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on Forest Economics and Statistics

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**FOOD AND AGRICULTURE
ORGANIZATION**

European Forestry Commission

Economic Aspects of Sustainable Forest Industry

Note by the secretariat

I. Background

1. Forest industry can contribute to sustainable development in many different ways. The industry is often the largest source of investment in the forestry sector and accounts for the majority of income and employment as well. Furthermore, it can have a major impact on the way that forests are managed and can increase or reduce the sustainability of the sector as a whole.
2. Although there have been numerous assessments of the sustainability of forest management at the local, national and international levels, there has been relatively little analysis of the sustainability of the forest industry, especially at the global level. The issues, concerns and opportunities for sustainable development in the forest industry are quite different to those related to forest management, so it would be useful to examine recent trends and developments in the forest industry to gain a better understanding of how the sustainability of the sector as a whole might be improved.
3. The on-going financial and economic crisis puts a special flavor to this assessment. Crisis is not to be missed, because it eventually helps changing the structure and the direction of the industry. Forest industries are in a state of transformation, and this will have tangible impacts on output, raw material use and employment. Pace of change differs between countries. *The Working Party members will be asked to quantify the impact of the crisis and comment on the future of forest industries in their national contexts.*

II. Purpose of Work

4. FAO has chosen a special theme “Sustainable Forest Industries” for 2011 State of the World’s Forests report. This part of the report will identify and describe some of the *major driving forces affecting forest industry development and analyze their impact on the sustainability of the industry* (in the usual three dimensions of economic, social and environmental sustainability). A related objective will be to examine the *impact of public policies on the forest industry and its sustainability*.
5. Sustainable forest industries – what does it mean? Basically, we are talking about getting more from less (the “development” part of sustainable development). The “sustainable” part is about not running down stocks of capital (usually meaning natural capital). To some extent this is infeasible – almost all industrial development has a consuming impact on the environment - so we should be talking about minimising impacts on the environment and preferably, where possible, keeping these within acceptable limits.
6. How do industries do this? It is usually done by getting more products and value out of resource use. This can be done by better trained workforce and working methods, processes, technologies, using wastes, developing new products, etc. Use of resources not only means getting more out of the wood, but also less use or more efficient use of other resources (energy, land, water). There is also a social dimension, meaning industries should generate employment and income, improve workers’ conditions and generally improve social conditions in places where they operate.

III. Approach and timetable

7. Our approach in carrying out the assessment is to create and maintain a collaborative online *wiki*. In the context of our study wiki means a collaborative website for a chosen community to develop and review the assessment on sustainable forest industries. The use of a *wiki* is proposed to amplify the process of developing, reviewing and commenting on text and to allow open and transparent peer review from a wide group of individuals and institutions who may not normally be invited to comment on the technical work of FAO.

8. The *wiki* will be developed and implemented in three main stages during 2010:
 - January-March 2010: Development of overall structure and content (thematic reviews, trend and outlook analyses and specific examples), followed by drafting of text by FAO and invited authors;
 - Apr-Jun 2010: Peer review, redrafting, submission of additional text (on a selective basis) and the extraction of the body of SOFO 2011 text;
 - Jul-Dec 2010: Dissemination of the material to the general public for review, comment and consultation for a wider purpose, i.e. for work programming at FAO, outlook studies, workshops, stand-alone publications, etc.
9. Some preliminary suggestions for content and contributors to the *wiki* are provided in this note. Contributors to the *wiki* will include the following:
 - contributors and editors: who will develop the overall structure and content, contribute text and review and comment on other contributions (with widespread access for editing and commenting);
 - peer reviewers: who will comment on the structure and content (with widespread access for commenting);
 - invited authors: who will produce text on specific issues and can comment on other contributions (with limited access for editing and widespread access for commenting);
 - stakeholder community: who will be invited to review and comment on the material from July 2010 onwards (with widespread access for commenting and access for editing as appropriate).
10. Interested Working Party members may be enrolled to contribute on specific thematic areas of their interest, which are discussed later in this document.

IV. Results

11. The results from this *wiki* will be used in four main ways:
 - State of the World's Forests 2011: a special chapter on "Sustainable Forest Industries" is produced and contents will be selected from the text developed in the *wiki*;
 - support to outlook studies: some of the *wiki* text may be reproduced as separate, stand-alone publications or may be developed into larger publications as part of FAO's programme of work on thematic outlook studies;
 - policy development: some parts of the text may be used or further developed for discussion and dissemination at policy fora, workshops and other technical events; and
 - work programming: information and experiences gained from the development of the *wiki* may be used to guide work programme development in the area of forest industries within the FAO Forestry Department.

V. Elements of assessment

12. Here we briefly describe some of the important elements in assessing where the sustainability of the forest industries is decided. *The Working Party members are asked to comment upon issues according to their capacity, as requested at the end of each chapter.*

A. Driving forces

13. Background: There is a multitude of driving forces, often pointing at different directions, which influence forest industries. One of FAO's underlying assumptions is that the external drivers and policies are often producing outcomes that are narrowing the decision-making space and the

degree of freedom of forest industry. They may also produce unequal and unwanted consequences among the industries and their clients. In other words, the societal and environmental contract of the industry is changing and some aspects will be controversial in the short to medium term.

