environmental Services

Beyond their provision of direct economic and social benefits in the form of timber, woodfuels, foods, medicines, and other non-wood forest products, forests and trees provide a range of ecosystem services that are fundamental to human well-being. Optimizing these broader societal benefits requires sound understanding of both the complex relationships between forest structure and function and the provision of forest environmental services, and how provision of these services are affected by environmental and social changes and by forest and broader landscape management. Contributions to this theme will examine such topics as the role of forests and woodlands, and their management, in the maintenance of favorable climate and air quality, prevention and mitigation of floods and other natural disasters, maintenance and restoration of water quality and the natural productivity of soils, amelioration of air and water pollution, and the provision of scenic beauty for recreation and eco-tourism, and inspiration for the arts and other cultural and spiritual activities.

C-01 Stand structure: a key issue in managing forests for timber, wildlife, water, and NTFP resources

Session coordinators: Valerie LeMay & Peter Newton

Management of stand structure has become a primary issue in the provision of ecosystem services. In the past, management of woodland areas was focused on the provision of timber resources, with secondary objectives of long-term ecosystem stability. Stand structure management has now changed towards the provision of a variety of resources including water, soil stability, wildlife habitat, and non-timber forest products, while providing for timber products revenue. This change in focus has resulted in the need for changing measurement and management, as stands become more diverse to meet multiple management objectives. The session objective is to highlight the changes in management towards more diverse stand structures to provide a diversity of ecosystem services, and to determine the gaps in research. To achieve this objective, we will include speakers from a number of continents, including graduate students, and talks on management and measurements for a variety of products.

C-02 Integrating forest products with environmental services

Session coordinator: Robert Deal

Forests provide many ecosystem goods and services including wood products, carbon, water and biodiversity. Ecosystem services and markets for these services can play an important role for providing incentives for forest landowners and managers while sustaining these critical services. Research will be presented on critical topics that integrate forest products with the theme of forest environmental services including: the role of ecosystem services and wood production, carbon sequestration and carbon life-cycle analysis, forest products from sustainably managed forests, wetland mitigation and species conservation banking, water quality and wood production, and the economic contributions of wood products to enhance sustainable forestry management. We plan to publish invited papers from these sessions in either a book or a special issue in a research journal.

C-03 The use of quantitative forest sector modeling in environmental policy analysis

Session coordinators: Birger Solberg, Margareth Shannon & Ilpo Tikkanen

During the last decades we have seen that quantitative forest sector modeling has been increasingly used as an information provider in policy analysis where environmental issues like biodiversity protection or climate change are involved. This has created an interesting interface between modeling, economics and policy analysis, and it is important to explore the experiences gained so far and improvement possibilities. The session will address the following questions: 1. What types of environmental policy issues have been analysed by using forest sector modeling? 2. What have been the weak and strong points in those analyses? 3. How can the weak points be improved? The session will include two sets of presentations - one by researchers from the quantitative modeling side and one by researchers from the policy analysis side, each set addressing all three questions, followed by a panel discussion session.

C-04 The role of institutions and institutional economics in sustainable forest management

Session coordinators: Shashi Kant, Martin Hostettler & Yaoqi Zhang

Sustainable Forest Management (SFM) is a reflection of environmental, social, and economic value systems of our society. Climate change is a dominant element of environmental as well as economic value system of present and future generations, and therefore SFM has also emerged as a critical element in the overall efforts to deal with climate change. In this context, the main challenge faced by policy makers and forest managers is to design optimal institutions for SFM that incorporate human preferences for the provision of various forest-based ecosystem services, such as carbon sequestration and watershed services, as well as for the climate change. Hence, the main objective of this session will be to extend the boundaries of forest related institutional economics beyond the economics of institutions related to timber management. The session will focus on the economics of institutions for SFM designed for the provision of ecosystem services and mitigating climate change.

C-05 Short rotation forestry for livelihood security, energy and carbon sequestration

Session coordinators: Sanjeev Kumar Chauhan & Thomas Lewis

The fuelwood crisis in developing countries has necessitated the promotion of short rotation woody crops (SRWC) not only to meet fuelwood demand but also to protect existing forests from further destruction and maintain ecological balance. Many opportunities exist for linking dendro-remediation with tangible biomass economic opportunities such as bio-energy, solid wood products and reconstituted products. The potential of forests (natural or plantation) for mitigating climate change has been recognized and short rotation forestry, including agroforestry, can enhance their value as carbon sinks, although carbon sequestration potential of afforestation/reforestation systems are variable depending on species and the management systems used. The proposed session will address the issues of livelihood security, energy and carbon sequestration through short rotation forestry. It will focus on assessment and management methods, genetic improvement, economic/environmental benefits, and international collaboration on future research and development on short rotation forestry.

C-06 Forest carbon credit markets and the forest sector

Session coordinators: David Bengston, Yeo-Chang Youn, Zuomin Wen & Hemant Kumar Gupta

The session presents a review of national forest policies that a variety of countries and communities have been adapting to carbon market developments after the Kyoto Protocol. It also reviews the economic and social impacts of carbon credit systems on the forest sector. Finally, the session discusses options for the forest sector to respond to international carbon credit market development. The six (6) individual paper presentations on topics related to the theme, followed by an open forum and discussion. Posters of five to ten related case studies will complement the session.

C-07 To what extent can payments for forest environmental services be pro-poor?

Session coordinators: Stephen Garnett

Payments for Environmental Services (PES) was not initially conceptualised as an approach to alleviate poverty, and many authors insist that poverty should not be considered as a primary goal in the implementation of PES. However, others argue that conservation and poverty in developing countries cannot be separated, and that it can be detrimental to exclude poor communities from PES schemes, as this could result in ineffectiveness or failure of PES. This session aims to explore the possibility of pro-poor PES for forest environmental services. It will include an overview presentation followed by case studies on specific PES schemes. It will also include a short video presentation.

C-08 New frontiers of forest economics

Session coordinators: Shashi Kant, Martin Hostettler & Hans Heinimann

A new stream of economics based on neuroscience – behavioral economics – has moved economic analysis from assumptions-based analysis to actual human-behavior-based analysis, which is highly relevant to the forests and forestry of 21st century. Similarly, inclusion of multiple ecosystem services in forest production function introduces higher level non-linearities, and it requires economic analysis based on multiple equilibriums, and social choice theory and public choice theory provide better and appropriate frameworks for the economic analysis of multiple values – social, ecological, and economic – of forests. The main objective of this session will be to outline the new frontiers of forest economics for the 21st century. An overview presentation on this topic will be followed by presentations discussing the relevance of emerging streams of economics to forests of the future. Topics may include: (i) integration of concepts related to forests for the future and emerging streams of economics; (ii) economics of human behavior/preferences with respect to climate change and forest management; (iii) economics of ecosystem services, non-linearities, and multiple equilibriums; and (iv) multiple dimensions of forest values and public choice and social choice theories

C-09 Economic valuation of forest ecosystem services

Session coordinator: Mohammed Ellatifi

The main objectives of this session will be to analyze the economic values and valuation of forest environmental services, and payment mechanisms for conservation and sustainable management of forest goods and services, including for carbon sequestration, water resources provision, and biodiversity. The topics to be covered in the session will include: identification and definition of forest environment services; progress and issues in forest valuation methodologies; forest environmental services payment schemes and issues related to social/public choice, institutions, and decision making; Improving the links between forest environment evaluation and financing; payment for forest environment services and moral obligation to fight poverty in developing countries. The session organizer welcomes both oral and poster contributions.

C-10 Impact of global environmental change on forest ecosystem services

Session coordinators: Pavel Cudlin & Elena Paoletti

This session deals with ecosystem services in declining forest ecosystems under global environmental change, with a main focus on forest health. Forest damage caused by synergistic effects of climate and pollution factors associated with global environmental changes is resulting in changes in ecosystem functions and loss of forest ecosystem services (provisioning, supporting, regulating, socio-cultural). Our session will focus on the regulation of air quality and water balances that impact on global warming processes, and economic evaluation approaches to evaluate how decreases in forest ecosystem services may affect the measures taken to support multifunctional forest use. Topics will include: estimating changes in the most significant forest ecosystem services according to environmental change scenarios (climate and air pollution); evaluation of reductions in forest ecosystem services on the basis of the "replacement cost" method; and strategies to support multifunctional use of forests and to minimize reductions in forest ecosystem services in the face of global environmental change.

C-11 New developments in forest management accounting and reporting to ensure sustainability

Session coordinators: Hans Jöbstl & Bernhard Möhring

Management accounting in forest enterprises are essential for forest managers at the enterprise level and for forest policy makers at broader regional levels to both optimize multiple forest services and to meet future challenges. Despite the increasing demand for information on changes in forest assets and to need to inform the public about the social services of forests, current approaches often fail to fully represent forest stands values and their non-market goods and services. Further, forestry is typically not adequately represented at present in national accounting - environmental costs as well as positive/negative external effects are often neglected. In this session we will explore innovative approaches to improve accounting at the enterprise and regional levels with a focus on new developments in enterprises sustainability and social responsibility reporting. Session topics will include innovations in: (1) forestry performance accounting, (2) forest assets valuation, including risk assessment, (3) forest externalities/environmental benefits in forestry reporting, (4) economic criteria/valuations in national green accounting, and (5) sustainability reporting of individual forest companies – guidelines, indicators, and the usefulness of sustainability balanced scorecards.

