



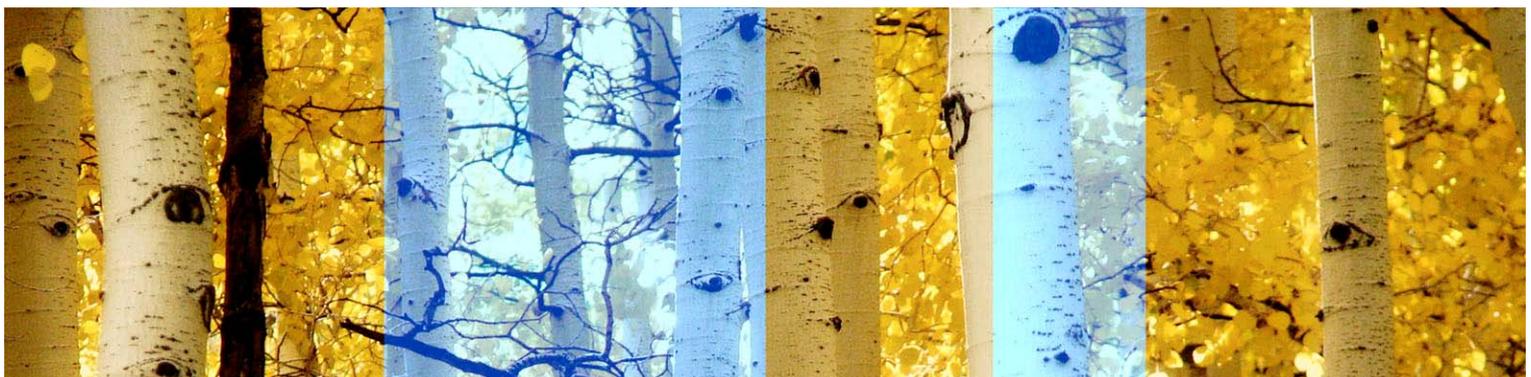
**Indufor** ...forest intelligence

Forest Stewardship Council (FSC)

## **Strategic Review on the Future of Forest Plantations**

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**Indufor**

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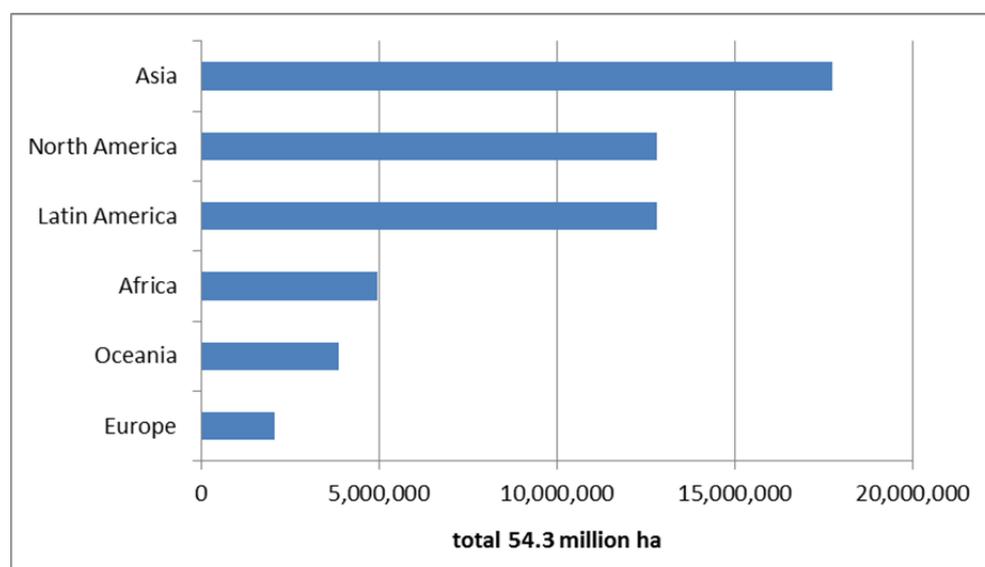
## KEY RESULTS AND SUMMARIZED FINDINGS

### Present Extent of the World's Fast-growing Industrial Forest Plantations

The world's total area of industrial fast-growing forest plantations<sup>1</sup> is 54.3 million ha (ha), based on Indufor's survey. The countries with the largest area of the plantations are the United States (US), China and Brazil, each having over 5 million ha of industrial plantations. India and Indonesia are the next largest plantation growers with over 2.5 million ha of industrial plantations.

