



RESEARCH LETTER

# On Resources for the Future

sustainable development – poverty alleviation – new forest products – governance – green economy – forest ecosystem services – bio-economy – anthropogenic forests



## ENSURING ECOSYSTEM SERVICES FOR OUR CHILDREN

Forests are critical to the future welfare of the world's population. They play an important role in sustainable development and poverty alleviation. Forests provide health benefits for humans, and wood is not only aesthetically pleasing, but is also the world's most sustainable building material.

In much of Africa and parts of Asia forests remain a critical source of firewood. Recently, the value of wood as a source of renewable energy has also been recognized in developed countries.

## NEW PRODUCTS AND POTENTIAL MARKETS

In addition to its use as a source of energy, wood has traditionally been used for construction and for paper-making. Such uses are evolving, and we are getting better and better at constructing large wooden structures using engineered wood products.

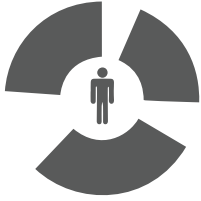
A wide range of uses are apparent for the components of wood, and many of these are now commercialized. For example, the use of wood in biotextiles has become wide-

spread, with today's products being much more sophisticated than some of the products developed in the 20th century. A variety of new products are emerging, such as nanocrystalline cellulose and related products, and these will gradually become commercialized.

Forests are likely to play a pivotal role in a green economy. Creating the policy space and supportive mechanisms to enable this is of central importance.

*Improving the sustainable use of forests in turn contributes to larger goals such as reducing climate change, improving water quality and pollution control.*

**John Innes,  
University of British Columbia, Canada**



## KNOWLEDGE GAPS

The new products and services coming from forests are associated with governance issues as these new product value chains have to be effectively managed. This involves identifying the products, potential markets, most appropriate fibre sources to maximize value and assessing how they may best be managed.

The development of some of these products may generate competition with other products, both inside and outside the forest. Examples include competition for feedstocks between pulp mills and biorefineries, the conversion of natural forests to plantations, and the conversion of agricultural land to biofuel plantations. Consequently, new governance modalities and even new institutions may be necessary.

## IUFRO'S TASK FORCE "RESOURCES FOR THE FUTURE"

This Research Letter summarizes the findings of IUFRO's Task Force "Resources for the Future" between 2011 and 2014. The Task Force has focused on mechanisms and approaches to further the sustainable use of forest resources, drawing on a triple bottom line perspective, including environmental, social and economic sustainability. The researchers also included an additional governance perspective, since robust governance is identified as a leading factor in the unsustainable use of forests (and their degradation). The Task Force gave insight into the design of policies and institutions to support the sustainable use of forests, and forest products, to advance the green economy. The topic of the Task Force is related directly to the Millennium Development Goal of environmental sustainability and tangentially with the goal of poverty alleviation.



**John Innes (Task Force Coordinator, [john.innes@ubc.ca](mailto:john.innes@ubc.ca)),**

**Jung-Hwan Park (Task Force Deputy Coordinator, [hwanpark@forest.go.kr](mailto:hwanpark@forest.go.kr))**

## SUSTAINABLE MANAGEMENT OF FORESTS

A new book entitled “**Forests and Globalization: Challenges and opportunities for sustainable development**” draws attention to some important issues related to managing forests in a sustainable and responsible way (Earthscan Publishers, 2014). The book will be available in time for the IUFRO World Congress in October 2014. Task Force authors contributed to the book, among others, on the following three subjects:

### HOW TO DESIGN PAYMENTS FOR FOREST ECOSYSTEM SERVICES

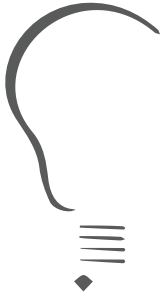
Sven Wunder, senior economist with CIFOR, documents from his work experience in the field that payments for forest ecosystem services are likely to meet the principles of effectiveness and efficiency, so long as they are performance based (i.e. payments based on clear and measurable outcomes, such as improved forest health), voluntary and customized to local setting and context (e.g. payments reflect local growing conditions; for instance a scheme from tropical areas is unlikely to work in the slow growing temperate rainforests). However, he documents that these arrangements are institutionally demanding and costly. Policy concerns around leakage (which is where increased requirements on proponents, such as to engage in offset programmes, mean that proponents move to a jurisdiction with less strict standards) are less significant than previously thought, while heterogeneities in space (services, leverage and cost) are more important drivers of efficiency.