C-12 Energy forests - social impacts and environmental services

Session coordinators: Jaime Amezaga

New policy drivers are underpinning forestry schemes in many regions of the world. The price rises in fossil fuels have led to a renewed interest in forestry as alternative sources of possibly lower cost bioenergy. But what are the water resource implications of these schemes? What might the costs/benefits be in relation to other societal, biodiversity and carbon sequestration factors? The session will look at some of these interacting impacts of forest energy crops on society and environmental services, and invite presentations discussing relevant methodological developments and specific examples. Case studies from India, China and Africa will deal with either forest biomass

for solid fuels or forest crops such as jatropha used for liquid biofuels. The session will open with an overview of findings of social and environmental impacts of bioenergy projects in Asia and Africa, and continue with presentation of individual papers of case studies on the interacting impacts of forest energy crops on society and environmental services.

C-13 Agroforestry: the way forward

Session coordinators: P.K. Nair & Dennis Garrity

Agroforestry is now recognized as a science-based approach to sustainable land-use. Today there is a global consensus that integration of trees on farms, ranches, and in other production landscapes, helps promote social, economic, cultural, ecological, and environmental benefits. Adoption of agroforestry innovations is envisioned to enrich and greatly enhance the achievement of the various global agendas and conventions. Thus, we are now better positioned than ever before to benefit from agroforestry. This sub-plenary session will provide a global forum for sharing and debating on the advances in agroforestry research and how they can lead to realistic action plans for capturing the promise of agroforestry. There will be three presentations, a panel discussion, followed by an exchange of ideas with participants. The major topics will include; the role of agroforestry in climate change mitigation and adaptation, enhancing environmental services from agricultural landscapes, and the bioenergy – food security nexus.

D. Asia's Forests for the Future

The growing economies of Asia are creating many challenges and opportunities, both internally and externally. Forests have many important roles to play in these countries, and the future forests of Asia will be subject to many problems or changes. This theme will examine all aspects of Asia's future forests, including but not restricted to the supply of goods and services; the role of Asian countries in the global forest sector; planned developments such as China's six key forestry programs; the role of reforestation and rehabilitation programs for desertification control and environmental remediation; urban forestry; multi-purpose forest management; forest health and productivity; interactions between water and forests; traditional forest landscape management practices such as shifting cultivation and agroforestry; forest land ownership reform, and illegal logging and associated trade.

D-01 Recreation management in protected areas: Asian perspectives

Session coordinator: Tsuchiya Toshiyuki

Most of the protected areas in Asian countries are characterized by zoning systems on multipurpose land use. Recreation managers are therefore forced to have considerations for other industries (e.g. forestry and tourism). Furthermore, the framework is complicated by peculiar patterns of land ownership and bureaucracy. This session provide a forum for discussing the issues on recreation management within the protected areas framework in Asian courtiers.

D-02 Sustainable management of mangrove forest ecosystems in Asia: focus on economic valuation

Session coordinators: Leni Camacho, Monton Jamroenprucksa, Lucrecio Rebugio & Woo Su-Young

The session on will present the significant findings of the ASEAN-Korea Environmental Cooperation Project (AKECOP) Regional Collaborative Research on economic valuation of mangrove ecosystem in the Philippines, Thailand and Vietnam, as well as other related mangrove economic valuation research in Asia (i.e., from Indonesia, Malaysia and Bangladesh or India). The session will present the estimates of the economic value of the different mangrove sites in selected Asian countries using appropriate valuation techniques. Information on the total economic value of this significant resource should contribute to their conservation and sustainable management.

D-03 Keep Asia Green: rehabilitating and restoring forest ecosystems in Asia

Session coordinators: Michael Kleine & Don Koo Lee

This session will present the results of the “Keep Asia Green” Initiative, a scientific synthesis project on the rehabilitation and restoration of forests in the Asia Pacific region. Over a period of four years, forest scientists from the various regions in Asia (i.e. Southeast Asia, Northeast Asia, South Asia, and West and Central Asia) shared their expertise and compiled papers on the history, current status, successes and failures of forest rehabilitation efforts in their countries. Presentations during the session will examine a wide array of ecological, social and economic aspects of rehabilitating and restoring forest ecosystems. Substantial experience on forest rehabilitation has been brought together in this project and has helped to derive a number of important lessons learned that are essential to further improve future sustainable management of forest resources in Asia.

D-04 Pollution and climate change impacts in Asia

Session coordinator: Shang He

Asia is fast becoming a major source of global greenhouse gas emissions, and the countries of this region - especially the larger economies - will rightly be expected to play an appropriate role in global efforts to solve this fundamental challenge facing humanity. The objectives of this session is to increase awareness about the links between air pollutants (e.g., CO₂, aerosols and particulates, tropospheric ozone) and climate change, and its impact on forests, in order to come up with scientific knowledge and harmonize effective strategies aimed to reduce the risk for forests related to air pollution and climate change

D-05 Managing Asian bamboo forest in a changing world

Session coordinators: Shen Yueqin, Zhang Yaoqi & Shashi Kant

Bamboo forest plays an important role in rural development in Asia, providing materials, food security as well as environmental services and cultural heritage. However, the emerging economies, globalization and climate change are posing new opportunities and challenges to management of bamboo forests in Asia. The session will address four specific questions. (1) How can the role of Asian bamboo forests, through carbon sequestration, be enhanced in meeting climate change obligations of Asian countries? (2) How can the role of Asian bamboo forests be improved in rural development? (3) What will be the necessary institutional, land and bamboo tenures, requirements to enhance the role of Asian bamboo forests in climate change and rural development? (4) How can we use the legacy of social and cultural perspective to promote bamboo forest development? Topics will include: (1) bamboo management for carbon sequestration; (2) bamboo carbon measurement and monitoring, (3) design and mechanism of payment schemes for bamboo carbon, (4) bamboo industry for rural development, (5) institutional reforms and bamboo management, (6) bamboo and culture.

D-06 Challenges and issues of forest management and utilization in Asian countries

Session coordinator: Lim Sang Seop

The objectives of this session are to present and discuss the challenges and opportunities facing Asia's forests, particularly the problems associated with developing economies in the current global economy; to facilitate a discourse on the role of forests in the mitigation of the severe environmental issues facing rapidly growing economies; and to reflect on the efficacy of some key forestry reforms and to what extent they are being effective in maintaining and promoting Asia's forests. This session will provide an opportunity for young Asian forest scientists to present their work on Asia's forests. A broad spectrum of aspects pertinent to Asia's forests will be addressed, encompassing the role of decentralization, China's six key forestry programs, the introduction of innovative forest practices, and the role of community forestry in developing economies.

D-07 The future of forest plantation health in Asia

Session coordinators: Jolanda Roux, Simon Lawson & Zhou Xudong

The objectives of the session will be to highlight some of the current and future threats to plantation health in Asia, posed by pathogens and pests. Asia is the most rapidly expanding region in the world

with regards to plantation forestry. The session will be in the format of oral presentations and will consist of two parts; both dealing with a mix of pathogens and insects as well as insect fungal interactions. In mixing these topics, we will hope to foster much closer relationships between forest pathologists and forest entomologists in the region (often very isolated from each other) and to highlight opportunities for collaboration. The speakers will be specifically asked to cover both insect and pathogens in their talks and to appropriately source co-authors to achieve this objective. We would hope to cover pests and pathogens both in the native and in the plantation environment and to focus on the many fascinating interactions between these domains.

D-08 Role of trees outside forests in Asia's changing forestry environment

Session coordinator: Padam Prakash Bhojvaid

In recent decades there has been a paradigm shift in forest management in Asia with emergence of three distinct forest management approaches: conservation forests for ecological services and protection and sustainable development of biodiversity; production forests for economic benefits; and restoration forests for rehabilitation of degraded wastelands. There has also been a major shift in balance of trade with respect to wood, pulp and timber products in Asia, with trees outside forests contributing a major share in the overall wood use and trade, and large-scale plantation of exotics tree species and resurgence of lesser-known native tree species in production forests. In light of these changes, the socio-economic, legal, political, environmental and technical issues related to these production systems need to be considered to balance this unique situation in the region for sustainable forest management. This session will focus on two aspects related to sustainable management of trees outside forests (in agroforestry, private and industrial commercial plantations), namely; tenure, legal and other policy issues, including private-public partnerships in Asia; and the potential of trees outside forests in climate change mitigation.