Asia has the largest industrial forest plantations (17.7 million ha), followed by North America (12.8 million ha) and Latin America (12.8 million ha). In Africa there are almost 5 million ha, in Oceania 3.7 million ha and in Europe 2.0 million ha of industrial forest plantations.

**Figure 1 Industrial Forest Plantations by Region, 2012**



### Land Ownership

The majority of the world's forest plantations are still government-owned with 50% of the assets while corporates hold about 20% and private landowners about 30%. However, there are significant differences depending on the region.

Land is mainly owned by the state in Asian plantation countries (China, Indonesia, India and Malaysia) as well as in African plantation countries (Mozambique, Tanzania, Uganda, Rwanda, Zambia, Angola, Ghana and Liberia). The states have in some cases leased the land to private companies or other entities or allocated land to private farmers or villages with land titles that resemble freehold land.

In the US, Oceania and Europe the dominant land ownership mode is private freehold land. In the US and Oceania assets are mainly owned by corporates and in Europe by families or individuals.

The land ownership structure can be a barrier to entry for many plantation developers, although leasehold arrangements eliminate high upfront investment and speculation on land prices. All in all, it is expected that conventional state management will be

<sup>1</sup> The definition of industrial fast-growing plantations covers intensively managed productive plantations i.e. semi-natural planted forests, protection plantations and scattered planted woodlots are excluded.

replaced with outsourced private management and leasehold arrangements in the future in many countries.

In Latin America the pressure arising from the dissatisfaction of local smallholders, rural landless people and some civil society groups will undoubtedly impact on land ownership structure. While large-scale industrial ownership will remain dominant in the future there will be a growing number of small and medium-scale tree farmers. In some Asian and African countries small-scale tree growers are expected to play an important role in future plantation development.

### **Land Use Competition**

Global land use competition is mainly demand-driven due to increasing needs, on the one hand, of food and agricultural commodities, and bioenergy on the other.

The demand for arable land for food production is mainly driven by population growth and increased livestock production in developing regions, as well as by highly developed and populated countries suffering from shortages of farm land (e.g. South Korea, Qatar, United Arab Emirates). These countries have started to lease large areas of arable land, mainly from Africa, to grow food for their own citizens. The demand for bioenergy has not yet clearly materialised but it is likely that the decisions concerning renewable and bioenergy in Europe, the US and elsewhere will increase the competition for plantation land aimed at biomass production purposes.

Land use competition will put pressure on land prices, pushing them up and shifting forest plantations towards new frontiers. It will also be a strong future driver for more intensive management and for the development of technology aimed at higher productivity of trees and agricultural crops.

However, it is important to note that fast-growing forest plantations represent only 1.3% of the global forest area. It is anticipated that the share will grow to 2-4% by 2050. In other words, forest plantations as such are seldom the main form of land use even at the local level.

### **National Laws and Policies**

The key plantation countries have had and may continue to have incentive schemes supporting forest plantations. Such incentives include tax exemptions and direct or indirect plantation subsidies. Strong national policies promoting plantations have been seen in South America (Brazil, Chile and Uruguay), Asia (China and Vietnam) and Europe (the United Kingdom (UK), Spain and Portugal). There are very few incentives for plantation development in Africa – South Africa and recently Uganda are exceptions. In North America the state has traditionally neither limited nor supported forest plantation development.

Oceania, North America and Europe have well-established and enforced environmental legislation. In Latin American plantation countries environmental legislation and particularly law enforcement has recently tightened with strict permit processes and environmental liabilities. In practise this will guide plantation development and most likely lead to improved environmental performance. In many Asian and African countries insufficient law enforcement is, however, a serious problem.

### **Technology**

Oceania as well as Latin American and North American countries will continue to be the leaders in plantation technology with plant breeding, advanced silvicultural genetic



improvement, advanced silvicultural regimes and logistics. Plantation technology will also play an important role in adaptation to climate change.

The best available technology will, over time, spread to all global regions along with the international plantation companies and investors.

Genetically modified organisms (GMOs) are and will remain a contentious issue. However, most likely genetic modification will be applied in plantation forestry in the future to improve specific characteristics of planted trees.

### **Environmental Issues**

In countries and regions where the administration and society is strong enough to fulfil its role in legislation and law enforcement, the environmental issues are usually dealt with appropriately. Plantations can be part of rehabilitation of endemic forests and the growing wood source from plantations diminishes the pressure on native forests.

