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## I. IN THE PRESS

11 October 2014 - IUFRO

### [The Salt Lake City Declaration](#)

The 24th World Congress of the International Union of Forest Research Organizations (IUFRO) "Sustaining Forests, Sustaining People: The Role of Research" brought together 2,500 scientists from more than 100 countries, and 1,200 professional foresters from North America. It provided a unique forum for presentation and discussion of current and future global research needs in forest science. The Congress explored the role of science in crafting practical measures to enhance the resilience of forests and their capacity to provide the environmental, economic, social, cultural, spiritual and health benefits that sustain rural and urban societies worldwide.

7 October 2014 - United Nations

### [Benefits of investing in protection of biodiversity outweigh financial costs, says UN-backed report](#)

Implementing measures that promote the sustainable use of biodiversity is a worthwhile investment that will bring multiple economic and environmental benefits to countries, according to a United Nations-backed report released today. The report, released at the 12th meeting of the Conference of the Parties to the Convention on Biological Diversity (CBD), known as COP-12, in Pyeongchang, Republic of Korea, found that there is a gap across all countries and regions between investments needed to meet the 20 global biodiversity goals known as the Aichi targets, and the resources currently allocated to this endeavour.

6 October 2014 - The Nation

### [Changing climate demands a change in thinking](#)

Many countries in the Asia and the Pacific region are experiencing frequent and intense flooding, droughts and storms. Regional climate change trends include an average temperature increase of 0.76 degrees C and a 1-3 mm rise in sea levels annually. To address this, international experts held a discussion on how local communities are adapting to climate change through community forestry

1 October 2014 - IISD

### [September 2014 Climate Finance Update](#)

In September 2014, the African Development Bank (AfDB), the European Investment Bank (EIB), the

Inter-American Development Bank (IDB), Climate Investment Funds (CIF), the Global Environment Facility (GEF), the International Fund for Agricultural Development (IFAD) and the World Bank reported on various climate finance developments, including in the areas of green bonds, transport, forest emissions and climate resilience.

October 2014 - UN-REDD Programme

### [UN-REDD Newsletter October](#)

Read the new October issue of the UN-REDD newsletter.

October 2014 - IISD

### [IUFRO Identifies Conditions for Successful SFM](#)

The International Union of Forest Research Organizations (IUFRO) has released a comprehensive analysis, titled 'Forests Under Pressure: Local responses to global issues.' The analysis reviews 27 case studies in order to identify opportunities for and challenges facing sustainable forest management (SFM).

23 September 2014 - United Nations

### [Climate Summit Launches Efforts Toward Food Security for 9 Billion People by 2050. Climate-Smart Agriculture Builds Resilience for Farmers and Reduces Emissions](#)

Global efforts to protect 500 million farmers from climate change while increasing agricultural productivity and reducing carbon emissions were strengthened at today's Climate Summit, with commitments pledged by dozens of countries, companies and organizations. More than 20 Governments, 30 organizations and companies announced they would join the newly launched Global Alliance for Climate-Smart Agriculture. The countries joining represent millions of farmers, at least a quarter of the world cereal production, 43 million undernourished people and 16 per cent of total agricultural greenhouse gas emissions.

22 September 2014 - IISD

### [USAID Research Explores Link between Devolving Rights to Local Levels and Forest Outcomes](#)

A study produced for the USAID Tenure and Global Climate Change (TGCC) project examines the conditions under which devolution of forest management rights to local communities may result in improved forest conditions, finding limited causal evidence that devolving rights to local communities alone results in improved outcomes

## II. MULTILATERAL PROCESSES IN CLIMATE CHANGE

### Upcoming events

#### **Bonn Climate Change Conference, 20-25 October 2014, Bonn, Germany**

The Ad Hoc Working Group on the Durban Platform for Enhanced Action (ADP) will hold the sixth part of its second session from 20-25 October 2014 in Bonn, Germany. Further information on the session will be made available in due course. [More](#)

## III. EVENTS & MEETINGS

#### **2nd International Conference on Evaluating Climate Change and Development**

*4-6 November, 2014, Washington D.C., United States of America*

Scheduled for November 4-6, 2014 in Washington D.C., this 2nd International Conference will tackle the difficulties linked to the evaluation of climate change and development, described by many as a major 21st century evaluation challenge. Participants for the conference are expected to be drawn equally from the global South and North to take stock of existing tools and methods but also reflect on and share experiences on emerging approaches in order to improve the practice of climate change evaluation. Efforts will also be made towards identify new and innovative ways to create an enabling environment for the demand and use of climate change and development evaluation in order to improve policy making. [More](#)

#### **2014 Global Landscapes Forum**

*6-7 December, 2014, Lima Peru*

The second Global Landscapes Forum will be held in Lima on the weekend in the middle of the 20th Conference of the Parties (COP20) to the UNFCCC. With this timing and location, this major event can draw on the presence in the city of world leaders, development experts and leading thinkers to create an influential space to position landscapes at the center of the emerging climate and development agreements. Countries are forging a successor to the Kyoto Protocol under the United Nations Framework Convention on Climate Change (UNFCCC) and, in parallel, designing a set of Sustainable Development Goals to replace the Millennium Development Goals. Connecting these two processes and multifunctional landscapes is vital if we are to overcome the complex challenges common to everyone on the planet. The two-day event will take place at the Westin Lima Hotel and Convention Center, a 20-minute drive from the COP20 venue and in the only venue in Lima outside the COP with the capacity to support an event of this size and diversity. [More](#)

#### **Economics of Climate Change Mitigation Options in the Forestry Sector**

*6-27 February 2015, online conference*

Forestry policy makers, forest economists, scientists and researchers from all over the world can now register for a unique FAO-run online conference entitled Economics of Climate Change Mitigation Options in the Forestry Sector. A hundred free places are available for each session of the conference, which will take place during 6 -27 February 2015. The conference will focus on the costs and benefits of ways in which the forestry sector can mitigate climate change, and examine how different countries and regions mitigate climate change through forest management interventions and improved use of wood. Discussions will also showcase lessons learned from mitigation efforts and their impacts on the value chain of forest products. Visit the Conference web page to register, or submit a case study abstract. [More](#)

## IV. RESEARCH ARTICLES

### **Biodiversity and ecosystem services: lessons from nature to improve management of planted forests for REDD-plus**

Thompson, Ian D.; Okabe, Kimiko; Parrotta, John A.; Brockerhoff, Eckehard; Jactel, Hervcb; Forrester, David I.; Taki, Hisatomo;

*Biodiversity and conservation*. 2014 Sept. 23(10) p. 2613-2635

Planted forests are increasingly contributing wood products and other ecosystem services at a global scale. These forests will be even more important as carbon markets develop and REDD-plus forest programs (forests used specifically to reduce atmospheric emissions of CO through deforestation and forest degradation) become common. Restoring degraded and deforested areas with long-rotation planted forests can be accomplished in a manner that enhances carbon storage and other key ecosystem services. Knowledge from natural systems and understanding the functioning novel of ecosystems can be instructive for planning and restoring future forests. Here we summarize information pertaining to the mechanisms by which biodiversity functions to provide ecosystem services including: production, pest control, pollination, resilience, nutrient cycling, seed dispersal, and water quality and quantity and suggest options to improve planted forest management, especially for REDD-plus.