D-09 Changes in climate and air pollution – new directions in forest monitoring, research and modeling

Session coordinators: Marcus Schaub, & Marco Ferretti

The main objective of this session is to evaluate how and how well climate change and air pollution effects on forests can be detected while climate and pollution have changed. We aim to define research activities and hence monitoring requirements that may be particularly important in terms of policy. This may vary depending on the scale (site-specific catchment, national to regional and global) of the respective investigations. Presentations and discussions will focus on current and projected direct and indirect effects of changing climate and air pollution on forest ecosystems and carbon sequestration in the eastern hemisphere, appropriate monitoring system to detect air pollution and climate change effects on forests, ways in which monitoring may be targeted to address particular research and policy questions that may vary by region and with different scales, future changes related to different emission trend projections, and how drivers of these changes may be related to the expected supportive capacity of forests. The state-of-the-art on these questions and relevance to policy will be highlighted.

D-10 Mountain forestry in a changing world – challenges for research and education in continental Asia

Session coordinators: Alfred Pitterle, Brigitte Winklehner & Harald Vacik

Global change, whether generated by climate change, land use change, social or economic pressures increases the need to understand the socio-ecological processes in mountain regions. There is a similar need throughout the world to transfer scientific knowledge on mountain forests and their management to users. The session aims to demonstrate different approaches in scientific research to resolve land use conflicts in mountain forest ecosystems and demonstrate quantitative and qualitative modeling approaches to predict effects of global change on the sustainable production of forest goods and services. Presentations on the current status of research and education in mountain forestry in selected countries in continental Asia (e.g., China, Kyrgyzstan, Mongolia, Nepal) will facilitate a

discussion on the current and future demands for sustainable mountain forest management in the region.

D-11 Trends in Asian forest fire: effects on carbon, nutrient cycling and regeneration

Session coordinator: Makoto Kobayashi

Along with the changes of human activities, land-use and forest cover, fire regimes in Asian forests has been changing. Given the immense value of Asia's forests for both biodiversity conservation and carbon storage there is a need to enhance understanding the effects of changing fire regimes on these forest ecosystems. In this session, scientists engaged in the fire ecology research in Russia, China Korea, Mongolia and Indonesian forests, will present the current situations of fire regime and research results related to carbon and nutrient cycles and vegetation recovery after fire in Asia.

D-12 Forest ecosystem restoration for poverty reduction and environmental conservation in Southeast Asia

Session coordinators: Lucrecio Rebugio & Woo Su-Young

The ASEAN-Korea Environmental Cooperation Project (AKECOP) is initiative whose goal is to contribute to the sustainable and equitable forest environment management and rehabilitation of deforested areas in the tropical forest ecosystems of ASEAN Member Countries. AKECOP tries to achieve the goal through collaborative partnership in research, capacity building, and sharing of scientific and technical information to develop sound forest practices based on scientific principles and traditional knowledge to be integrated with participatory management. This session will highlight the significant results and outcomes of AKECOP research and development initiatives in Indonesia, Malaysia, and Thailand.

D-13 Biology and ecological functions of forested peatlands

Session coordinator: Tetsuya Shimamura

Forested peatlands play important roles related to environmental issues such as emission of green house gases and biodiversity conservation. While their role in carbon storage has attracted considerable interest, their biodiversity conservation values are perhaps less well appreciated. This session will bring together scientists working on all aspects of biology and ecology in forested peatlands in order to better understand the present condition and functioning of these unique ecosystems and to consider relationship between their two important ecosystem functions, carbon sequestration and preservation of biodiversity.

D-14 A comparative analysis of forest sustainability transitions in developed and developing countries

Session coordinators: Youn Yeo-Chang, Wil de Jong & Wen Tiejun

This session will highlight the significant findings from an international research project evaluating the transitions towards sustainable forestry in post-transition countries (including Finland, Japan, and Korea) and in developing countries (including China and Philippines). Comparative analyses of these countries will critically examine whether or not deforestation and transitions towards sustainable management have common underlying causes. Lastly, policy analyses for developing countries will be carried out based on these findings. The session will include an introductory overview of the study, individual presentations on the comparative analyses of the countries involved in the study, and an open forum and discussion; poster presentations are welcomed.

D-15 Biology, ecology and management of *Pinus koraiensis* in East Asia

Session coordinator: Yi Jae-Seon

Pinus koraiensis, a mountain species found in the Russian Far East, northeastern China, the Korean peninsula and Japan, is severely threatened by human disturbances and climate change, which is already affecting the distribution of natural distribution of many alpine tree species. While wild populations of this culturally and economically important pine species are declining, large areas of

plantations have been established, especially in South Korea and north-eastern China, mainly to produce timber and edible pine nuts. The objectives of this session are to: examine the latest scientific advances related to the biology, genetics and breeding, forest health issues (including effects of climate change), ecology, silviculture, and management of natural and artificial (planted) *P. koraiensis* forests; and to establish an international network for research and conservation on this species, including monitoring of plant-climate relationships, throughout East Asia.

E. Forest Products and Production Processes for a Greener Future

Creating more value with less impact is essential if we are to move towards a greener future. The philosophy of “eco-efficiency” aims at the delivery of competitively-priced goods and services that satisfy human needs and improve quality of life, while progressively reducing ecological impacts and resource use intensity throughout the life-cycle to a level compatible with the earth’s estimated carrying capacity. Contributions to this theme will examine three promising streams of research that can trigger innovation along the whole forest product value chain: (1) environmentally sound production processes, (2) “green” products and systems, and (3) mechanisms that provide incentives to producers and consumers to use environmentally sound production processes and products.

E-01 Green forest products marketing and business management

Session coordinator: Richard Vlosky

Most of the activities that are entailed in the value chain from forest to consumers fall under the umbrella of traditional marketing. Marketing is broad and includes decisions and activities in the manufacturing of forest products, their pricing in domestic and international markets, promotion and advertising for products, companies, countries and regions, and all logistics of conveying products through the product and value chains. Marketing and the associated concepts that will be presented in this session include psychometrics, economics, supply and demand sectors for forest products, competitive measures and strategies, and stakeholder participation, attitudes and perceptions about key elements of involvement in the value chain for forest products. This session will incorporate these elements into the overarching session theme of green practices in the forest products sector in developing and developed countries. The very nature of green marketing and business development touches on, and is influenced by, many exogenous issues and influences which will be included in the session discussions.

E-02 Value chain optimization in the forestry industry context

Session coordinator: Jean Favreau

Today, doing businesses require new approaches to manage the way of producing goods. Value Chain Optimization is an approach that can be used to better manage operations for companies that operate in complex environments. It is particularly valuable in businesses, like forest products manufacturing, where companies are divided into a number of separate business units. For these companies, value chain optimization provides tools that help to maximize profits across the entire organization rather than just within a single business unit. Many industrial sectors are practicing supply chain management in order to increase the net value of their final products. The forestry sector is still very focused on reducing costs. Practicing Value Chain Optimization is very challenging for the forest industry in many countries due to its specificity and the traditional way of managing the supply chain. Objectives of the session are to: (1) Present the key issues and the latest concepts of Value Chain Optimization in different parts of the world, and (2) Provide examples of functional and optimized Supply Chain Management in the forest industry

E-03 Utilization of forest biomass as raw materials for green biofuels and chemicals

Session coordinators: Choi Ingyu, Choi Joon Weon & Lee Soomin

The goal of this session is to explore the current status for utilization of biomass-based biofuels as well as technical development of biofuel conversion processes of forest biomass worldwide. In addition, this session will also deal with future potentials of biomass resources for green biomaterials to replace petroleum derived chemicals. Specifically, this session will be consider the following topics: Overview for solid biofuels in Korea; Innovative pretreatment technology of lignocellulosics; High efficient saccharification and fermentation technology for bioethanol production from cellulosic materials; Thermochemical conversion of forest biomass; Lignocellulosics as a raw material for production of green chemicals; and, Assessment of carbon economy by utilization of biomass derived biofuel

E-04 Integrating engineered biocomposites from wood and other bio-based materials to promote sustainability

Session coordinators: Marius Barbu & Salim Hiziroglu

This session will discuss how engineered wood and biocomposites can provide environmental and economic benefits to developed and emerging economies, their citizens, and promote sustainable ecosystems. This session will discuss the role of combining hybrid composites from short-rotation forestry, other non-traditional timbers, under-valued or unused agricultural fibers and waste products to produce value-added products. It will also stress the importance of simultaneously producing benefits to ecosystems, the environment, and to world citizenry. The session will provide a forum for researchers who study engineered wood products and their potential to promote environmental and economic sustainability.

E-05 Sustainability impact assessment of the forest-based sector

Session coordinators: Kaj Rosén, Jean-Michel Carnus & Margarida Tomé

A number of methods and evaluation tools have been developed to assess the environmental performance of industrial activities, including forestry and forest-based industry, although few take into account all aspects of sustainability. There is, therefore, a need for new tools for sustainability impact assessment of forestry and forest-based industry operations to support political and cooperative development strategies for a sustainable development of the society. The Session will explore new approaches for sustainability impact assessment (SIA) of the forest-based sector. The need for and applicability of SIA as a tool to evaluate the complete business sectors from all aspects of sustainable development will be discussed. Topics in this session will include: background, motives and methods for assessing sustainability impact of industrial activities; ToSIA – the EFORWOOD approach to sustainability impact assessment; case studies from local to global scales; and evaluation and stakeholder involvement in SIA.