From a climatic point of view plantations can have both a positive as well as a negative impact. Plantations can be established for climate mitigation reasons as they can act as carbon sinks and store more carbon than, for instance, grasslands. On the other hand there is concern, mainly in Asia (Indonesia and Malaysia) regarding thick peat lands storing vast amounts of CO<sub>2</sub> as the draining of peat lands accelerates carbon emissions from soil.

Biotic and abiotic damage is a concern on existing monoculture plantations, as natural damage control is missing. In some areas the frequency of disease is higher in next generations of a plantation. More and more measures will be needed to mitigate such threats as wind, insects and fungi in changing climatic conditions.

Water shortage is a source of environmental concern in many regions. There is particularly a concern of plantation development with highly evaporating species will worsen the existing drought-proneness in vulnerable regions.

The environmental value of forest plantation depends largely upon the type and condition of the area replaced by a plantation. Inappropriate plantation expansion, with conversion of native vegetation to forest plantations and neglect of soil and water conservation, has given a bad reputation to forest plantations in some countries. Forest plantations, when properly managed, can, however, serve a number of purposes that reflect numerous societal values, including environmental ones.

### **Social Issues**

Plantation development naturally creates changes – both positive and negative – to the lives of local people. Social impacts are manifold and highly complex. In addition, they are dynamic, while being very time and place specific. In many regions the environmental and social issues are very much interlinked.

Population growth causes tension, mainly in Asia and Africa. As the population grows, more people will end up competing for the same piece of land, and as a consequence competition for land will become tougher.

The ambiguous situation regarding statutory and customary land use rights is another difficult issue in parts of Africa, Asia and South America. Indigenous people and other local communities often rely on customary rights, whereas plantation companies are committed to following the statutory licensing and tenure statutes. The statutory system does not always recognize or respect customary land rights, which can mean loss of land use rights for local people. In some countries the state does not allow plantation developers to take local people's wishes into consideration even if the



plantation company would like to do so. The situation creates a serious challenge for foreign companies working in developing countries– not least since sometimes plantation companies end up as stakeholders in local conflicts that were initiated long before they entered the area.

### **Timberland Investments**

The value of the global timberland area available for institutional investors is estimated to be USD600-700 billion, of which forest plantations have a significant share. The total value of the professionally managed timberland assets is USD70-100 billion<sup>2</sup>. This corresponds to only around one tenth of the value of global forestland available for investors worldwide, leaving major opportunities for institutional investors to access the asset class in the years to come. It is likely that timberland investments will grow in the future.

The majority of timberland investment funds are located in the US, with only a small share of the assets of the US funds being located outside the country (mainly in Australia, New Zealand and South America). More international focus has brought about new, non-US-based funds, especially in Europe. Currently, over 50 established timber funds exist globally.

In the future a shift of focus by investors from mature areas (North America, Oceania and parts of South America) to new regions and countries is expected. Investors are, in addition to the direct financial result, conscious of their reputation. As the global competition for arable land will most likely intensify, investors will tolerate higher risks and move to new, more demanding areas in the future. Investors from Asia, mainly China and India, are already active in the land markets in Africa and South America. Africa will become a more desired location and new areas will be explored in South America. Asia will continue to be an attractive target for investors, in spite of concerns regarding quite challenging land lease processes and concerns for environmental performance.

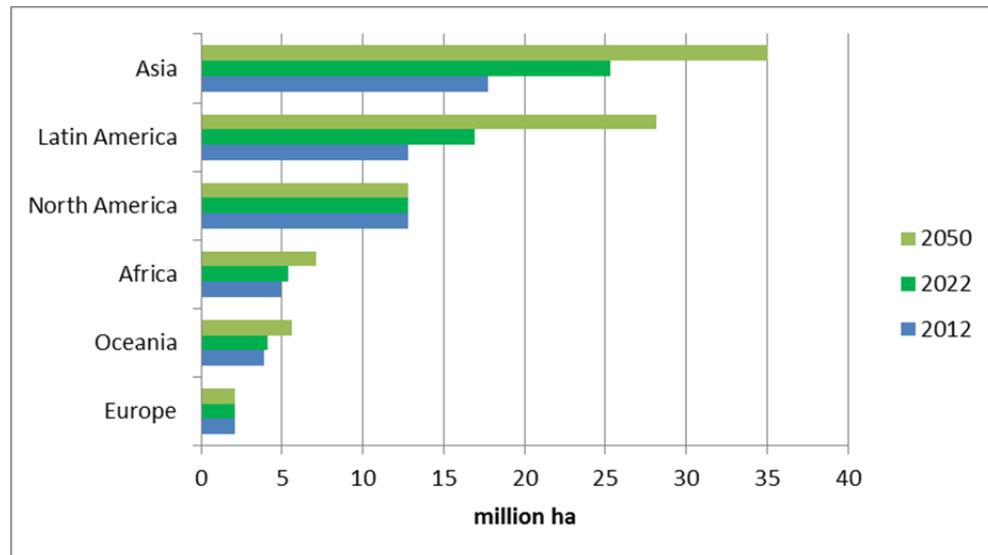
### **Global Plantation Supply Development**