### **Contrasting effects of climate change along life stages of a dominant tree species: the importance of soilclimate interactions**

IbcLclez, Beatriz; IbcLclez, Incbs; GcdmezAparicio, Lorena; RuizBenito, Paloma; Garcca, Luis V.; Maraclcdn, Teodoro; Thuiller, Wilfried

*Diversity & distributions*. 2014 Aug. 20(8) p. 872-883.

AIM: For tree species, adult survival and seedling and sapling recruitment dynamics are the main processes that determine forest structure and composition. Thus, studying how these two life stages may be affected by climate change in the context of other abiotic and biotic variables is critical to understand future population trends. The aim of this study was to assess the sustainability of cork oak (*Quercus suber*) forests at the core of its distributional range under future climatic conditions. LOCATION: Southern Spain. METHODS: Using forest inventory data collected at two periods 10iu years apart, we performed a comprehensive analysis to evaluate the role of different abiotic and biotic factors on adult survival and recruitment patterns. RESULTS: We found that both life stages were influenced by climatic conditions, but in different ways. Adult tree survival was negatively impacted by warmer spring temperatures, while recruitment was positively affected by warmer winter temperatures. Our results also revealed the importance of soil texture as a modulator of winter precipitation effects on adult survival. With higher winter precipitation, adult survival increased in sandy soils and decreased in clayish soils. Therefore, under predicted future climate scenarios of wetter winters and warmer temperatures, the presence of cork oaks is more likely to occur in sandy soils vs. clayish soils. Biotic conditions also affected these life stages. We found a negative effect of heterospecific but not conspecific trees on both adult survival and seedling recruitment. MAIN CONCLUSIONS: Overall, the sustainability of the studied forests will be highly dependent not only on future climatic trends, but also on their interaction with other key factors soil properties in particular that modulate the effects of climate on demographic rates.

### **Forest fragments modulate the provision of multiple ecosystem services**

Mitchell, Matthew G. E.; Bennett, Elena M.; Gonzalez, Andrew; BanksLeite, Cristina

*Journal of applied ecology*. 2014 Aug. 51(4) p. 909-918.

Agricultural landscapes provide the essential ecosystem service of food to growing human populations; at the same time, agricultural expansion to increase crop production results in forest fragmentation, degrading many other forestdependent ecosystem services. However, surprisingly little is known about the role that forest fragments play in the provision of ecosystem services and how fragmentation affects landscape multifunctionality at scales relevant to land management decisions. We measured the provision of six ecosystem services (crop production, pest regulation, decomposition, carbon storage, soil fertility and water quality regulation) in soya bean fields at different distances from adjacent forest fragments that differed in isolation and size across an agricultural landscape in Quebec, Canada. We observed significant effects of distancefromforest, fragment isolation and fragment size on crop production, insect pest regulation, and

decomposition. Distance from forest and fragment isolation had unique influences on service provision for each of the ecosystem services we measured. For example, pest regulation was maximized adjacent to forest fragments, while crop production was maximized at intermediate distances from forest. As a consequence, landscape multifunctionality depended on landscape heterogeneity: the range of field and forest fragment types present. We also observed strong negative and positive relationships between ecosystem services that were more prevalent at greater distances from forest. Synthesis and applications. Our study is one of the first to empirically measure and model the effects of forest fragments on the simultaneous provision of multiple ecosystem services in an agroecosystem at the landscape and field scales relevant to landowners and managers. Our results demonstrate that forest fragments, irrespective of their size, can affect the provision of multiple ecosystem services in surrounding fields, but that this effect is mediated by fragment isolation across the landscape. Our results also suggest that managing habitat fragmentation and landscape structure will improve our ability to optimize ecosystem service provision and create multifunctional agricultural landscapes

### **Integrating stakeholders demands and scientific knowledge on ecosystem services in landscape planning**

Palacios-Agundez, Igone; FerncLndez de Manuel, Beatriz; Rodrcguez-Loinaz, Gloria; Pecla, Lorena; Ametzaga-Arregi, Ibone; Alday, Josu G.; Casado-Arzuaga, Izaskun; Madariaga, Iosu; Arana, Xabier; Onaindia, Miren

*Landscape ecology*. 2014 Oct. 29(8) p. 1423-1433

The conflict between conservation and timber production is shifting in regions such as Biscay (Basque Country, northern Spain) where planted forests are no longer profitable without public subsidies and environmentalist claim that public subsidies should be reoriented to the regeneration of natural forest. This paper develops an approach that integrates scientific knowledge and stakeholders demands to provide decision-making guidelines for the development of new landscape planning strategies while considering ecosystem services. First, a participatory process was conducted to develop a community vision for the regions sustainable future considering the opportunities and constrains provided by the landscape and its ecosystems. In the participatory process forest management was considered an important driver for the region`s landscape development and forest multi-functionality was envisioned as a feasible attractive alternative. The participatory process identified a knowledge gap on the synergies and trade-offs between biodiversity and carbon storage and how these depend on different forest types. Second, to study the existing synergies and trade-offs between biodiversity and carbon storage and disentangle the identified knowledge gap, a GIS-based research was conducted based on spatially explicit indicators. Our spatial analysis results showed that natural forests contribution to biodiversity and carbon storage is higher than that of the plantations with exotic species in the region. The results from the spatial analysis converged with those from the participatory process in the suitability of promoting, where possible and appropriate, natural forest ecosystems restoration. This iterative learning and decision making process is already showing its effectiveness for decision making, with concrete examples of how the results obtained with the applied approach are being included in planning and decision-making processes.

### **A tree-ring perspective on the terrestrial carbon cycle**

Babst, Flurin; Alexander, M. Ross; Szejner, Paul; Bouriaud, Olivier; Klesse, Stefan; Roden, John; Ciais, Philippe; Poulter, Benjamin; Frank, David; Moore, David J. P.; Trouet, Valerie

*Oecologia*. 2014 Oct. 176(2) p. 307-322

Tree-ring records can provide valuable information to advance our understanding of contemporary terrestrial carbon cycling and to reconstruct key metrics in the decades preceding monitoring data. The growing use of tree rings in carbon-cycle research is being facilitated by increasing recognition of reciprocal benefits among research communities. Yet, basic questions persist regarding what tree rings represent at the ecosystem level, how to optimally integrate them with other data streams, and what related challenges need to be overcome. It is also apparent that considerable unexplored potential exists for tree rings to refine assessments of terrestrial carbon cycling across a range of temporal and spatial domains. Here, we summarize recent advances and highlight promising paths of investigation with respect to (1) growth phenology, (2) forest productivity trends and variability, (3) CO<sub>2</sub> fertilization and water-use efficiency, (4) forest disturbances, and (5) comparisons between observational and computational forest productivity estimates. We encourage the integration of tree-ring data: with eddy-covariance measurements to investigate carbon allocation patterns and water-use efficiency; with remotely sensed observations to distinguish the timing of cambial growth and leaf phenology; and with forest inventories to develop continuous, annually-resolved and long-term carbon budgets. In addition, we note the potential of tree-ring records and derivatives thereof to help evaluate the performance of earth system models regarding the simulated magnitude and dynamics of forest carbon uptake, and inform these models about growth responses to (non-)climatic drivers. Such efforts are expected to improve our understanding of forest carbon cycling and place current developments into a long-term perspective.