E-06 Properties and utilization of plantation timbers

Session coordinators: KeeSeng Gan & Pekka Saranpää

The demand for wood as a renewable and sustainable construction material as well as for other uses, including energy generation, is increasing. Plantations provide a source of material that will meet this demand and offer an alternative to the exploitation of old growth/natural forests, while at the same time creating a carbon sink. Various wood uses have different raw material requirements, and therefore wood quality is a relative term. While good knowledge exists on the effects of silvicultural practices and environmental characteristics on growth, less is known on how these affect wood properties and utilization. Such knowledge is required as uses are increasingly demanding raw materials with particular wood properties. The ability to meet the needs of various wood users now and into the future is a key challenge for the forest plantation sector.

E-07 Sensing wood properties and allocation of round wood with respect to product requirements

Session coordinator: Gero Becker

For most industries, process efficiency and product quality depend to a large extent on the specific properties of the raw material input. Using a well defined raw material for a given specific production process and product makes the process more cost effective and the product more competitive. While industrial demands are both very specific and well defined, the round wood coming from forests varies widely with tree species, age, dimension, quality and structure properties. This diversity is even more pronounced where modern silvicultural concepts (mixed, uneven stands, close-to-nature forestry) are applied. A product-specific allocation of the raw material could radically improve yield, profitability, new product development and customer orientation for the wood product companies. The challenge is to map these properties at the stand level and to develop an accessible and flexible geo-referenced database for forest industry use. This session will consider these issues and technological developments through individual papers presentations and/or posters and a moderated panel discussion

E-08 Surface processing and treatment technologies for wood and wood based materials to enhance durability and performance

Session coordinator: Bernie Dawson

The development of surface treatments to improve the durability of wood-based products is a hot topic with big challenges for the forest products research community. What are the opportunities now on the horizon? For example, how are sustainability issues and preference for renewable resources impacting improvements based on nanotechnology treatments? This session will present the latest research in surface improvements and performance enhancements to wood or wood-based products, through mechanical, chemical and other means, and to examine their interaction and durability and performance. The session will include a combination of oral and poster presentations on this rapidly changing field.

E-09 Enhancement of service life of wood in an environmentally conscious global society

Session coordinators: Andrew H.H. Wong, D. Pascal Kamden & Joran Jermer

This joint IUFRO-IRG (International Research Group on Wood Protection) symposium will discuss aspects of wood protection and extension of service life to produce environmentally acceptable *Green* wood products with high value added for tropical and temperate wood species. Presentations will review pertinent information on the methods and processes to evaluate the natural durability and the service life of wood products as well as the emerging technologies and designs to increase the utility of wood and wood products. The impact of wood protection technology in carbon sequestration and forest ecosystem sustainability will also be discussed. These sessions will provide a unique forum for researchers working in the areas of wood chemistry and physics, protection of tropical and temperate species and natural durability and life cycle of wood species.

F. Emerging Technologies in the Forest Sector

Traditional approaches to forest management, product manufacturing and biomaterial applications are continually being challenged. This theme seeks to highlight some of the more promising emerging technologies leading towards improved tree growth, forest health, and forest product utilization for bio-energy, human health and nutrition, as well as forest monitoring and modelling. Contributions will cover topics such as advanced breeding techniques, molecular genetics and genomics, nanotechnology; optimised energy usage; increased recovery using feature detection; integrated biorefining as well as high-value by-products. Emerging technologies in forest monitoring include 3D remote sensing of the forests, based on physical and empirical approaches; very high resolution remote sensing techniques for carbon balance and REDD monitoring; and new approaches in forest decision support systems.

F-01 Scientific forest monitoring-the basis for political decision making

Session coordinator: Konstantin von Teuffel

Scientific forest monitoring provides for data and information relevant for policy decisions on almost all levels. The session aims at discussing political demands, methodologies in collecting, structuring, processing, storing and availability as well as the results of forest related information based on monitoring. This includes natural resources, economic and social data from gene to landscape and beyond. The session will pick up the results of the eDirectors Forum held in Buenos Aires in October 2009 where the same issues will be discussed in an official session more from the demand side (politicians and decision makers in forestry). It is foreseen to derive a catalogue of guidelines for state of the art scientific forest monitoring. The format of the session is to have short statements by invited speakers which will be opened out into a moderated discussion among the panelists as well as the audience. Questions to be discussed include: How are politically relevant monitoring issues selected?; Who decides upon the issues?; Where is the information stored and processed?; Who has/should have access to the data (and in which format)?; Who pays?

F-02 Contemporary frontiers in forest inventory and assessment using successive remotely sensed data

Session coordinator: Temesgen Hailemariam & Cris Brack

Forest management and silvicultural prescriptions have become increasingly complex, relying on analyses of various layers of vegetation, microclimate, and micro-site parameters. The development of layers requires detailed knowledge of forest structure, composition, and diversity. Emerging technologies such as light detection and ranging (LiDAR) offer unprecedented opportunities to quantify forest attributes, identify change, and tackle other emerging challenges. The purpose of this session is to facilitate the exchange of ideas between researchers, scientists, and practitioners with common interests to improve inferences in forest resource inventories and assessments using successive remotely sensed data. The session provides a forum for discussion of current research findings and the exchange of ideas related to the following questions: (1) How can successive remotely sensed data be collected and analyzed efficiently to advance precision in forestry? (2) What magnitude of changes in forest attributes is detectable using successive remotely sensed data? (3) What are the accuracy and precision of changes detected with successive remotely sensed data? (4) Can successive remotely sensed data be used to characterize both linear and nonlinear forest attributes including stand structure and diversity? (5) What are some of the challenges and opportunities in using successive remotely sensed data?

F-03 Opportunities for nanotechnology in wood products industries

Session coordinator: Jerrold Winandy

The objective of this session is to explore new developments in research and potential applications of nanotechnology across various wood products industries (surface coatings; wood preservation, construction, etc). The session will include four or five oral presentations from leaders in the field and a poster session.

F-04 Achievements in seed orchards, somatic embryogenesis and seed science for forest productivity and conservation

Session coordinator: Kang Kyu-Suk

In the past two decades, there have been significant advances in seed orchard management, seed science, and tissue culture, offering new opportunities and possibilities to enhance tree breeding and rapid deployment of improved stock. These advances must be carefully integrated in order to promote forestry practices aimed at sustainable production of wood and fiber balanced with socioeconomic needs, biodiversity, and adaptation to climate change. The objectives of this session are to present recent advances in seed orchard management, seed science and somatic embryogenesis and to integrate them into high-value forestry, genetic resource conservation and environmental restoration programs. The general topics of this session include (1) Tree breeding and seed orchard

management, (2) Somatic embryogenesis of trees and its application and (3) Advances in seed physiology and technology.

F-05 Advances in handling missing data in sustainable forest management

Session coordinators: Temesgen Hailemariam, Valerie LeMay & Göran Ståhl

Forest management decisions are rarely based on single objectives, and hence, managing forested landscapes requires information to support several forest management goals such as timber production, wildlife habitat, fire hazard mitigation, biodiversity, and carbon balance. Timely, accurate, and precise information about the entire forest resource is needed. However, missing data on some units limits the sustainable management of forests. Missing data is a universal problem in forest inventory, monitoring, and planning. To alleviate this problem, various methods have been developed for forestry applications. Some of these methods include complete-case analysis, weighting procedures, and imputation-based approaches. The purpose of the session is to bring together researchers, scientists, and practitioners with common research interests and to exchange ideas related to some of the challenges and opportunities of handling missing data in forestry applications and current research findings to mitigate missing data problems in Sustainable Forest Management.

F-06 Remote sensing in carbon balance evaluation and monitoring

Session coordinator: Tomasz Zawila-Niedzwiecki

An operational system to quantify carbon stock and stock changes on national and continental scales will be essential to countries for meeting their international climate change commitments to monitor and improve the source-sink function of its forests. Remote sensing (SAR and optical) represents an ideal instrument for the objective and standardized assessment of carbon stocks. In comparison to other inventory systems it offers a highly cost efficient alternative. The potential of satellite remote sensing for carbon stock assessment has been demonstrated by many investigations and the development of innovative models to improve remote sensing based inventory tools is currently under way. Many studies clearly demonstrated that classifications can be significantly improved when remote sensing data and terrestrial inventories are combined. The proposed session will consider papers and posters demonstrating innovative methods for carbon assessment that are based both on SAR and optical airborne or satellite remote sensing data.

F-07 Forest monitoring and inventories by means of LIDAR, photogrammetry and HR satellite data

Session coordinator: Mathias Schardt

Effective forest monitoring is necessary to help decision makers to take the right measures in order to assure the ecological and economic health of forests today and in future. As conventional monitoring and inventory methods are time-intensive and expensive forest authorities ask for cost-effective methods. The availability of new and innovative sensor systems such as high resolution remote sensing data, laserscanning and digital photogrammetry will significantly increase the potential of remote sensing, allowing the establishment of monitoring systems at different scales and level of detail. The combination of information derived from these techniques and the integration with other data sources using geographic information systems (GIS) will enhance the results of forest monitoring and inventory projects and, therefore, improve practical work processes. The proposed session will review both operational applications and innovative techniques in the field of remote sensing data assessment and analyses.