14. Some of the global and regional drivers we highlight are:

- rapid population increase in the Southern hemisphere,
- stagnating or declining population in many countries of the Western world,
- changing geo-political landscape
- peak of fossil fuel and some key minerals and metals with energy constraints and high energy costs,
- escalating demand for wood energy, which sometimes competes with fibre for traditional wood-using industries.
- increased food demand leading to land-use changes,
- changing climate, water scarcity, and related conflicts,
- technological developments and innovations,
- potential for environmental services from forest ecosystems,
- increasing demands on forests, including for protection of biodiversity, recreation, etc. which constrain fibre production,
- increased globalization of forest products, which has and will continue to modify historical wood fibre flows and regional competitiveness,
- trade policies and carbon footprint.

B. Wood and fibre supply for industry

15. Background: Wood supplies are abundant and prices are not going up, but wood is probably getting more difficult to obtain. More is coming from the private owners where supply is fragmented in small parcels and widely dispersed. Industrial wood supply is more coming from planted trees (inside and outside forests), which are growing faster and yield different wood properties (generally smaller sized, less clear wood, lower strength properties, etc.).

16. To think and discuss:

- Is current wood supply “fit for purpose” = suitable to our current and future needs?
- Genetically Modified Trees – what is happening, is it going to help, is it going to be allowed to help (policy dimension)?
- What is the industry doing to deal with the wood/fibre supply issue?
- How is the industry dealing with social and environmental demands placed upon them (when growing trees and gaining access to other forest resources)?
- What are the trends in recycling and their impacts?

17. Key questions regarding sustainability:

- Are we getting more from the land (e.g. higher tree growth, better utilization of forest resources, better organization of forest owners, use of minor species, etc.)?
- Is this wood supply sustainable (i.e. how sustainable are the industry’s efforts to increase potential wood supply)?

C. Harvesting – converting potential wood supply into delivered fibre

18. Background: Harvesting wood is probably the most sensitive part of the industry value-adding chain in terms of sustainability, public opinion, etc. There is a vast range of harvesting techniques, methods and approaches that are designed to run operations in different forest

conditions. There have been major trends towards mechanisation in almost all countries, but some are still far behind others (maybe for good reasons). Harvesting is not just driven by cost, but also by environmental issues, particularly during the planning of operations. Mechanised harvesting has important safety benefits for forest workers.

19. To think and discuss:

- There is general agreement about what constitutes “good” forest harvesting and we have this in various codes etc., but what has been the progress with implementing these codes?
- What is happening in terms of innovations and technology driving down costs and improving environmental outcomes?
- Are we reducing harvesting wastes (e.g. grading issues, RIL, biomass collection)? What are the impacts on sustainability?
- Are we adding more value (e.g. grading systems, sorting, logistics)?
- How is the industry dealing with social and environmental demands placed upon them?

20. Key questions regarding sustainability:

- Are we getting more from the forest (e.g. higher value added in forestry, lower harvesting costs, less logging wastes, etc.)?
- Is this sustainable (e.g. fewer accidents, less environmental impacts)?
- What is happening to the forestry employment?

D. Processing – converting wood and fibre into final products

21. Background: It appears that the conventional business model of forest industry has continued unchallenged for too long, what has lead to the erosion of markets, to structural overcapacity and falling product prices. Most of the traditional products are not expected to earn their cost of capital in a normalized environment (out of this crisis). The financial returns expected from pulp and paper products are simply not good enough, except among the lowest-cost producers. Despite the inevitable volatility, the sawn timber industry is expected to generate more acceptable returns in the long term. This is important in justifying the cost of extensive forestry operations, and ensuring sawmilling industry’s ability to pay a higher price/m³ for high-quality logs.

22. Different forms of bio-energy will be the first vehicles to break away from the traditional forest industry structures and patterns. Pellets are the fastest-growing form of bio-energy. Many of the emerging liquid bio-energy products are still not attractive. Aside from some technical challenges, they are often too capital intensive, and do not generate enough value added. A state of a case is ethanol via bio-chemical processes using wood.

23. The bio-refinery concept offers some of the most promising emerging options. The leading forest industry companies are taking a closer look at bio-products (i.e. pulp, bio-energy, bio-chemicals) produced via the fractionation approach on a pulp platform. However, the energy sector may take the driver’s seat due to its financial strength.

24. Points of assessment in pulp & paper industry:

- industry employment, supply chain issues and restructuring,
- the quality of capital stock, physical assets, restructuring and consolidation, and advances of processing technologies in different regions (BAT),
- trends in emissions, energy-efficiency, effluents, water usage,

- identify the potential breakthrough technologies and new business models where pulp & paper industry would move in the next 10-20 years,
- explain what opportunities integration with bio-energy and chemical bio-products would bring to pulp & paper industry,
- roughly estimate the market size and prices of chemical bio-products achievable from the bio-refinery approach.