## **Impacts of acid deposition, ozone exposure and weather conditions on forest ecosystems in Europe: an overview**

de Vries, W.; Dobbertin, M. H.; Solberg, S.; van Dobben, H. F.; Schaub, M.

*Plant and soil*. 2014 July. 380(1-2) p. 1-45

**BACKGROUND:** In 1994, a Pan-European Programme for Intensive and Continuous Monitoring of Forest Ecosystems started to contribute to a better understanding of the impact of air pollution, climate change and natural stress factors on forest ecosystems. The programme today counts approximately 760 permanent observation plots including near 500 plots with data on both air quality and forest ecosystem impacts. **SCOPE:** This paper first presents impacts of air pollution and climate on forests ecosystems as reported in the literature on the basis of laboratory and field research. Next, results from monitoring studies, both at a European wide scale and related national studies, are presented in terms of trends and geographic variations in nitrogen and sulphur deposition and ozone concentrations and the impacts of those changes in interaction with weather conditions on (i) water and element budgets and nutrient-acidity status, (ii) forest crown condition, (iii) forest growth and carbon sequestration and (iv) species diversity of the ground vegetation. The empirical, field based forest responses to the various drivers are evaluated in view of available knowledge. **CONCLUSIONS:** Analyses of large scale monitoring data sets show significant effects of atmospheric deposition on nutrient-acidity status in terms of elevated nitrogen and sulphur or sulphate concentrations in forest foliage and soil solution and related soil acidification in terms of elevated aluminium and/or base cation leaching from the forest ecosystem. Relationships of air pollution with crown condition, however, appear to be weak and limited in time and space, while climatic factors appear to be more important drivers. Regarding forest growth, monitoring results indicate a clear fertilization effect of N deposition on European forests but the field evidence for impacts of ambient ozone exposure on tree growth is less clear.

## **Estimating the opportunity costs of reducing carbon dioxide emissions via avoided deforestation, using integrated assessment modelling**

Overmars, K. P.; Stehfest, E.; Tabeau, A.; Meijl, H. van; Beltran, A. M.; Kram, T

*Land Use Policy*; 2014. 41:45-60.

Estimates show that, in recent years, deforestation and forest degradation accounted for about 17% of global greenhouse gas emissions. The implementation of REDD (Reducing Emissions from Deforestation and Forest Degradation in Developing Countries) is suggested to provide substantial emission reductions at low costs, although cost estimates show large uncertainty. Cost estimates can differ, as they depend on the approach chosen, for example: giving an economic stimulus to entire countries, taking landowners as actors in a REDD framework, or starting from protecting carbon-rich areas. This last approach was chosen for this analysis. Proper calculation of the economic cost requires an integrated modelling approach involving biophysical impact calculations and their associated economic effects. To date, only a few global modelling studies have applied such an approach. In modelling REDD measures, the actual implementation of REDD can take many forms, with implications for the results. This study assumes that non-Annex I countries will protect carbon-rich areas against deforestation, and therefore will refrain from using these areas as agricultural land. The opportunity costs of reducing deforestation within the framework of REDD were assessed using an integrated economic and land-use modelling approach comprising the global economic LEITAP model and the biophysical IMAGE model. One of the main methodological challenges is the representation of land use and the possibility to convert woodlands land into agricultural land. We endogenised the availability of agricultural land by introducing a flexible land supply curve, and represented the implementation of REDD policies as a reduction in the maximum amount of unmanaged land that potentially would be available for conversion to agriculture, in various regions in the world. In a series of model experiments, carbon-rich areas in non-Annex I countries were protected from deforestation. In each consecutive scenario the protected area was increased, starting off with the most carbon rich lands, worldwide systematically working down to areas with less carbon storage. The associated opportunity costs, expressed in terms of GDP reduction, were calculated with the economic LEITAP model. The resulting net reduction in carbon dioxide emissions from land-use change was calculated with the IMAGE model. From the sequence of experiments, marginal cost curves were constructed, relating carbon dioxide emission reductions to the opportunity costs. The results showed that globally a maximum of around 2.5 Gt carbon dioxide emissions could be avoided, annually. However, regional differences in opportunity costs are large and were found to range from about 0 to 3.2 USD per tonne carbon dioxide in Africa, 2 to 9 USD in South America and Central America, and 20 to 60 USD in Southeast Asia. These results are comparable to other studies that have calculated these costs, in terms of both opportunity costs and the regional distribution of emissions reduction.

## **Exploitation of carbon energy and the integrity of protected rainforest areas in Nigeria**

Ewah, J. O

*International Journal of Humanities and Social Science*; 2014. 4(6(1)):206-215.

Exploitation of fuel wood in pre-colonial Africa did not affect ecological balance. Carbon generated was sunk

into living trees in exchange for oxygen. However, the coming of colonialism, industrial revolution, introduction of scientific or industrial forestry and urbanization has substantially altered the balance between exploitation and forest sustainability. The impact of fuel wood exploitation on protected areas in Nigeria and beyond on the environment is degrading. The study identified climate change and global warming as products of deforestation enhanced through charcoal and fuel wood exploitation. The study traced the origin of fuel wood and charcoal business in Nigeria and suggested alternatives to fuel wood that will enhance the sustainability of the remaining rainforest areas in Nigeria and beyond. This study examined the form and content of fuel wood or biomass exploitation in different ecological zones in Nigeria and its impact on the integrity of the rainforest and savannah region in Nigeria. It also referred to environmental challenges such as climate change desertification global warming and floods as some of the major effects and contributions of fuel wood and charcoal to environmental degradation. The study emphasized the role of households and commercial exploitation in environmental abuse and suggests alternative methods such as renewable energy and stoves to check the negative effects of climate change, desertification and global warming in Nigeria and beyond.

### **Eye on the Taiga: removing global policy impediments to safeguard the boreal forest**

Moen, J.; Rist, L.; Bishop, K.; Chapin, F. S., III; Ellison, D.; Kuuluvainen, T.; Petersson, H.; Puettmann, K. J.; Rayner, J.; Warkentin, I. G.; Bradshaw, C. J. A

*Conservation Letters*; 2014. 7(4):408-418.

The absence of boreal forests from global policy agendas on sustainable development and climate change mitigation represents a massive missed opportunity for environmental protection. The boreal zone contains some of the world's largest pools of terrestrial carbon that, if not safeguarded from a conversion to a net source of greenhouse gases, could seriously exacerbate global climate change. At the same time, boreal countries have a strong tradition of forest management - expertise that could be effectively leveraged toward global and national carbon mitigation targets and sustainable development. Current obstacles against such contributions include weak incentives for carbon sequestration and a reluctance to embrace change by forest managers and policy makers. We discuss possible solutions to overcome these obstacles, including the improvement of ineffective incentives, the development of alternative forest management strategies, and the need to maintain ecosystem resilience through the pursuit of policy and management options.