### THE DEVELOPMENT OF APPROPRIATE PLANTATIONS

Luis Neves Silva, a forest engineer from the WWF, documents that to contribute to the objective of near-zero forest loss, well-managed plantations are essential on degraded lands and contribute to restored ecosystems. WWF has developed a “New Generation Plantation” concept, which seeks to set the standard for plantations, including maintaining ecosystem integrity, protecting sites of high conservation values, and the importance of engaging with and accommodating stakeholders in the development of plantations.

### MOVING INTO THE BIO-ECONOMY

Don Roberts (Nawitka Capital Advisors) and David Cohen (UBC) have explored the requirements for forest companies moving into the bio-economy and competing with non-renewables. They observe that the bio-economy is anticipated to replace declining paper markets in North America and Europe. However, the regulatory framework is largely un-developed and for many countries these markets are untested. Cohen observes that many forest companies are under-capitalized to pursue opportunities in the bio-economy, and competing with non-renewables is not yet feasible at large scales. While Roberts highlights that much of the activity around bio-fuels is coming from agricultural based feedstock, he notes that attention is likely to grow over time, but will be dependent on a supportive regulatory framework.



## LESSONS LEARNED

It is evident that much research is being done on the themes related to forest resources for the future such as potential market-based approaches to protect forest ecosystem services, the development of appropriate plantations, and an understanding of the consequences arising from the creation of new products and uses from forests. However, the work is scattered and uncoordinated, and is at vastly different stages of development in different places.

Europe appears to be the most advanced followed by North America, but countries such as Brazil and China are developing their expertise rapidly, and may actually be ahead in terms of the application of some of the latest developments. For example the expansion of selectively-bred eucalyptus plantations in Brazil has turned the country into a world leader in pulp production, and there is significant activity to develop strains in Brazil to create a fast growing eucalypt for bio-energy. In China, genetically modified trees have been deployed, whereas most other parts of the world maintain moratoriums on their use.

While vertically-integrated forest companies exist in many parts of the world, there have been few attempts to link the upstream and downstream ends of the forest sector. The clearest example comes from the development of specialized eucalyptus plantations in Brazil where a significant focus on research and development in tree breeding has led to competitive advantages in the market place. Interestingly, it is here that links to conservation interests are strongest.

The need for such efforts to effectively address social concerns has been recognized, while at the same time their commercial viability has been underpinned by a number of sector-wide initiatives. WWF's New Generation Plantation concept provides an example of where the potential value of plantations has been recognized, with considerable efforts being made to integrate industrial plantations with natural forests across landscapes in Brazil. The move towards a landscape approach is particularly important, and is being echoed in many other parts of forestry, such as the mitigation of, and adaptation to, climate change.



## CONCLUSIONS

There is a strong need for policy makers to take a more holistic view of the forest sector.

Research efforts have often focused on the downstream end of the sector: the products. In a future world, there needs to be better integration with the upstream aspects of the sector. This requires a more holistic approach to the development of the forest sector, including the consideration of landscapes as a basic unit.

For example, increased removals of wood from the landscape need to be matched to increased demands for land for food production and increased demands for the ecosystem services provided by forests.

Communication between different groups must be encouraged, e.g. amongst different departmental interests within a government. At the current time, there is ample evidence that such communication is limited; in future, it should be much more ubiquitous.