F-08 Innovation in the forest sector – maximizing the sector's competitiveness

Session coordinators: Lyndall Bull, Eric Hansen & Ewald Rametsteiner

This session will provide insight into the successful adoption and application of innovation and technology in the forest sector, imperative improving its competitiveness and take advantage of emerging technologies and opportunities. The session objectives are: (1) to provide an up-to-date overview of innovation research and adoption in the forest sector ranging from the forest floor to the retail floor, and (2) to provide insight into relationships between innovation and other aspects of forest sector firms such as performance, competitiveness, social responsibility, entrepreneurship, etc. Session topics will include: Entrepreneurship; New product development; Knowledge transfer; Management; Innovation in manufacturing; Environmental services and innovation; Social responsibility; Update on innovation research in the forest sector; Competitiveness; Innovation adoption in the forest sector

F-09 Forest biomass utilization for bio-energy: technology, economics and environment

Session coordinators: Woodam Chung & Greg Jones

Forest lands worldwide represent a large source of underutilized forest biomass that could become an important feedstock for bioenergy. The overall objective of this session is to introduce emerging technologies for forest biomass handling and utilization for bioenergy and discuss the economic and environmental effects of biomass utilization. Topics to be covered in this session include 1) various technologies for forest biomass feedstock production, handling, and utilization, 2) financial and economic feasibility of forest biomass utilization, 3) environmental effects of removing biomass, and 4) contributions that utilizing forest biomass for energy can make toward off-setting the use of fossil fuels and lowering carbon and greenhouse gas emissions.

F-10 Managing the data deluge: the challenge of emerging technologies

Session coordinator: Roger Mills

Emerging technologies are greatly simplifying the collection, analysis and publication of data for the researcher and end-user, often reducing or removing the need for mediation by IT professionals. Partly as a result the volume of data being collected worldwide is greatly expanding. Locating, selecting, archiving and indexing this mountain of data for re-use presents major new challenges which are being researched by many organisations.. This session will offer a brief synthesis of this research and guidelines derived from it, and provide participants with a toolkit for devising a successful data management plan for their own data to ensure it remains findable, accessible and usable into the future. Practical demonstrations and the opportunity to contribute to a user needs assessment of researchers' requirements will accompany the session. A panel of speakers will provide the synthesis of research in a mix of short presentations and discussion, supplemented by voluntary papers on specific examples, and by posters giving more details of specific topics. If feasible, the session will be supplemented by an 'information fair' running throughout the meeting where specific technologies can be demonstrated and users given opportunity for hands-on practice.

F-11 Detecting, monitoring and modeling forest fire and carbon emission using remote sensing and GIS

Session coordinator: Yousif Ali Hussin

In the last two decades, fire has become one of the greatest threats to world forests, and it has an extraordinary influence on forest vegetation and on dependent fauna, soils, stream flow, air quality and climate. Fire is now recognized as a significant global source of atmospheric carbon emission, contributing more than half of all the carbon released into the atmosphere. Accurate detection, monitoring and modeling of forest fire is needed, and reliable estimates of carbon emission from forest fires are crucial. The objectives of the session are: (1) to present the state of the art: data, methods and techniques of remote sensing and geographic information system (GIS) systems used to accurately detect, monitor and model forest fire and carbon emissions, and (2) to improve our

understanding of forest fire and its effects on climate and the carbon cycle dynamics. Contributions for oral and poster presentations are welcomed.

G. Frontiers in Forest and Tree Health

The health of trees in forests and plantations is threatened world-wide due to damage caused by insect pests, pathogens and air pollution. This is being increasingly driven by host shifts for pests and pathogens and the introduction of these agents into areas where they previously did not occur. In addition there are growing examples of the negative impact of climate change on forests and there is growing evidence of close interactions between climate change and damage to trees by pests and pathogens. This theme seeks to draw attention to the most important elements of contemporary research dealing with all aspects of tree health.

G-01 Forest health in a changing environment

Session coordinators: Elena Paoletti & Mike Wingfield

Responses of forest ecosystems to abiotic and biotic stressors are affected by the recently occurring climatic changes. Atmospheric changes in pollution and climate affect tree physiology, phenology and growth, and modify tree susceptibility to the biotic stressors - insects and diseases. Climate change is also directly affecting insect and pathogen species ranges and outbreaks. All these factors, individually and in combination, may affect forest growth, health and sustainability. The main aim of this session is to update the state of the art of forest health in this changing environment, with focus on pollutants, pathogens and pests. Poster presentations are welcome.

G-02 New insights into roles of ophiostomatoid fungi in bark beetle-fungus symbioses

Session coordinators: Diana Six & Mike Wingfield

While extensive research has been conducted on bark beetle-fungal symbioses over the last century, there remains considerable controversy over the role fungal associates play in the ecology of their hosts. The classic paradigm postulating that the fungi act as virulent pathogens that aid in the killing of trees is increasingly being questioned. Competing hypotheses have emerged and are being tested with intriguing results. In this session, speakers conducting cutting edge research on bark beetle-fungus symbioses from around the world will present their work. The session will be organized as a series of individual papers. We envision a collaborative synthesis paper to be written soon after the session for submission to a journal with broad readership such as *BioScience* or *TREE*.

G-03 Effect of multiple ecosystem stressors on tree and forest ecosystem health

Session coordinator: Nancy Grulke

Current tree and forest health assessments are designed to detect cause-effect responses, usually with regard to a single stressor. However, drought stress may predispose trees to bark beetle, and may exacerbate observed ozone injury. Conversely, excess nitrogen deposition is often concurrent with moderately high ozone exposure, but it can ameliorate the expression of foliar ozone injury. This session is proposed to increase awareness of the effect of concurrent stressors on tree and forest health. We solicit submissions that exemplify concurrent environmental stressors (such as drought, flooding, excess nitrogen deposition, elevated ozone exposure), or environmental enhancers (elevated CO₂, low to moderate nitrogen deposition), or biotic stressors (parasites, pests, invasive species, human behaviors), and their additive or synergistic effect on biological responses of trees and forest ecosystems.

G-04 The growing threat of Australian insect pests to world eucalyptus plantation forestry

Session coordinator: Simon Lawson

Eucalypt plantations are greatly expanding worldwide for production of high quality, fast growing fibre, solid timber, pulp and fuel wood. In recent years there has been a rapid increase in the number of Australian native insects invading eucalypt plantations around the world. This session will address

methods that have been used to combat this threat, both historically through classical biological control, and more recently through the use of molecular techniques that can help in determining the origin and spread of pests. The use of a pathway approach to reducing the risk of spread of these insects will also be considered. The session objective is to (a) review the past movements of Australian eucalypt insect pests around the world and their impact on plantation productivity, (b) provide case examples focusing on some of the first of these insects to invade overseas (e.g. *Phoracantha semipunctata* & *P. recurva*, and *Gonipterus scutellatus*) and more recent movements (*Leptocybe invasa* and *Thaumastocoris peregrinus*), and (c) review the current insect pest situation in eucalypt plantations in Australia and the potential threat these pose to eucalypts worldwide.

G-05 Synergy in forest threats: symbiotic interactions and invasives

Session coordinator: Kier Klepzig

This session will address the congress theme of Frontiers in Forest and Tree Health through the perspective of symbiotic interactions among plant pests, in particular insects and the microbes they carry. The session will use the presentation of individual papers and group discussion to address the following objectives: 1. An overall framework for considering the pestilence of associations between insects and microbes in trees. 2. The roles microbes play in mediating interactions between trees and their parasites. 3. Predicting invasiveness in and among organisms using evolution, life history and environment. 4. Dynamics of invasive species and their control in new habitats.

G-06 Alien invasive pathogens: threats to forest ecosystem integrity and services

Session coordinators: Steve Woodward & Ned Klopfenstein

Forest ecosystems throughout the world are under unprecedented threat from alien invasive pathogens associated in part from increased global trade, population mobility and tourism. While increasing numbers of alien pests and pathogens are being intercepted at ports of entry, these probably represent only a small proportion of the alien organisms arriving from other continents, and escapes into natural and plantation forest ecosystems are occurring. Climate change can be expected to increase the chances of permanent establishment of alien pathogens in locations that would have been unsuitable in the recent past. Interactions between climate change, including likely increases in both mean temperatures and precipitation, and pathogens (indigenous or alien) will have serious impacts on host susceptibility to attack and a large number of novel, unprecedented forest health problems are likely to occur in the near future. These threats will lead to reductions in forest primary production, with consequent losses in yields, biodiversity and other multi-functional roles of these ecosystems.