### **An isoline separating relatively warm from relatively cool wintertime forest surface temperatures for the southeastern United States**

Wickham, J.; Wade, T. G.; Riitters, K. H

*Global and Planetary Change*; 2014. 120:46-53

Forest-oriented climate mitigation policies promote forestation as a means to increase uptake of atmospheric carbon to counteract global warming. Some have pointed out that a carbon-centric forest policy may be overstated because it discounts biophysical aspects of the influence of forests on climate. In extra-tropical regions, many climate models have shown that forests tend to be warmer than grasslands and croplands because forest albedos tend to be lower than non-forest albedos. A lower forest albedo results in higher absorption of solar radiation and increased sensible warming that is not offset by the cooling effects of carbon uptake in extra-tropical regions. However, comparison of forest warming potential in the context of climate models is based on a coarse classification system of tropical, temperate, and boreal. There is considerable variation in climate within the broad latitudinal zonation of tropical, temperate, and boreal, and the relationship between biophysical (albedo) and biogeochemical (carbon uptake) mechanisms may not be constant within these broad zones. We compared wintertime forest and non-forest surface temperatures for the southeastern United States and found that forest surface temperatures shifted from being warmer than non-forest surface temperatures north of approximately 36 degrees N to cooler south of 36 degrees N. Our results suggest that the biophysical aspects of forests' influence on climate reinforce the biogeochemical aspects of forests' influence on climate south of 36 degrees N. South of 36 degrees N, both biophysical and biogeochemical properties of forests appear to support forestation as a climate mitigation policy. We also provide some quantitative evidence that evergreen forests tend to have cooler wintertime surface temperatures than deciduous forests that may be attributable to greater evapotranspiration rates.

### **Analysis of biophysical and anthropogenic variables and their relation to the regional spatial variation of aboveground biomass illustrated for North and East Kalimantan, Borneo**

Laan, C. van der; Verweij, P. A.; Quinones, M. J.; Faaij, A. P. C

*Carbon Balance and Management*; 2014. 9(8):(19 September 2014)

Background: Land use and land cover change occurring in tropical forest landscapes contributes substantially to carbon emissions. Better insights into the spatial variation of aboveground biomass is therefore needed. By means of multiple statistical tests, including geographically weighted regression, we analysed the effects of

eight variables on the regional spatial variation of aboveground biomass. North and East Kalimantan were selected as the case study region; the third largest carbon emitting Indonesian provinces. Results: Strong positive relationships were found between aboveground biomass and the tested variables; altitude, slope, land allocation zoning, soil type, and distance to the nearest fire, road, river and city. Furthermore, the results suggest that the regional spatial variation of aboveground biomass can be largely attributed to altitude, distance to nearest fire and land allocation zoning. Conclusions: Our study showed that in this landscape, aboveground biomass could not be explained by one single variable; the variables were interrelated, with altitude as the dominant variable. Spatial analyses should therefore integrate a variety of biophysical and anthropogenic variables to provide a better understanding of spatial variation in aboveground biomass. Efforts to minimise carbon emissions should incorporate the identified factors, by (1) the maintenance of lands with high AGB or carbon stocks, namely in the identified zones at the higher altitudes; and (2) regeneration or sustainable utilisation of lands with low AGB or carbon stocks, dependent on the regeneration capacity of the vegetation. Low aboveground biomass densities can be found in the lowlands in burned areas, and in non-forest zones and production forests.

### **Contemporary land use/land cover types determine soil organic carbon stocks in south-west Rwanda**

Wasige, J. E.; Groen, T. A.; Rwamukwaya, B. M.; Tumwesigye, W.; Smaling, E. M. A.; Jetten, V. *Nutrient Cycling in Agroecosystems*; 2014. 100(1):19-33

Soil organic carbon (SOC) constitutes a large pool within the global carbon cycle. Land use change significantly drives SOC stock variation. In tropical central and eastern Africa, how changes in land use and land cover impact on soil C stocks remains unclear. Variability in the existing data is typically explained by soil and climate factors with little consideration given to land use and management history. To address this knowledge gap, we classified the current and historical land cover and measured SOC stocks under different land cover, soil group and slope type in the humid zone of south-west Rwanda. It was observed that SOC levels were best explained by contemporary land cover types, and not by soil group, conversion history or slope position, although the latter factors explained partly the variation within annual crop land cover type. Lack of the influence of land use history on SOC stocks suggests that after conversion to a new land use/land cover, SOC stocks reached a new equilibrium within the timestep that was observed (25 years). For conversion to annual crops, SOC stocks reach a new equilibrium at about 2.5% SOC concentration which is below the proposed soil fertility threshold of 3% SOC content in the Eastern and central African region. SOC stock declined under transitions from banana-coffee to annual crop by 5% or under transitions from natural forest to degraded forest by 21% and increased for transitions from annual crops to plantation forest by 193%. Forest clearing for agricultural use resulted in a loss of 72%. Assuming steady states, the data can also be used to make inferences about SOC changes as a result of land cover changes. We recommend that SOC stocks should be reported by land cover type rather than by soil groups which masks local land cover and landscape differences. This study addresses a critical issue on sustainable management of SOC in the tropics and global carbon cycle given that it is performed in a part of the world that has high land cover dynamics while at the same time lacks data on land cover changes and SOC dynamics.

### **Forest cover change and its drivers in the upstream area of the Minjiang River, China**

Hu XiSheng; Wu ChengZhen; Hong Wei; Qiu RongZu; Li Jian; Hong Tao *Ecological Indicators*; 2014. 46:121-128

Rapid human-driven conversion of global forest cover is contributing to the loss of habitat, biodiversity, and climate change. Even in a relatively short time interval and a small local region with relatively homogeneous biophysical interference, forest cover may be changed considerably by human disturbances. To better understand human influences on the pattern of forest cover change (FCC), we investigated the factors of FCC from 2007 to 2012 by combining the broad socio-economic information at the census block group level with the site-specific information measured at the pixel level. Taking the upstream area of the Minjiang River, China, as a case study, the result indicated that the major forest cover classes had a high rate of persistence in area size during the study period, while conversions among forest covers and into non-forest land occurred frequently, accounting for 5.4% of the landscape. The change of mixed forest was among the greatest one, decreasing sharply from 24.0% to 21.6% of the entire landscape, which converted predominantly into coniferous forest from 2007 to 2012. Additionally, 90.0% of the net gain to non-forest land was largely supplied by coniferous forest and mixed forest. The findings corroborate that human-driven conversions of forest covers have deleterious effects on biodiversity conservation in the upstream area of the Minjiang River. Furthermore, a binary logistic regression model was used to observe the biophysical/socio-economic drivers of FCC. We identified a FCC pattern during the period of study that was associated with collective- or enterprise-owned forests, low level of protection intensity forests, and the regions with high growth rates of fiscal revenue and far away from the city center. These results confirm that as a whole the relevant governments play an important role in the FCC in the region. This study is important for the relevant policy-makers and planners to

better understand the underlying patterns and causes of this landscape change, to develop effective strategies for conserving biodiversity.