Indufor estimates that the annual increase in forest plantation area from 2012 to 2022 is 2.28% and respectively from 2022 to 2050 it is 1.30%; i.e. the area will expand from the current 54 million ha up to 67 million ha in 2022 and finally up to 91 million ha in 2050.

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<sup>2</sup> Indufor estimate based on information of several Timberland Investment Management Organizations in 2012.

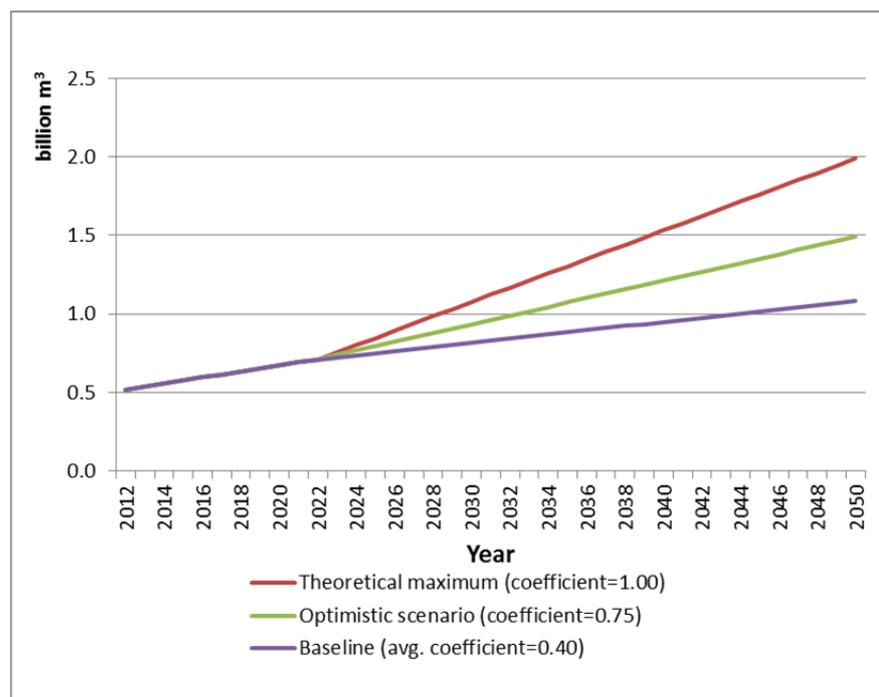
**Figure 2 Global Plantation Area in 2012 and Forecast for 2022 and 2050**



Source: Indufor Plantation Databank, 2012

The level of overall annual supply of plantation based roundwood is 520 million m<sup>3</sup> in 2012. Indufor estimates it will grow to 711 million m<sup>3</sup> by 2022. Under the baseline scenario the overall supply is estimated at 1 billion m<sup>3</sup> while the theoretical maximum scenario would imply an overall supply of 2 billion m<sup>3</sup> in 2050. Based on the optimistic scenario, and in Indufor's opinion the most likely scenario, the plantation wood supply will be 1.5 billion m<sup>3</sup> by 2050. The factors differentiating the supply scenarios are productivity, intensity of management and logistics.

**Figure 3 Global Plantation Supply Scenarios, 2012-2050**



Source: Indufor Plantation Databank, 2012

### Global Industrial Roundwood Demand

Global demand for industrial roundwood was just over 1.5 billion m<sup>3</sup> in 2012. North America, Europe and Asia are the largest demand regions, corresponding to 73% of global consumption.

