Plantations development and sustainability

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CFS MEETING ON SUSTAINABLE FORESTRY FOR FOOD SECURITY AND NUTRITION

Plantation forest

Planted forests that are intensively managed and meet all the following criteria at planting and stand maturity:

- one or two species;
- even age class; and
- regular spacing.

Specifically excludes:

- forest planted for protection or ecosystem restoration;
- non forests (palm oil, agricultural trees)
Outline

Introduction

1) The development of plantations
2) Drivers of plantations development
3) Sustainability hotspots
4) Pathways to improve sustainability of plantations
Expansion of planted forests

Planted forests - Area (million ha)

Planted Forest
Forest predominantly composed at maturity of trees established through planting and/or deliberate seeding. Planted forest includes plantation forest (not yet separated in the statistics) and other planted forest

Source FAOstat
<table>
<thead>
<tr>
<th>Million ha</th>
<th>1990</th>
<th>2015</th>
<th>Change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>World</td>
<td>182</td>
<td>287</td>
<td>57.9</td>
</tr>
<tr>
<td>Asia</td>
<td>75</td>
<td>129</td>
<td>71.0</td>
</tr>
<tr>
<td>Europe</td>
<td>61</td>
<td>80</td>
<td>31.7</td>
</tr>
<tr>
<td>North and Central America</td>
<td>23</td>
<td>43</td>
<td>85.7</td>
</tr>
<tr>
<td>Africa</td>
<td>12</td>
<td>16</td>
<td>39.5</td>
</tr>
<tr>
<td>South America</td>
<td>8</td>
<td>14</td>
<td>80.1</td>
</tr>
<tr>
<td>Oceania</td>
<td>3</td>
<td>4</td>
<td>56.9</td>
</tr>
</tbody>
</table>

Source: FAO
Drivers of plantations’ expansion

1. **Increased demand for wood**, driven by population and economic growth, that will continue;

2. **Political commitments**, pressure, and incentives for:
   - using wood as a substitute to more polluting, non-renewable, energy intensive materials (also as mitigation of climate change);
   - restoration of degraded land;
   - afforestation to mitigate climate change and/or adapt to climate change.

3. **Economic actors** seeking to benefit from the above, and to **diversify financial investments**.
Planted forests and roundwood production

<table>
<thead>
<tr>
<th>Area</th>
<th>Natural forests</th>
<th>Planted forests</th>
</tr>
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<tbody>
<tr>
<td>93%</td>
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| Roundwood production | 53% | 47% |

Source: FAOstat
Wood consumption per capita: considerable differences

Consumption per capita (m$^3$/1000 persons) 2018

- Green: Industrial roundwood
- Red: Wood fuel

Source: FAOstat
<table>
<thead>
<tr>
<th>Sustainability hotspots</th>
<th>Potential negative impacts of large scale intensive monoculture plantations</th>
<th>Bibliographical references</th>
</tr>
</thead>
</table>
| **Biodiversity**        | Monoculture and pesticide application  
                          | Use of exotic species can cause invasions and imbalances in natural biological processes  
                          | Fragmentation of natural forest stands  
                          | Deforestation of natural forests | IIED, 1996, Cossalter & Pye-Smith, 2003; Michon, 2003; Brockerhoff et al., 2008; Van Bodegom et al., 2008; Barua et al., 2014; Duponnois et al., 2014; Abood et al., 2015; Andersson et al., 2015; Cateau et al., 2018; Liu et al. |
| **Soil quality**         | Chemical pollution, soil compaction and erosion | Van Bodegom et al., 2008; Barua et al., 2014; Andersson et al., 2015; Cateau et al., 2018; Liu et al., 2018; Malkamäki et al., 2018 |
| **Water resources**      | The use of pesticides causes chemical pollution of the water resource  
                          | Water resources overexploited | Cossalter & Pye-Smith, 2003; Van Bodegom et al., 2008; Andersson et al., 2015; Cateau et al., 2018; Liu et al., 2018; Malkamäki et al., 2018 |
| **Social and economic development** | Low job creation per hectare  
                          | Frequent social conflicts, particularly around land issues  
                          | Fosters rural exodus | Cossalter & Pye-Smith, 2003; Enters et al., 2004; Van Bodegom et al., 2008; Barua et al., 2014; Andersson et al., 2015; Cateau et al., 2018; Liu et al., 2018; Malkamäki et al. |
| **Resilience and long term production** | Monospecific plantations are the most susceptible to diseases and pests  
                          | Monospecific plantations seem to be the least resilient to climatic phenomena and therefore to future climate change | Cossalter & Pye-Smith, 2003; Barua et al., 2014; Cateau et al., 2018; Liu et al., 2018 | Peroches, forthcoming |
What makes the difference?

Potential **impacts of plantations expansion** and contribution to the SDGs and to the Paris agreement finally depend on three factors:

1. Where this expansion is going to take place, what are plantations going to replace;

2. The type of production/management system, yield, overall efficiency, including impacts on water and biodiversity;

3. The way it benefits to smallholders and local populations.
Sustainable plantations development

• **Limit negative impacts** of land use change
• **Regulate** land concessions
• **Support** smallholders and farmer groups
• **Facilitate** the development of adapted diversified systems

• **Requires:**
  • A combination of measures;
  • Coordinated action between different categories of actors.
Limit negative impacts of land use change

• Limit land needs:
  • Improve yield
  • Facilitate multiple uses

• **Limit land use change impacts** through zoning and landscape approaches:
  • Preserve important areas for biodiversity conservation and sustainable management
  • Ensure biodiversity corridors
  • Land use zoning and planning to prevent the conversion of forest
  • Planning mixed landscapes

• **Ensure the protection** of existing tenure and use rights

• **Beware of the situation** of all users (including marginalized)
Control land concessions

Regulation and implementation of land concessions can limit negative social and environmental impacts, and support positive ones:

- Land zoning planification
- Right of communities to decide to concede lands by FPIC
- Fair compensation for lost assets and use rights
- Adequate and fair wages and working conditions
- Promote management practices that are more favorable to biodiversity and that provide more diverse livelihood opportunities
- Encourage private companies to share technology and genetic material with small holders and facilitate access to markets
Improve contributions of large-scale plantations to economic and social sustainability

• Recruitment, training, wages and working conditions
• Laws and regulations, monitored and enforced.
• Social protection schemes.
• Recruitment policies and types of contracts
• Participation of local communities and technology transfer.
Support smallholders and farmer groups

• Access to high quality genetic material and associated technologies
• Access to techniques and training to ensure successful growth and quality of material
• Access to credit
• Access to markets
• Promote diversified systems providing diverse livelihood opportunities
Rubber diversified systems
Teak plantation, Jepara, Indonesia

(photos Murdani Usman/CIFOR)
Conclusions

1) Expansion of plantations will continue

2) Sustainable development of plantations will require:
- The consideration of specific national and local situations
- The identification of priority issues locally and the combination of appropriate means and measures to address them. This process requires the involvement and coordination of all concerned actors (public, private, public private partnerships),
- Adequate incentives and support to actors for the implementation of solutions that are more adapted to the pursuit of multiple objectives.
The CGIAR Research Program on Forests, Trees and Agroforestry (FTA) is the world’s largest research for development program to enhance the role of forests, trees and agroforestry in sustainable development and food security and to address climate change. CIFOR leads FTA in partnership with Bioversity International, CATIE, CIRAD, ICRAF, INBAR and TBI.