## **Uncertainty in initial forest structure and composition when predicting carbon dynamics in a temperate forest**

Antonarakis, A. S

*Ecological Modelling*; 2014. 291:134-141

The initial or current ecosystem state is a necessary factor in forecasting how terrestrial ecosystems will respond to changes in climate, CO<sup>2</sup>, and other environmental forcings over the upcoming decades. Terrestrial biosphere models are important forecasting tools, but to improve our understanding of large-scale terrestrial ecosystem function, we need to consider data from a number of sources and scales. Today remote sensing is improving our ability to derive information on forest structure and composition at a variety of scales, but their uncertainties in deriving these products to predicted carbon fluxes have not been investigated. This study investigated how uncertainties in forest structure and composition initialized at a temperate North American forest using a state-of-the-art terrestrial biosphere model affect predictions of carbon dynamics in the short and decadal time-frame. Uncertainties in net carbon predictions are compared to a +or-20% uncertainty value estimated for the terrestrial sink component of the global carbon budget (Pan et al., 2011). For short-term simulations, a +or-20% uncertainty in both forest structure and composition is enough to predict a net carbon flux variation of +or-21.5% (+or-0.077 kg C/m<sup>2</sup>/year) and +or-20.5% (+or-0.092 kg C/m<sup>2</sup>/year) respectively. For medium-term (11-40 years) simulations, only a 50% uncertainty in the initial forest structure predicts a net carbon flux variation beyond the +or-20% threshold, but uncertainties in net carbon flux variation beyond +or-20% were predicted from a 5% change in initial composition after 25 years of simulation. Remote sensing-derived forest structure and composition using LiDAR and imaging spectroscopy were also initialized, with all short term simulated net carbon fluxes within the +or-20% cutoff. These results indicate that an accurate and full description of forest structure and composition from remote sensing within a +or-20% uncertainty can be adequate in producing improved forecasts of terrestrial ecosystems for the next few decades.

## **Biomass carbon stock in relation to different land uses in a semiarid environment**

Duran Zuazo, V. H.; Francia Martinez, J. R.; Rodriguez Pleguezuelo, C. R.; Cuadros Tavira, S

*Journal of Land Use Science*; 2014. 9(4):474-486

Data on the aboveground and root-biomass carbon (C) were recorded for different land-use types on hillslopes within Mediterranean agroforestry watershed. Eight land-use types were selected: farmland with olive, almond, and cereals; forest with *Pinus halepensis* and *Pinus sylvestris* stands; shrubland; grassland; and abandoned farmland. Shrubland and forest exhibited the highest C stocks in biomass in relation to the land-use types investigated. Our results showed that abandoned farmland had significantly lower C stocks than did farmland, grassland, or shrubland, although with progressive plant recolonization that offered greater potential capacity for C sequestering. The average C stocks in biomass for *P. halepensis*, *P. sylvestris*, shrubland, olive, almond, grassland, cereals, and abandoned farmland was 87.5, 29.7, 13.7, 7.1, 7.9, 5.4, 3.7, and 1.6 Mg ha<sup>-1</sup>, respectively. In general terms of land use, the biomass C stock showed the following descending order: forest > farmland > shrubland > grassland > abandoned land. Consequently, our approach enables a comparison of C-stock patterns related to the land-use types in the experimental area.

## **Life-cycle energy and emission analysis of power generation from forest biomass**

Amit Thakur; Canter, C. E.; Amit Kumar

*Applied Energy*; 2014. 128:246-253

Forest harvest residues, which include limbs, branches, and tree tops, have the potential to generate energy. This paper uses a life-cycle assessment to determine the energy input-to-output ratios for each unit operation in the use of these residues for power generation. Two preparation options for obtaining the biomass were evaluated. For Option 1, the forest residues were chipped at the landing, while for Option 2 they were bundled and chipped at the power plant. Energy use and greenhouse gas (GHG) emissions were found for power plants sizes ranging from 10 to 300 MW. For power plants with capacities greater than 30 MW, the transportation of either bundles or woodchips to the power plant used the most energy, especially at larger power plant sizes. Option 1 used less energy than Option 2 for all power plant sizes, with the difference between the two becoming smaller for larger power plants. For the life-cycle GHG emissions, Option 1 ranges from 14.71 to 19.51 g-CO<sub>2</sub>eq/kW h depending on the power plant size. Option 2 ranges from 21.42 to 20.90 g-CO<sub>2</sub>eq/kW h. The results are not linear and are close to equal at larger power plant sizes. The GHG emissions increase with increasing moisture content. For a 300 MW power plant with chipping at the landing, the GHG emissions range from 11.17 to 22.24 g-CO<sub>2</sub>eq/kW h for moisture contents from 15% to 50%. The sensitivity analysis showed both energy use and GHG emissions are most sensitive to moisture content and then plant lifetime. For the equipment, both the energy use and GHG emissions are most sensitive to changes in the fuel consumption and

load capacity of the chip van and the log-haul truck used to transport either bundles or wood chips to the lower plant.

### **The importance of climate variability changes for future levels of tree-based forest ecosystem services**

Rasche, L.

*International Journal of Biodiversity Science, Ecosystem Services and Management*; 2014. 10(3):187-197

The climate is changing, yet to which degree and in what pattern remains uncertain in many areas. In forest science, mainly impacts of long-term mean changes in temperature and precipitation distributions are studied. This paper therefore presents a sensitivity analysis to determine the importance of accounting for variability changes. A 10\*10 matrix of different mean annual temperatures and precipitation sums is set up, covering the temperate forest zone of Europe, and the current level of several ecosystem services (ES) is calculated. Subsequently, mean and variability of temperature and precipitation distributions are changed in different steps, and new ES levels calculated. The results show that for the study of climate change impacts on forest ES, climate parameter variability is of secondary importance. The trends are well represented with scenarios of mean climate parameter changes only; however, on moisture-limited and heat-stressed sites impacts of changes in variability gain in importance. Most of these impacts are negative, and can be observed not only in monocultures already at their physiological limit, but also in diverse stands. Different ES, however, show different sensitivities towards changes in mean and variability, underlining the need to develop adaptation measures tailored to the sites and ES of interest.

### **Environmental determinants of tropical forest and savanna distribution: a quantitative model evaluation and its implication.**

Zeng ZhenZhong; Chen, A. P.; Piao ShiLong; Rabin, S.; Shen ZeHao;

*Journal of Geophysical Research: Biogeosciences*; 2014. 119(7):1432-1445

The distributions of tropical ecosystems are rapidly being altered by climate change and anthropogenic activities. One possible trend - the loss of tropical forests and replacement by savannas - could result in significant shifts in ecosystem services and biodiversity loss. However, the influence and the relative importance of environmental factors in regulating the distribution of tropical forest and savanna biomes are still poorly understood, which makes it difficult to predict future tropical forest and savanna distributions in the context of climate change. Here we use boosted regression trees to quantitatively evaluate the importance of environmental predictors - mainly climatic, edaphic, and fire factors - for the tropical forest-savanna distribution at a mesoscale across the tropics (between 15 degrees N and 35 degrees S). Our results demonstrate that climate alone can explain most of the distribution of tropical forest and savanna at the scale considered; dry season average precipitation is the single most important determinant across tropical Asia-Australia, Africa, and South America. Given the strong tendency of increased seasonality and decreased dry season precipitation predicted by global climate models, we estimate that about 28% of what is now tropical forest would likely be lost to savanna by the late 21st century under the future scenario considered. This study highlights the importance of climate seasonality and interannual variability in predicting the distribution of tropical forest and savanna, supporting the climate as the primary driver in the savanna biogeography.