25. Points of assessment in mechanical wood industry:

- industry employment, supply chain issues and restructuring,
- gradual improvements in processes and products to meet existing needs in the market,
- more mechanization (fewer jobs and lower manufacturing costs), more optimization (more and better quality products),
- examples of product substitution: MDF replacing sawnwood in mouldings, cabinet doors, OSB replacing plywood, etc.,
- use of waste into solid bio-energy (energy chips, pellets, briquettes),
- composite materials, nanotechnology, etc.
- green building and building system development.

E. End-uses – forest industries contribution to sustainable living

26. Background: End-uses are ultimately the source of revenue that pays for the majority of forest management. Forest products face a number of challenges in terms of competition with non-wood alternatives (solid materials and new media). However, the industry is constantly adapting to these challenges through product innovation, marketing, etc.

27. To think and discuss:

- What are the main drivers in end-use markets (now and in the future)?
- Are wood products competitive against the alternatives and are they profitable?
- Are wood products more sustainable than comparable materials (life cycle analysis etc.)?
- Do green markets really exist? Are they profitable, are they worth it?
- Are the wood and paper industries doing a good job in product differentiation and promotion?

F. Technology and innovation

28. Background: This short section provides some explanations for the non-specialist of the different types of innovation (revolutionary, evolutionary, disruptive), with illustrations from the forest products sector.

29. Evolutionary innovations: Gradual improvements in processes and products to meet an existing market need; many examples in wood products and in harvesting (e.g. gradual move from manual to cut-to-length, low-impact harvesters, combined industrial roundwood & bio-energy harvesters, integrated ICT systems, etc.).

30. Revolutionary innovation: Radical improvements in processes and products to meet an existing market needs, many examples of product substitution – e.g. wood and metal vs. plastic window frames, cardboard cartons vs. glass and plastic bottles, e-mail replacing writing paper, internet replacing newspaper.

31. Low-end disruptive innovation: New products and processes capturing bottom end of a market, then moving upwards – e.g. low-cost particleboard, ready-to-assemble (or flat-pack) furniture replacing expensive solid-wood furniture in the 1970-1980s, then gradually moving into higher-end markets.

32. New market disruptive innovation: New products and processes meeting new needs: e.g. wood pellets – entirely new way of delivering fuelwood to end-users, overcoming disadvantages (wet, bulky) of traditional fuelwood and meeting an emerging market segment (subsidised domestic bio-energy users). Biorefinery products and biomaterials may be the next examples.

33. To think and discuss:

- What is the current status of innovation in the sector?
- How can technology and innovation drive up value-added?
- What innovation might be needed in the future (links to broader trends in environment, economies and society)?

G. Public policies

34. Background: This section should describe *what*, *why* and *how* public intervention in support of sustainable forest industry development can be done, and give some specific examples of what countries are doing.

35. Why should governments intervene and how?

36. Why: Correct market failures, public-good nature of science and technology, pave the way for sustainable consumption with public procurement rules, etc.

37. How: Regulation, fiscal policies, direct action, information and facilitation, etc. Note that interventions can be indirect (e.g. recycling policies having indirect impact on fibre supply).

38. Examples by type: generic policies - recycling; pollution control; energy efficiency; renewable and bio-energy; specific policies - government R&D; green building; building codes; promotion programmes.

39. Examples by countries: Canada; the USA; UK; the EU; New Zealand; Brazil; Australia; Malaysia; France; Nordic countries; etc.

VI. Summary and conclusions on sustainable forest industries

40. We are aiming for 8-10 key messages, mainly from two angles:

- Outlook: How is the landscape for forest industries changing, what are they doing to adapt, what more needs to be done, what can public policies do to assist their sustainability?
- Transfer of knowledge, technology and experience: How can developing countries learn from the developed countries, and how can technology help in achieving sustainable forest industry in the foreseeable future?

41. Finally, we hope to establish a Roadmap on how FAO Forestry Department programmes can optimally assist forest industry.

VII. Questions for Working Party members to comment from their national perspectives

42. We would like to take stock of your country situations. We ask the Working Party members to quantify the impact of the current crisis, and comment on the future of forest industries from their national perspectives, as follows:

- *Can you quantify the impact of the current financial crisis 2008-2010 in your country on:*
 - *logging companies (nr. of firms, capacity closures, % change in m³ produced)*
 - *mechanical forest industries (nr. of mills, capacity closures, change in m³ produced)*
 - *pulp & paper mills (nr. of mills, capacity closures, % change in tons produced)*
- *What has been the direct impact of the crisis on employment in forestry and forest industries?*
- *What are the “next-generation products” and promotional actions provided by the forest industries in your country?*
- *Have government stimuli packages had any significant direct or indirect impact on bringing forest industries back on track?*

Contributions to these questions are welcome: during the Working Party meeting; and afterwards to: *Jukka.Tissari@fao.org*