G-07 Impacts of interacting disturbances on forest health in the boreal zone

Session coordinator: Douglas McRae

Boreal forest health is at risk from changes in disturbance regimes associated with climate change, which is expected to be most rapid in the boreal and arctic regions. Different scenarios project increases in natural disturbances, such as wildfires, insect, disease, wind damage, flooding, and winter damage, which may be expected to affect the health of these forests. It is important to understand the potential consequences of changing disturbance patterns for boreal forests, which are a valuable natural resource that provides habitat for many species. The focus of this session will be to understand the current impacts of key disturbances on the boreal forest and to project their future impacts.

G-08 Invasive alien species: economic and environmental impacts on forest ecosystems

Session coordinator: David Langor

The objective of the session will be to share and discuss the newest knowledge concerning the economic and environmental impacts of Invasive Alien Species (IAS) in forests throughout the world. The speakers in this session will be charged to use the most current research and science syntheses to illustrate the threat that IAS present to achieving forest ecosystem sustainability around the world. Some talks will demonstrate the economic implications of forest invasions in terms of impacts on

productivity, products and international trade. Other talks will illustrate the impacts of IAS on the broader forest environment (e.g., biodiversity, functions). Each speaker will be encouraged to directly address management and policy implications of their research, and to highlight opportunities for mitigation of impacts.

G-09 Semiochemical based monitoring of forest health

Session coordinator: Zhang Zhen & Steven Seybold

Pest population monitoring is an important task in forest health surveillance. Semiochemical based monitoring is applicable over a wide range of population sizes, species specific and relatively inexpensive and easy to deploy. So far, semiochemical based population monitoring has shown mixed results. How to make a reliable monitoring protocol for a specific pest species is a key issue. The session will combine presentation of individual papers and/or posters with moderated panel discussion.

G-10 Trends in wood and bark borer invasions and effects of policy

Session coordinators: Eckehard Brockerhoff & Robert Haack

Invasions of wood borers and bark beetles have caused considerable environmental and economic damage worldwide. These invasions have been facilitated by widespread use of wood packaging materials and movement of live plants in international trade. Much effort has been directed at developing international trade policies to reduce the arrival and establishment of such pests, such as ISPM-15 for wood packaging. The objectives of this session are to review the impacts of such invaders by highlighting several case studies, to examine important relationships with key pathways, and to assess the effectiveness, costs and benefits of ISPM15 and other relevant policies.

G-11 Molecular ecological and evolutionary perspectives on changing populations of forest insects and their symbionts

Session coordinator: Bernard Slippers

Rapid changes in ranges and dynamics of forest pest populations can have devastating effects on forest health. These changes are often driven by the increasing global movement of the insects by humans and global climate change. This symposium will explore the important role of DNA sequencing, microsatellite markers and other molecular based techniques, applied to the insects or their symbionts, to understand the patterns of these changes, as well as the factors that influence them. These tools are helping to characterize the species (often cryptic) diversity which forms the foundation for understanding these phenomena, and reveal the diversity and spatial structure, or the lack thereof, in introduced and native populations of pests, symbionts and biological control agents alike. These patterns of diversity are particularly useful to help elucidate the origins and introduction history of these populations, as well as to understand the evolutionary forces that act on them. This information is critical to support the growing need to manage these population changes through biological control and other management strategies.

G-12 Oak decline in the world

Session coordinator: Naoto Kamata & Kazuyoshi Futai

Oaks (family Fagaceae) are globally facing serious pest and disease problems. Since the session entitled "Recent Problems in Oak Decline" held during IUFRO Congress in Tampere, Finland in 1995, the situation has worsened. Oak mortality caused by the gypsy moth defoliation extends beyond North America. Oak decline caused by *Phytophthora* spp. has been spreading in Europe and North America. In Asia, oak wilt caused by Platypoid beetle/*Raffaelea* pest complexes have newly emerged in Japan and Korea. *Tubakia* leaf spot, a fungal disease, also caused the decline of bur oak in the Upper Midwest in US. There have been similar reports also from Europe. The feeding activity of the larvae of a buprestid beetle, *Agilus coxalis*, was found to be the cause of oak decline in southern California. Unidentified oak decline was found in Primorsky Krai, Russian Far East. This session overviews the present status of oak decline in the world..

G-13 Advances in exotic forest pest surveillance and monitoring
Session coordinator: Jon Sweeney

Invasive exotic pests are considered to be the second greatest threat to forest biodiversity behind habitat loss and have significant direct impacts on forest and tree health. Early detection of established exotic pests is essential for their management, containment and potential eradication. This session will focus on current research on new and improved methods for early detection, surveys and delimitation of exotic forest insects.

G-14 Ecology and management of pine wood nematode in the face of climate change
Session coordinators: Yeong-jin Chung & Han Hyerim

Pine wilt disease is one of the major forest diseases in East Asian countries, but now it is also spreading in continental Europe. The pine wood nematode, *Bursaphelenchus xylophilus*, the causative agent of pine wilt disease, is transmitted by insect vector, *Monochamus* spp.. The objective of this session is to discuss the future of pine wilt disease and its management as affected by climate change. Climate change will accompany various changes in host trees, nematode, vector insect and their inter-relationship. Therefore, the topics in this session will include ecological changes of forest (such as changes in forest spatial distribution), host-parasite interaction, disease mechanism (e.g., simulation of disease spreading), monitoring system (e.g., early detection of asymptomatic trees), biological and ecological characteristics of nematode and vector (life cycle, development, distribution), and management (legal control, chemical & biological control).

G-15 Cork Oak forest degradation causes and sustainable development in western Mediterranean countries
Session coordinators: Mohammed Nejib Rejeb, Abdelhamid Khaldi & Woo Su-Young

This session highlights significant results and outcomes of the research and development initiatives of several West Mediterranean countries, including those of the Korean-Tunisian research project (KOTUCOP). The session will highlight research results about cork oak forest decline and their impacts in the Mediterranean region as well as restoration of these forest ecosystems. The session will focus on applied research and will highlight the benefits of international collaboration.

G-16 Climate factors and tree susceptibility/resistance to insects and pathogens
Session coordinators: François Lieutier & Dan Herms

Increasing evidence indicates that climate change, including changes in temperature, precipitation and atmospheric composition is already affecting interactions between trees and their aggressors, increasing risks to health of urban, plantation, and natural forests. Tree resistance/susceptibility is a basic component of these interactions and has consequences on population dynamics of the aggressors. It can be studied by analysis of host quality (ranging from physical or chemical parameters to phenological or geographical characteristics) or by aggressors' performances on their hosts. The proposed session will focus on these aspects, while considering different guilds of aggressors and different intensities of climatic factors, as well as the relations with the aggressors' population dynamics. It will consist of both invited and voluntary presentations. Topics to be covered include: Modulation of insects and pathogens population dynamics through effects of environmental factors on host tree quality and aggressors' performances; Climate factors and tree resistance/susceptibility to boring insects and wood pathogens; Climate factors and tree resistance/susceptibility to foliar pathogens and defoliating and sap-sucking insects

G-17 Managing cone and seed insects to preserve the regeneration of future forests
Session coordinator: Jean-Noël Candau

Cone and seed insects are considered the most important seed predators during the pre-dispersal phase of seed development. Seed losses might result from damages caused by these insects to buds,

flowers, cones or seeds themselves. Although they received little attention until recently, these insects are important factors in forest and tree health and their economic and ecological impact is a source of increasing concern to foresters. Damages have been particularly severe in seed orchards hindering genetic improvement programs and reforestation projects. As the need for improved seeds will likely increase to adapt to our changing world, the impact of these insects will continue to increase. This session will discuss recent advances in cone and seed insect research and their impact on forest natural regeneration and seed orchards management. A special focus will be given to genetic differences in cone and seed pest susceptibility and the exploitation of clonal differences for pest management. Topics will also include the biology/ecology of a specific species or a group of species, invasive species, novel monitoring techniques and pest management.

G-18 Diseases and insects in pines threatening global forest health in the 21st century

Session coordinators: Lee Kyung Joon & Kang Ho Duck

Pines are one of the most important tree species in forestry of the world. Climate changes and forest ecosystem conditions are favoring outbreaks of diseases and insect pests around the world. Unfortunately recent increase in the global trade and frequent international exchanges of visitors have made the situation worse increasing the frequency of introductions of non-indigenous diseases and insects. The objectives of this session will be to discuss and share new information on the common serious diseases and insects that affect the health of pine forests of the world in relation to rapidly changing forest ecosystem conditions. The diseases and pests of interest would include, among others, white pine blister rust, pitch canker, *Phytophthora* wilt, *Diplodia* shoot blight, *Armillaria* root rots, bark beetles, sawflies, pine caterpillar, and *Sirex* woodwasps. The full papers presented at the symposium will be published as a monograph by Korea Forest Society

G-19 Forest dieback caused by novel ambrosia beetle/*Raffaelea* pest complexes

Session coordinators: Kazuyoshi Futai & Naoto Kamata

Ambrosia beetle were earlier considered to be a secondary pest infesting weakened, dying, or dead trees, and logs. A few species, however, were known to attack apparently healthy living trees. Recent papers report on ambrosia beetles that are associated with fungi belonging to the genus *Raffaelea*, can infest, and kill, healthy-looking trees. This type of disease has been increasing recently. Examples include Japanese oak wilt, where *R. quercivora* carried by *Platypus quercivorus* in deciduous and evergreen fagaceous species, is still prevalent and spreading in Japan; *Platypus koryoensis/Raffaelea* sp. in deciduous oaks (mostly *Q. mongolica*) in Korea; Laurel wilt, in which *R. lauricola* is vectored by *Xyleborus glabratus* is spreading rapidly in the southeastern USA; and *Megaplatypus mutates*, associated with *R. santoroi* (native to subtropical and tropical South America), has been spreading into temperate regions, and threaten world poplar, fruit trees. This session focuses on ambrosia beetle/*Raffaelea* pest complexes which are spreading worldwide and causing serious damage (dieback) to various species of trees.