### **Prediction of stem biomass of *Pinus caribaea* growing in the low country wet zone of Sri Lanka.**

Subasinghe, S. M. C. U. P.; Harpriya, A. M. R.;

*Journal of Tropical Forestry and Environment*; 2014. 4(1):40-49

Forests are important ecosystems as they reduce the atmospheric CO<sub>2</sub> amounts and thereby control the global warming. Estimation of biomass values are vital to determine the carbon contents stored in trees. However, biomass estimation is not an easy task as the trees should be felled or uprooted which are time consuming and expensive procedures. As a solution to this problem, construction of mathematical relationships to predict biomass from easily measurable variables can be used. The present study attempted to construct a mathematical model to predict the stem biomass of *Pinus caribaea* using the data collected from a 26 year old plantation located in Yagirala Forest Reserve in the low country wet zone of Sri Lanka. Due to the geographical undulations of this forest, two 0.05 ha sample plots were randomly established in each of valley, slope and ridge-top areas. In order to construct the model, stem wood density values were calculated by using stem core samples extracted at the breast height point. Stem volume was estimated for each tree using Newton's formula and the stem biomass was then estimated by converting the weight of the known volume of core samples to the weight of the stem volume. Prior to pool the data for model construction, the density variations along the stem and between geographical locations were also tested. It was attempted to predict the biomass using both dbh and tree height. Apart from the untransformed variables, four biologically acceptable transformations were also used for model construction to obtain the best model. All possible combinations of model structures were fitted to the data. The preliminary model selection for further analysis was done based on higher R<sup>2</sup>

values and compatibility with the biological reality. Out of those preliminary selected models, the final selection was done using the average model bias and modeling efficiency quantitatively and using standard residual distribution qualitatively. After the final evaluation the following model was selected as the best model to use in the field.

### **Should we respect the historical reference as basis for the objective of forest restoration? A case study from Northeastern China**

Yao Jing; He XingYuan; He HongShi; Chen Wei; Dai LiMin; Lewis, B. J.; Lv XiaoTao; Yu LiZhong  
*New Forests*; 2014. 45(5):671-686

Under climate change, the adoption of historical reference as the objective of forest restoration is being questioned. In this study, the spatially explicit forest landscape model LANDIS was utilized to analyze how the forest landscape in the upper Hun River area of Liaoning province in northeast China would be affected under current climate trends and future climate change; and to explore whether the historical reference should be the objective of restoration efforts. The results showed that (1) the area percentage (AP) of *Quercus mongolica* under climate change is always higher than that under the current climate regime, while the AP of *Pinus koraiensis* is lower than that under current climate; and (2) the competitive ability of *Q. mongolica* and *Populus davidiana* increases, while that of other species decreases under climate change. As interspecies competition shifts under climate change, the historical reference appears in appropriate to serve as the objective of forest restoration. In addition, although *Q. mongolica* would likely benefit from a warmer and drier climate, use of this species for forest restoration under climate change still requires further research.

### **Testing Aleppo pine seed sources response to climate change by using trial sites reflecting future conditions**

Taibi, K.; Campo, A. D. del; Mulet, J. M.; Flors, J.; Aguado, A.;  
*New Forests*; 2014. 45(5):603-624

Large-scale biogeographical shifts in forest tree distributions are predicted in response to the altered precipitation and temperature regimes associated with climate change. Adaptive forest management to climate change experienced in either stable or rapidly changing environments must consider this fact when carrying out reforestation programs or specifically assisted population migration for conservation purposes. The aim of this study was to compare field performance of eleven seed sources of Aleppo pine outplanted in core and marginal habitats and to assess their phenotypic plasticity for further screening under specific conditions in particular reforestation areas. We hypothesize that current marginal habitat due to low temperature is shifting toward conditions found on the core habitat and that current core habitat will shift toward warmer and drier marginal habitat. Our study reproduced real conditions of reforestation in potential future climatic conditions. Results suggest that it is difficult to predict Aleppo pine provenances' performance in different natural sites from their performance at a single location, even though 'Levante interior' and 'La Mancha' seed sources showed the best overall response among sites. On a site basis, provenances were matched in groups according to their survival and growth responses. Seedlings grown from local seed sources or seed orchards performed better on the core habitat. However, as conditions shifted to marginal habitats, seedlings from climatically similar regions performed better than local sources at least in the short term; our findings suggest that new plantations in areas already affected by global change could be better adapted if they use alternative seed sources.

### **Hydrology-oriented (adaptive) silviculture in a semiarid pine plantation: how much can be modified the water cycle through forest management?**

Campo, A. D. del; Fernandes, T. J. G.; Molina, A. J  
*European Journal of Forest Research*; 2014. 133(5):879-894

Hydrology-oriented silviculture might adapt Mediterranean forests to climatic changes, although its implementation demands a better understanding and quantification on the water fluxes. The influence of thinning intensity (high, medium, low and a control) and its effect on the mid-term (thinned plots in 1998 and 2008) on the water cycle (transpiration, soil water and interception) and growth [basal area increment (BAI)] were investigated in 55-year-old Aleppo pine trees. Thinning enhanced a lower dependence of growth on climate fluctuations. The high-intensity treatment showed significant increases in the mean annual BAI (from 4.1 to 17.3 cm<sup>2</sup>) that was maintained in the mid-term. Thinning intensity progressively increased the sap flow velocity ( $v_s$ ) in all cases with respect to the control. In the mid-term, an increased functionality of the inner sapwood was also observed. Mean daily tree water use ranged from 5 (control) to 18 (high intensity) l tree<sup>-1</sup>. However, when expressed on an area basis, daily transpiration ranged from 0.18 (medium) to 0.30 mm (control), meaning that in spite of the higher transpiration rates in the remaining trees, stand transpiration was reduced with thinning. Deep infiltration of water was also enhanced with thinning (about 30 % of rainfall) and did not compete with transpiration, as both presented opposite seasonal patterns. The changes in the stand

water relationships after 10 years were well explained by the forest cover metric. The blue to green water ratio changed from 0.15 in the control to 0.72 in the high-intensity treatment, with the remaining treatments in the 0.34-0.48 range.