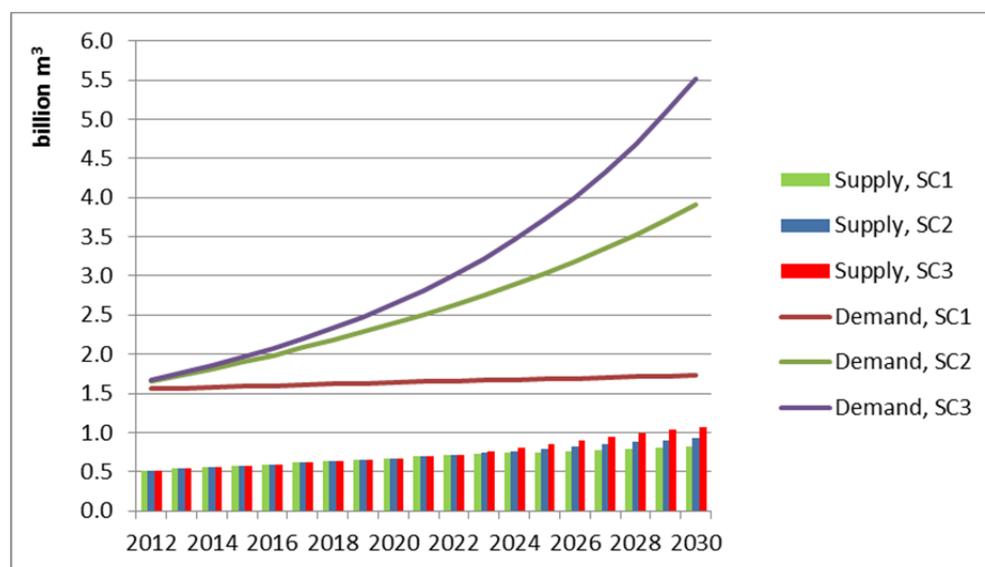
**Scenario I** of this study forecasts that globally the industrial roundwood demand will reach over 1.7 billion m<sup>3</sup> in 2030, and just under 2 billion m<sup>3</sup> in 2050. This trend reflects the expectation that the world population in coming decades will still increase but at a slower pace. **Scenario II** forecasts that demand for such roundwood will exceed the 2 billion m<sup>3</sup> mark by the beginning of the next decade and reach just over 6 billion m<sup>3</sup> in 2050. Under **Scenario III** demand will reach just over 3 billion m<sup>3</sup> in 2030 and over 8 billion m<sup>3</sup> in 2050.

### Supply Demand Balance

At present, plantation based wood satisfies about one third of the total global industrial roundwood demand although with significant regional differences. Indufor estimates that by 2050 plantation based wood will satisfy between 25 and 35% of the industrial wood requirements, depending on the development of supply and demand.

Demand for industrial roundwood is forecast to grow faster than supply of plantation wood under all other scenarios except the most pessimistic demand scenario. Currently the share of plantation wood of all demand is some 33% and the share will decrease under all other scenarios except the pessimistic demand scenario.

**Figure 4 Global Demand and Supply Scenarios, 2012-2030**

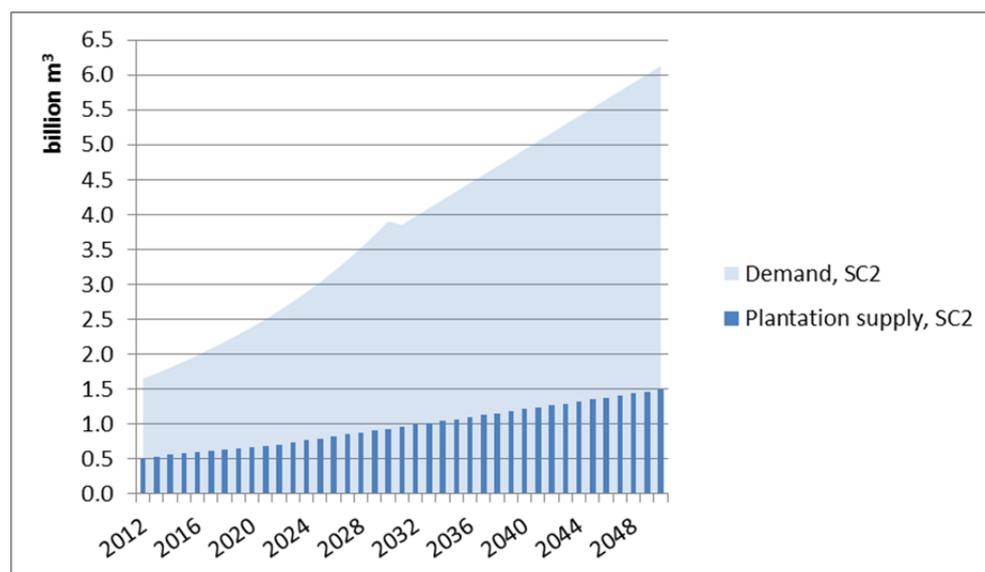


Source: Indufor Plantation Databank, 2012

Demand Scenario II is slightly optimistic and considered the most realistic outlook. Under this scenario supply of plantation wood cannot match the demand increase, and its share of all supply will decrease from 33% in 2012 to 24% in 2050. This means 76% of all global roundwood demand will be satisfied with harvesting from natural and semi-natural forests. This greatly increases the pressure on existing natural forests, both tropical and boreal. As the access to existing underutilized boreal forests is limited, the pressure will mount first on areas with easier access.