H. Forests, Communities and Cultures

Forests and woodlands benefit rural communities in many ways, providing economic opportunities and sustaining social, cultural and spiritual values based on people's multi-faceted inter-generational ties to the land. Contributions to this theme will explore the historical and potential importance of traditional (local and indigenous) knowledge in forest management and maintenance of biocultural diversity; community management of forests and woodlands; the role of small-scale forest-based enterprises in an increasingly globalized world; and emerging issues and opportunities for forest-dependent local and indigenous communities in light of the global trend towards decentralization of forest management authority.

H-01 Income from smallholder forestry - can it be a driver of poverty alleviation?

Session coordinators: Verina Ingram

The objective of this session is to review experience on the role of smallholder forestry in poverty alleviation. It will cover smallholder plantations, as well as incomes from natural forests and NTFPs. A

series of individual papers will be presented based on detailed case-studies of particular forestry products or forestry interventions, followed by a moderated panel discussion. The panel discussion will be based on a series of principles distilled from the case studies. The panel will include stakeholders from the case study countries.

H-02 Promoting urban forest services in partnership between scientists and communities

Session coordinator: Cecil Konijnendijk

This highly interactive session will focus on innovative research in close collaboration with cities across the world, aimed at developing multifunctional urban and peri-urban green structures. Emphasis will be on issues such as promoting the ecosystem services provided by urban forests, planning of multifunctional green structures and contributing to city competitiveness in a changing world. But central theme would be to present and discuss successful R&D partnerships between urban forestry scientists, cities and urban communities across the globe. Session speakers will represent academia as well as government agencies and NGOs.

H-03 Global comparative analysis of local incomes from the forests

Session coordinator: Arild Angelsen

Forest resources are crucial to the livelihoods of millions of poor people worldwide. But just how important are forests for poverty alleviation? What is their role as safety nets and regular gap fillers relative to the role as a possible path out of poverty? Surprisingly, there is a lack of data to answer this and other related questions. This session will focus on CIFOR's Poverty Environment Network (PEN) a tropics-wide (26 countries) comprehensive, comparative, quantitative review of the role of tropical forests in poverty alleviation. This sessions will briefly introduce the PEN project, and present papers reporting the results of the global analysis on the role of forest in rural livelihoods. Other speakers involved in this project will present case studies from Bangladesh, Uganda, Nigeria and Guatemala. In addition to the broad topic of forest and poverty, presentations will focus on the impact of forest decentralization (in Uganda and Nigeria) and market linkages (in Bangladesh and Guatemala).

H-04 Linking forest based enterprises, collective action, and livelihoods in the African dry forests

Session coordinators: Davison Gumbo

Africa's dry forests are home to 235 million people and cover over 43% of the continent's lands surface, making them a unique and valuable resource on which many people's livelihoods are anchored. Africa's forests, dry forests included, contribute close to 6% to the GDP but this figure masks the true value of dry forests' contribution to rural livelihoods. In this session we will examine the potential of dry forests to provide a sustainable livelihood to local households and communities, and in particular explore the necessary conditions and support mechanisms needed to enable viable forest based enterprises that will benefit forests and people to be established. Topics to be covered include certification, empowerment of producer organisations and policy change. Five speakers will cover these important themes.

H-05 Can forest tenure reforms help achieve sustainable forest management and poverty alleviation?

Session coordinator: Jinlong Liu, Qiang Ma & Jacek P. Siry

The purpose of this session is to share knowledge and experience about forest tenure worldwide and how it can be used promote sustainable forest management and community/rural area development, to stimulate academic debate about forest tenure reforms, to improve the awareness of decision-makers about forest tenure policy tools, and to provide current research results supporting effective forest tenure reforms worldwide. The session will include presentation of individual papers from different continents followed by an open forum and discussion; poster contributions are welcomed.

H-06 Human dimension solutions to difficult forest problems

Session coordinator: Taylor Stein

From protecting endangered species in managed ecosystems to planning for beneficial tourism opportunities in protected areas, social science research is becoming more important in finding answers to difficult forest management issues. This session will highlight research that helps to understand the role tourism plays in forest planning as well as social science research that provides important information to problems traditionally solved without an understanding of the human element. As managers and researchers take an ecosystem and adaptive approach to managing and understanding forest ecosystems, the human element of those projects is becoming an ever-present necessity in order to attain holistic and useful solutions to complex forest problems. Additionally, nature-based tourism and recreation, which directly places human beings into forest environments, requires quality social science to be integrated with good ecological understanding. Presentations will discuss the social science methods used to generate results that led to practical natural resource management solutions. Examples include how managers used a better understanding of motorized recreation users to identify appropriate management techniques that minimized severe ecological impacts in a national forest, and why understanding community capacity at the local level is a critical first step in improving conservation of endangered species and critical habitats.

H-07 International developments in the administration of publicly-funded forest research: challenges and opportunities.

Session coordinator: Gordon M. Hickey

This session will examine the natural tension that exists between the 'purchaser' (the decision-maker) and 'provider' (the researcher) of publicly funded forest-related scientific research in different jurisdictions. Presenting the results of recent empirical research, this session will reveal some of the contemporary opportunities and challenges facing publicly funded scientific research programmes at different levels of government internationally. More specifically, this session will offer diverse organizational perspectives on the following issues: Funding pathways (including public and private partnerships) that enable forest research; Managing decision-maker and researcher satisfaction in publicly-funded forest research contexts; Measures of research success and relevance (i.e., scientific versus public impact factor); Demand for inter- and trans-boundary governance and research; External pressures on setting forest research directions; and Information pathways for improving knowledge transfer. This session will involve the oral presentation of up to six individual papers, followed by a panel Q&A session. Posters will also be accepted.

H-08 Contribution of political theory to policies for sustainable use of forest resources

Session coordinators: Dodik Nurrochmat & Maria Brockhaus

The objective of this session is to critically evaluate whether political theory can meet expectations that forest policy theory can support policy formulation for sustainable use of forest resources in practice. Presentations will focus on how validated theory has or has not informed practice and shaped the design of recent forest policies. The session will begin with two overview talks, the first dealing with the state-of-art of theory in forest policy research, and the second outlining different ways through which theoretical insights can become part of forest policy in practice. Presented case studies will illustrate how specific theories have been used in recent forest policy development in a number of areas relevant to several Congress themes, including but not limited to Biodiversity Conservation and Sustainable Use of Forest Resource, Forests and Climate Change, and Forest Environmental Services.

H-09 Future of forests – responding to global changes

Session coordinator: Gerardo Mery

The session will present the main findings of the book entitled *Future of Forests –Responding to Global Changes* involving more than one hundred scientists from around the world. The session will address the significant drivers of change affecting forests and forestry globally, particularly the

sustainable use of forests. It will focus on climate change, its projected impacts, forest adaptation and mitigation measures as well as different social and economic drivers of change, emphasizing that many of them originate from outside the forest sector; the agricultural, energy mining and infrastructure sectors can have far reaching effects on forests. In looking for options to address the changes in forests and forestry the session will focus on what appears to be the most promising institutional and governance settings with which to address the drivers of change, ameliorate problems, and provide for sustainable forest management around the globe. We will focus particularly on how various institutions at global, national and local levels better include and empower forest stakeholders (e.g. marginalized groups, communities and indigenous peoples) in forest management.

H-10 Wood and forest culture: yesterday's lessons and today's impact

Session coordinators: Howard Rosen & Chun Young Woo

The objective of the session is to better understand the historical, religious, artistic and other social values of wood and forest culture. The talks will emphasize the economic, environmental, and scientific impacts to different regions or countries in the world as a result of these social values. Forests have provided a rich heritage to many parts of the world, as reflected in the ancient and modern wood trade, contemporary art and literature, and the wide use of forests and forest products. Different regions of the world have developed distinct forest cultural tradition and utilization of various products from the forest. The session may include both oral and poster presentations

H-11 Improving forestry education: innovative views of students and teaching staff

Session coordinators: Michaël Rivoire & Siegfried Lewark

Knowledgeable and competent graduates are crucial for professional success in forestry and related fields as well as for successful research. Therefore quality of learning and teaching is of outmost importance. This session will consider the findings of an enquiry of forestry students and teaching staff carried out by the International Forestry Students Association (IFSA) on the status and means of improvement of forest sciences education. The key questions to be considered during this session, through presented papers and a moderated panel discussion, are: How are sustainable development and education linked? Is forestry education willing to follow the development of new technologies? Is it desirable, and how can it be achieved? Is the scope of education global or local? What are the geographical and topical limits of forestry education (how forestry is linked to cultural, local constraints; what is the difference between forestry education and environmental, landscape or even agricultural education?). What are the most innovative perspectives of research on forest science education? Poster presentations on the topics covered in this session are also encouraged.