### **Regional forest landscape restoration priorities: integrating historical conditions and an uncertain future in the northern Rocky Mountains.**

Bollenbacher, B. L.; Graham, R. T.; Reynolds, K. M

*Journal of Forestry*; 2014. 112(5):474-483

National law and policy direct the management of the National Forests, with restoring resilient forest conditions being an overarching theme. Climate is a major driver of disturbances that affect ecosystems, especially those with vegetation that show large departures from historical conditions. Drought, fire, insects, and diseases are common forest stressors whose impacts are being exacerbated by climate change. These stressors are threatening the ecosystem services that people value in the forests of the northern Rocky Mountains. The forests of most concern are the dry ponderosa pine and Douglas-fir, moist western white pine mixed with western larch, and cool lodgepole pine mixed with quaking aspen and whitebark pine. Potential reductions in some ecosystem services pose a challenge in terms of not only direct biophysical consequences but also social and economic values that flow from these forests. Values at risk include forest integrity, wildlife habitat, watershed condition, fish habitat, recreation opportunities and investments, community infrastructure, and public safety. This article describes a decision support tool developed by the USDA Forest Service Northern Region in 2010 to support integrated restoration planning. The Northern Region's Integrated Restoration and Protection Strategy (IRPS) is premised on identifying historical conditions through application of the natural range of variability, comparing them with current conditions, and considering a broader range of future issues, including climate change. The IRPS assists managers in the complex task of evaluating factors that influence national forest planning efforts. The assessment and IRPS, by integrating ecological, social, and economic considerations, will help managers of national forests prioritize restoration opportunities using increasingly scarce financial resources. The IRPS will be most beneficial when associated with planning silvicultural practices and fire management directed at restoring the forests of the Northern Region to a more resilient condition.

### **A practical approach for translating climate change adaptation principles into forest management actions**

Janowiak, M. K.; Swanston, C. W.; Nagel, L. M.; Brandt, L. A.; Butler, P. R.; Handler, S. D.; Shannon, P. D.; Iverson, L. R.; Matthews, S. N.; Prasad, A.; Peters, M. P

*Journal of Forestry*; 2014. 112(5):424-433

There is an ever-growing body of literature on forest management strategies for climate change adaptation; however, few frameworks have been presented for integrating these strategies with the real-world challenges of forest management. We have developed a structured approach for translating broad adaptation concepts into specific management actions and silvicultural practices for forest adaptation, as well as an associated set of resources to assist managers in using this approach. A variety of public, private, nongovernmental, and tribal natural resource managers are using this approach to develop projects that implement a diversity of adaptation actions while also meeting manager-identified goals. We describe how managers can integrate climate change information into management planning and activities and provide examples of real-world forest management projects that identify actions to help forests adapt to changing conditions.

### **Snow cover manipulations and passive warming affect post-winter seed germination: a case study of three cold-temperate tree species**

Drescher, M.

*Climate Research*; 2014. 60(3):175-186

Climate change is leading to increased temperatures globally, which may be especially pronounced in cold-temperate regions. During winter, this may cause changes to thermal insulation provided by snow cover to the ground and lead to altered soil and litter layer temperature regimes, affecting plant regeneration and species' ranges through frost damage. I investigated the effects of changing snow cover and litter temperature regimes on post-winter seed germination of 3 cold-temperate tree species, using snow manipulation and passive warming approaches. Snow manipulation and passive warming led to modest but complex changes in litter layer temperature regimes and caused responses in post-winter seed germination, increasing or remaining constant depending on species and treatment. Despite the modest differences in snow cover and litter temperature among treatments, post-winter seed germination varied up to 3-fold. The results suggest that tree seeds may be susceptible to modest changes in winter conditions as expected in the intermediate term under climate change and may be affecting future forest regeneration and species composition. The mechanisms underlying the observed seed germination response are currently unknown, but possible hypotheses are

presented. If confirmed, these mechanisms may be involved in the re-assembly of future species-habitat relationships and control of species' biogeographic ranges.

### **Future impacts of nitrogen deposition and climate change scenarios on forest crown defoliation**

Marco, A. de; Proietti, C.; Cionni, I.; Fischer, R.; Screpanti, A.; Vitale, M.;  
*Environmental Pollution*; 2014. 194:171-180

Defoliation is an indicator for forest health in response to several stressors including air pollutants, and one of the most important parameters monitored in the International Cooperative Programme on Assessment and Monitoring of Air Pollution Effects on Forests (ICP Forests). The study aims to estimate crown defoliation in 2030, under three climate and one nitrogen deposition scenarios, based on evaluation of the most important factors (meteorological, nitrogen deposition and chemical soil parameters) affecting defoliation of twelve European tree species. The combination of favourable climate and nitrogen fertilization in the more adaptive species induces a generalized decrease of defoliation. On the other hand, severe climate change and drought are main causes of increase in defoliation in *Quercus ilex* and *Fagus sylvatica*, especially in Mediterranean area. Our results provide information on regional distribution of future defoliation, an important knowledge for identifying policies to counteract negative impacts of climate change and air pollution.

### **Fuel reduction burning mitigates wildfire effects on forest carbon and greenhouse gas emission**

Volkova, L.; Meyer, C. P.; Murphy, S.; Fairman, T.; Reisen, F.; Weston, C  
*International Journal of Wildland Fire*; 2014. 23(6):771-780

A high-intensity wildfire burnt through a dry *Eucalyptus* forest in south-eastern Australia that had been fuel reduced with fire 3 months prior, presenting a unique opportunity to measure the effects of fuel reduction (FR) on forest carbon and greenhouse gas (GHG) emissions from wildfires at the start of the fuel accumulation cycle. Less than 3% of total forest carbon to 30-cm soil depth was transferred to the atmosphere in FR burning; the subsequent wildfire transferred a further 6% to the atmosphere. There was a 9% loss in carbon for the FR-wildfire sequence. In nearby forest, last burnt 25 years previously, the wildfire burning transferred 16% of forest carbon to the atmosphere and was characterised by more complete combustion of all fuels and less surface charcoal deposition, compared with fuel-reduced forest. Compared to the fuel-reduced forests, release of non-CO<sub>2</sub> GHG doubled following wildfire in long-unburnt forest. Although this is the maximum emission mitigation likely within a planned burning cycle, it suggests a significant potential for FR burns to mitigate GHG emissions in forests at high risk from wildfires.

### **Climate Change and European Forests: What do we know, what are the uncertainties, and what are the implications for forest management?**

Lindner, M., Fitzgerald, J.B., Zimmermann, N.E., Reyer, C., Delzon, S., van der Maaten, E., Schelhaas, M.-J., Lasch, P., Eggers, J., van der Maaten-Theunissen, M., Suckow, F., Psoomas, A., Poulter, B., Hanewinkel, M.

*Journal of Environmental Management* 146, 69-83.

The knowledge about potential climate change impacts on forests is continuously expanding and some changes in growth, drought induced mortality and species distribution have been observed. However despite a significant body of research, a knowledge and communication gap exists between scientists and non-scientists as to how climate change impact scenarios can be interpreted and what they imply for European forests. It is still challenging to advise forest decision makers on how best to plan for climate change as many uncertainties and unknowns remain and it is difficult to communicate these to practitioners and other decision makers while retaining emphasis on the importance of planning for adaptation. In this paper, recent developments in climate change observations and projections, observed and projected impacts on European forests and the associated uncertainties are reviewed and synthesised with a view to understanding the implications for forest management. Current impact assessments with simulation models contain several simplifications, which explain the discrepancy between results of many simulation studies and the rapidly increasing body of evidence about already observed changes in forest productivity and species distribution. In simulation models uncertainties tend to cascade onto one another; from estimating what future societies will be like and general circulation models (GCMs) at the global level, down to forest models and forest management at the local level. Individual climate change impact studies should not be uncritically used for decision-making without reflection on possible shortcomings in system understanding, model accuracy and other assumptions made. It is important for decision makers in forest management to realise that they have to take longlasting management decisions while uncertainty about climate change impacts are still large. We discuss how to communicate about uncertainty e which is imperative for decision making e without diluting the overall message. Considering the range of possible trends and uncertainties in adaptive forest management requires expert knowledge and enhanced efforts for providing science-based decision support.