Only under supply Scenario III does the share of plantation wood of total supply remain stable at 32-34% towards 2050. This means plantation forestry is promoted, land tenure issues are actively resolved and land is made available for plantations, management is intensified, efficiency of wood production is improved and average growth, either through GMO or other effective means, is significantly increased. This would help to keep the utilization of natural forest at the current share, but in volume terms the use would increase substantially.

**Figure 5 Supply Scenario II and Demand Scenario II, 2012-2050**



Source: Indufor Plantation Databank, 2012

### Strategic Highlights of the Study

*Due to the forecast demographic and economic development Indufor anticipates that:*

- 1) Global fast-growing plantation area will most likely almost double by 2050.
- 2) Ownership and tenure structure of plantations will be more diversified, giving a more important stake in the future for: (i) financial investors, (ii) private small- and medium sized tree growers; (iii) lease arrangements between states and companies; and (iv) partnerships between strategic and financial investors as well as between companies and local landowners.
- 3) Land use competition will elevate land prices.
- 4) Growing industrial wood demand will continue most likely well beyond the volumes that the fast growing tree plantations can supply even if plantation development is accelerated.

*This means that the Forest Stewardship Standards (FSC) has to consider carefully the following environmental and social challenges:*

- 1) The pressure to use natural forests, particularly in frontier areas, will continue and cause deforestation and degradation.
- 2) Climate change increases risks related to wind, insects, drought, fire and other damage.
- 3) Incompatibility of statutory and customary law regarding land ownership, tenure and use will cause more tension at the local level in new frontier regions.
- 4) Due to the increased number of small-size tree growers in many regions technology, logistics and market access will require new innovations.

- 5) Genetically modified organisms (GMOs) applied in tree breeding will continue to be developed.

*The FSC should capitalize on the following opportunities:*

- 1) Fast growing forest plantations can be an attractive investment target for financial and strategic investors as well as for local landowners.
- 2) Plantation development can improve the overall environmental performance and increase ecosystem services related to biodiversity, carbon stocks and landscape planning.
- 3) Forest plantations that involve local stakeholders provide positive social impacts: improved land management, employment, income, infrastructure, and social services (e.g. education, health).
- 4) New innovations in plantation technology can increase future wood supply and adaptation to climate change.
- 5) National and local level policies can accelerate plantation development e.g. with direct and indirect incentives as well as by improving the operational environment.
- 6) Forest plantation development has an important role in climate change mitigation and adaptation: releasing pressure from tropical natural forests, increasing carbon stocks, and improving resistance to changing climatic conditions.

*Indufor recommends that FSC take into account the following issues in future strategic work:*

- 1) Plantations will be very significant for wood sourcing in the future and it is important that FSC have clear guidelines both for certification in plantations and in natural or semi-natural forests.
- 2) FSC has to remain abreast of the changing ownership of plantations and develop and diversify its approaches to reach different types of owners (institutional, timber investment management organizations (TIMOs), industrial, smallholders) of plantations.
- 3) FSC has to be active in new frontier areas e.g. in Africa where the area of forest plantations is expected to grow rapidly.
- 4) FSC has to develop a strategy regarding carbon issues and plantations to meet the expectations in the future and to be able to benefit from finance in carbon trading.
- 5) FSC should pay attention to the development of GMOs. As a first step FSC could develop a policy regarding research on GMOs. FSC could also formulate a policy promoting openness and the need for monitoring in relation to the use of GMOs.



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**Indufor Oy**  
Töölönkatu 11 A  
FI-00100 Helsinki  
Finland

Tel. +358 9 684 0110  
Fax +358 9 135 2552  
indufor@indufor.fi  
www.indufor.fi

**Indufor Asia Pacific Ltd** Tel. +64 9 281 4750  
7th Floor, 55 Shortland St Fax +64 9 281 4789  
PO Box 105 039 indufor@indufor.fi  
Auckland City 1143 www.indufor-ap.com  
New Zealand