H-12 Cultural values and sustainable forest management: strategies and actions

Session coordinators: Mauro Agnoletti & Steven Anderson

The issue of cultural and social values is slowly passing from theoretical discussions to political initiatives developing strategies and actions for their incorporation in forest policies, planning and management. While there have been important activities in this direction, particularly in Europe, the issue has not received the same attention in other parts of the world. In most developing countries, for example, there are significant contradictions between official forestry, nature protection strategies and local culture, especially traditional practices related to the life of indigenous populations. In developed countries there is a need to recognize and maintain cultural values as part of cultural identity, for economic values of wood and non wood products, for the quality of life of people and biodiversity connected to traditional forest landscapes. The session will consider the major political initiatives related to the incorporation of cultural values in sustainable forest management, as well as issues and challenges associated with transferring cultural values in different parts of the world into forest management, including those related to criteria and indicators for sustainable forest management and certification standards. The session will include individual presentations in a moderated panel discussion.

H-13 An honest conversation about decentralization and forest livelihoods in a globalized world

Session coordinator: S. Denise Allen

The objective of this session is foster critical dialogue on the role of decentralization in forest-based communities in a global context. It will showcase the current scientific research of Ph.D. candidates, young scientists and faculty related to community management of forests, traditional knowledge systems, the impact of global economic development on local and indigenous communities, and the role of decentralization in poverty reduction and the maintenance of livelihoods in forested regions around the world. The session will include case study presentations during which emerging issues and common themes will be highlighted, followed by an extended open discussion session on the concept and potential of local traditions, customs, beliefs and expectations as locally contextualized resources in a globalized world. An associated poster session is also planned. The organizers invite scholars and practitioners with relevant international expertise to contribute to this session and participate in an honest debate on the limits of applied science.

H-14 Forest ethics and conflict

Session coordinator: Christian Gamborg

Forests and forestry have generated increasing public attention – and scrutiny. Behind sustainability-related technical questions lie ethical choices based on our fundamental values, for example about how to prioritise conservation of species and habitats, or whether or not to accept wood based biofuel production. Unfortunately there is a tendency to take these choices for granted, leaving the ethical issues – which may potentially turn into societal conflicts – unexplored. A key question is how such ethical issues should be addressed? The aim of this session is to gain a better understanding of, and suggest ways to handle, conflict situations arising in forest and nature management. Papers presented in this session will: examine varying views and norms among stakeholders, preferably through a focus on case studies; discuss and critically reflect on concerns and values related to forest and nature management through case studies or examination of key concepts (such as biodiversity); and/or discuss the scope, role and content of forest and nature ethics.

H-15 Sustainable forest management (SFM) through innovative forest laws and environmental legislation

Session coordinator: Peter Herbst

Can sustainability in forest management be achieved in the absence of a sound, applicable and enforceable legal basis? The IUFRO research group on forest law and environmental legislation's ongoing project on "Legal Aspects of European Forest Sustainable Development " has led to the collection and analysis of a vast number of case studies (from more than 40 countries, over more than 10 years). While much has been learned through this work, there is still a need to better share the European experiences with colleagues from around the world, and to extend these efforts to contributors from outside Europe. The focus of the session will be to discuss the positive and negative effects of specific forest and other environmental legislation on sustainable forest management practices and thus on the state of forests, with special emphasis on issues such as different ownership categories and (non-)governmental enforcement strategies and institutions

I. Forests, Human Health and Environmental Security

As environmental conditions in and around forests deteriorate in many regions - whether from warfare, population growth, uncontrolled logging, landscape modifications and land-use changes, climate change or any of a number of other causes, human health often also deteriorates. Such changes are likely to affect the vulnerable groups such as women, children, and marginalized ethnic groups most severely. Contributions to this theme will examine the interrelationships between forests and human health, the impacts of environmental changes on the well-being of different social groups in and around forests, and opportunities for enhancing the role of forests to promote community health, security and well-being.

I-01 Healthy urban forests: healthy people

Session coordinator: William Manning

The objectives of this session are: (a) to bring together researchers in urban forest health and function and researchers in the human health community; (b) to explore relationships between healthy urban forests and the health and well-being of people in urban areas, and (c) to identify common research goals for urban forest and human health researchers

I-02 Health benefits of forests

Session coordinators: Eeva Karjalainen, Shin Won Sop & Kjell Nilsson

Health benefits of forests include among other things positive influences of forests visits on mental and physical health, and health-promoting compounds derived from forests. Many studies report that natural environments reduce stress, improve human mood states, concentration and performance, and produce positive changes in human physiology. Forests also provide rich reserve of plant and microbial material that include compounds that can be utilized in pharmaceuticals and nutraceuticals. These bioactive compounds possess biological activities such as anticancer activity, antiatherogenic and antioxidant potential. This session aims at raising awareness of the health benefits of forests by presenting latest scientific research results on the topic as well as examples on how forests are used for human health in practice. In addition, critical overviews of the previous studies are welcomed.

I-03 Health risks of forests

Session coordinators: Matti Rousi & Heikki Henttonen

Emerging infectious diseases are among major challenges to science, global health and human development, especially so in tropical countries where many serious zoonotic diseases are found. Many factors are involved in the epidemiology of tropical diseases, including poverty, human population density, human migration, deforestation and climatic changes. Rodent borne and tick borne viruses are an example of situation in temperate zone, e.g. in Europe some 35000 cases of HFRS have been documented. An increase in incidence is related to climate change, to increase in the age and volume of temperate forests and to changes at landscape level, and also to several socio-economical changes. The session aims at raising awareness of the health hazards related to forests by presenting latest scientific research results on the topic as well as examples how deforestation and forest fragmentation affect to health of people inhabiting rural areas in developing countries. This session aims to take an interdisciplinary approach, discussions of complex socio-economical changes, and ways of integrating research and practice will be encouraged.

I-04 Knowledge systems, societal participation and sustainable forestry for human wellbeing

Session coordinators: P.S. Ramakrishnan & John Parrotta

There is an increasing realization of the need to involve forest dwellers as one of the key stakeholders in sustainable forest management, particularly in consideration of their biodiversity conservation-centred livelihood concerns. Traditional forest knowledge, appropriately linked with formal knowledge to arrive at 'hybrid technologies' for sustainable forest management, is not only relevant in the context of SFM, but is increasingly recognized for its potential to reduce or avert human conflicts and thereby contribute towards global human security. This session will explore: (i) current status of, and perspectives on, traditional forest knowledge, considering both developing and developed world perspectives; (ii) the relationships between intangible values vs. tangible benefits that forest-dependent communities seek from forested landscapes; (iii) approaches for linking knowledge systems (traditional and formal) to develop hybrid technologies to conserve biodiversity and the linked cultural diversity of forest dwellers; (iv) sustainable agriculture and food security of marginalized societies living in the forested landscape; (v) contribute towards human security at the local, regional and global levels.

I-05 Non-timber forest resources and human welfare

Session coordinators: Carsten Smith Olsen, Jim Chamberlain & Susan Alexander

This session will examine the role of non-timber forest resources in maintaining and improving human welfare in developing countries. Presentations will focus on how and to what degree non-timber forest resources contribute to urban or rural livelihoods, including their contribution to current consumption, safety net functions and pathways out of poverty. Specific topics may include, for example, the role of forest gathered edible forest products to supplement food security and diversification of diets; the importance of medicinal plants for maintaining and improving health; or the potential of non-timber forest product based small-scale enterprises to contribute to poverty alleviation. All presentations should clearly contribute to our improved understanding of the linkages between non-timber forest produce and livelihoods. The session will be formatted to allow for a diversity of presentations. Papers and panel discussions will form the basis of the session and we will invite posters as well. A proceeding of selected papers is also planned.

I-06 Healthy forests, healthy people – gender perspectives on climate change

Session coordinator: Gun Lidestav

Climate change is a growing societal concern, reflected in international negotiations, national policies, market adaptations, and in the everyday life of women and men. In this session the implications of gender differences in access to information and decision-making processes related to climate change in forestry, will be examined and analyzed, in order to identify ways to resolve gender discrepancies. Presentations will address the following questions: How do perception and knowledge of climate change vary by gender in general, and how is it reflected in the health and well-being of women and men living in forestry communities in particular? Does accessibility to decision-making processes related to climate change, including private consumption decisions, differ between women and men? What considerations might women working in forestry and/or living in forestry communities add to discussions and decision-making processes about climate change impacts and adaptations in their communities? How do they advance these concerns in forest governance systems? What are the implications (and recommendations) for health, social, and forestry policy and programs?