## **Economic consequences of increased bioenergy demand**

Johnston, C.M.T. & van Kooten, G.C.

*The Forestry Chronicle*, 2014, 90(5): 636-642

Although wind, hydro and solar are the most discussed sources of renewable energy, countries will need to rely much more on biomass if they are to meet renewable energy targets. In this study, a global forest trade model is used to examine the global effects of expanded demand for wood pellets fired with coal in power plants. Positive mathematical programming is used to calibrate the model to 2011 bilateral trade flows. To assess the impact of increased demand for wood pellets on global forest products, we consider a scenario where demand for wood pellets doubles. Findings indicate that production of lumber and plywood is likely to increase in most of the 20 model regions, but outputs of fibreboard, particleboard and pulp will decline as these products must compete with wood pellets for residual fibre. Ultimately, policies promoting aggressive renewable energy targets cause wood pellet prices to more than double in our scenarios, which could increase the cost of generating electricity to such an extent that, in some regions, electricity producers will continue to use fossil fuels as their primary fuel, while some others might find it worthwhile to rely more on nuclear energy for base load power.

## **V. PUBLICATIONS, REPORTS AND OTHER MEDIA**

### **Climate change and primary industries: Impacts, adaptation and mitigation in the Nordic countries**

*The Nordic Council of Ministers*

Climate change is expected to have a profound impact on natural resources, and thus on the primary industries (agriculture, forestry and fisheries) in the Nordic countries. Climate change induces risks but also creates possibilities for new production systems on land and in the ocean. Climatic changes also represent great challenges for policy-making and management regimes. The current knowledge base on natural resources in the Nordic region needs to be expanded to fully address the impacts of climate change. In particular it is important to address the need for improved policies and new policy instruments. The research programme Climate Change Impacts, Adaptation and Mitigation in Nordic Primary Industries is a coordinated set of thematic research networks with the objective to create a Nordic knowledge base on climate change interactions with primary industries in the Nordic region. [The publication](#)

### **Forests. New York Declaration on Forests Action Statements and Action Plans**

*United Nations*

This document summarizes the wealth of announcements on forests at the UN Secretary-General's Climate Summit, including the New York Declaration on Forests, its associated voluntary Action Agenda, and a large number of supportive concrete action announcements. [The publication](#)

### **The new climate economy**

*WRI*

The next 15 years will be critical, as the global economy undergoes a deep structural transformation that will determine the future of the world's climate system. It will not be "business as usual". The global economy will grow by more than half, a billion more people will come to live in cities, and rapid technological advance will continue to change businesses and lives. Low-carbon and climate-resilient growth is possible. The capital for the necessary investments is available, and the potential for innovation is vast. What is needed is strong political leadership and credible, consistent policies. But without urgent action, warming could exceed 4°C by the end of the century, with extreme and potentially irreversible impacts. This report lays out how countries across the world can reduce the risks of climate change and achieve high-quality, resilient, and inclusive economic growth. [The publication](#)

### **Community forestry and community-based landscape management for safeguard information systems**

*RECOFTC*

Community forestry offers a tried and true model for approaching national Safeguard Information Systems (SIS) under REDD+. RECOFTC agrees with the global consensus that REDD+ SIS should be based upon existing, equitable and participatory systems. The role that might be played by community forestry is detailed in

RECOFTC's recent submission response to the UNFCCC SBSTA call for guidance on "types of information from systems for providing information on how the safeguards are being addressed and respected (under REDD+)." [The publication](#)

## **Regional Research in Support of the Second Phase of the High-Level Panel on Global Assessment of Resources for Implementing the Strategic Plan for Biodiversity 2011-2020**

*UNEP and CBD*

This document is a compilation of the reports of six regional reviews undertaken in support of the second phase of the High-level Panel on the Global Assessment of Resources for Implementing the Strategic Plan for Biodiversity 2011-2020. [The publication](#)

## **Increasing community rights to forests: A solution to forest degradation?**

*USAID*

Policymakers and international donors have long believed that putting control of forest resources in the hands of communities could incentivize sustainable forest practices, reverse forest degradation, and improve forest condition. Over the past two decades, a growing body of research has pointed to these linkages, and in an effort to incentivize communities to conserve and regenerate forest resources, payment-for-performance schemes, such as Reducing Emissions from Deforestation and Forest Degradation (REDD+), have been designed at the international and national levels. These programs are built on the premise that sustainable forest management will occur if local communities obtain greater rights to land and forest resources. New research, however, shows that the evidence of this relationship remains circumstantial and highlights the need for dedicated research to better understand these linkages. An extensive USAID-funded literature review produced by Michigan State University tested the assumption that devolving rights to communities to manage forests improves forest condition, and found that there is not enough conclusive evidence to prove a direct causal link between community forest rights and improved forest condition. [The publication](#)

## **Understanding key positions of the Least Developed Countries in climate change negotiations**

*IIED*

By December 2015, a new climate change agreement must be in place under the United Nations Framework Convention on Climate Change (UNFCCC). International progress is slow, but the Least Developed Countries (LDCs) are being proactive. Two milestones in the timetable for an agreement are fast approaching. First, countries attending the next annual Conference of the Parties are to agree elements of a draft negotiating text. Secondly, by early 2015 parties will start communicating how they will contribute to the new agreement. The UN Climate Summit in September is designed to mobilise political will for the process, and the LDCs will be active participants. This briefing sets out three of the LDC's key positions: on a 1.5 degree pathway, on a binding regime and on achieving a comprehensive agreement. [The publication](#)

## **V.I JOBS**

### **Associate Programme Management Officer**

*UNEP - deadline for application is 26<sup>th</sup> of October 2014*

UNEP is seeking an Associate Programme Management Officer for the UN-REDD programme to be based in Geneva. [More](#)

### **Chief Technical Advisor, UN-REDD Sri Lanka Programme**

*FAO - deadline for application is 15th of November 2014*

FAO is seeking a Chief Technical Advisor for the Sri Lanka UN-REDD programme. [More](#)

## **VII. ANNOUNCEMENTS**

### **FAO sets standards to improve national forest monitoring systems**

*FAO*

FAO has launched free software tools that it hopes will improve the way many developing nations monitor the

state of their forests to tackle deforestation and climate change. The tools are designed to assist countries through the entire lifecycle of a forest inventory - from assessment, design and field data collection to analysis and reporting. The governments of Finland and Germany have supported the development of the software called Open Foris. [More](#)

## **CLIM-FO INFORMATION**

The **objective** of CLIM-FO-L is to compile and distribute recent information about climate change and forestry. CLIM-FO-L is issued monthly.

Past issues of CLIM-FO-L are available on the website of **FAO Forest and Climate Change**:

<http://www.fao.org/forestry/climatechange/en/>

For technical help or questions contact [CLIM-FO-Owner@fao.org](mailto:CLIM-FO-Owner@fao.org)

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