

Annex 1. Background to definitional issues

Currently, the international definitions of forests adopted by FAO on the advice of its member states identify “planted forests” as part of the spectrum of forest types (Figure A1). Under this definition, “tree plantations” as defined in this Background Paper are a subset of planted forests, corresponding to the “Productive Plantation” category of “Planted Forests”

Figure A1. FAO definitions of forest types

(Reproduced from Carle and Holmgren 2008 *Forest Products J* 58(12): 6-18, Figure 1; see also <http://www.fao.org/forestry/plantedforests/67504/en/>)

Figure 1. — Scope and concept of planted forests.

Continuum of Forest Characteristics						Non-forest
Primary	Modified natural	Semi-natural		Plantation		Trees outside forests
		Assisted natural regeneration	Planted	Productive	Protective	
Forest of native species, where there are no clearly visible indications of human activities and the ecological processes are not significantly disturbed	Forest of naturally regenerated native species where there are clearly visible indications of human activities	Silvicultural practices for intensive management (weeding, fertilizing, thinning, selective logging)	Forest of native species, established through planting, seeding or coppice of planted trees	Forest of introduced species and in some cases native species, established through planting or seeding mainly for <i>production of wood or non-wood goods</i>	Forest of native or introduced species, established through planting or seeding mainly for <i>provision of services</i>	Stands smaller than 0.5 ha; trees in agricultural land (agroforestry systems, home gardens, orchards); trees in urban environments; and scattered along roads and in landscapes
			← Planted Forests →			

Civil society organizations concerned with plantations have long argued that the definition of forests should be changed to differentiate ‘tree plantations’ from ‘forests’¹.

Participants in TFD’s IMPF2 Scoping Dialogue agreed the issue of definition should form part of the agenda for discussion in the Tree Plantations in the Landscape dialogue. FAO developed two Information Notes on Planted Forests for the 2015 World Forestry Congress; these are attached as background.

¹ e.g. Friends of the Earth (www.foei.org/wp-content/uploads/2014/01/plantaciones-final-ingles.pdf), World Rainforest Movement (<http://wrm.org.uy/browse-by-subject/tree-plantations/forest-definition/>)

Information note on planted forests for WFC 2015

FAO Forestry Department

26 August 2015

I. FAO's approach to the definition of forests

There are over 200 national definitions of forests, reflecting the diversity of countries' forest resource conditions, the viewpoints of their stakeholders, and perceptions of socially acceptable, economically viable and environmentally sound forest management. The international forestry community, guided by the Committee on Forestry (COFO), which consists of representatives of governments as well as observers from civil society, academia and other international organizations, agreed on a globally valid, simple, and operational definition of forests. The aim was to enable the reporting of reliable data to FAO's Global Forest Resources Assessment (FRA) at an international level and to promote understanding of global forest development and change.

The FRA uses standard global definitions for the various categories of forest, including planted forests, and presents data based on reports from sovereign governments, who report using definitions that are nationally relevant as well as those that are internationally harmonized to allow consistent comparisons across countries and over time.

Maintaining a broader definition of "forests" allows the World Forestry Congress to stay true to its purpose, which is "*to serve as a forum for the exchange of views and experience and for discussion of matters concerning all aspects of forestry which may lead to the formulation of broad recommendations applicable on a regional or world-wide basis*".²








II. Terminology and definitions applied by FAO

FAO, through the FRA, has been collecting data since 1980 on two main categories of forests: natural forests, and planted forests. In 2005, the FRA introduced two additional forest categories: modified natural forests, and semi-natural forests. Five major groupings of tree resources are now defined, based on the degree of human intervention, the silvicultural method of forest regeneration, and the location within or outside forest areas. The categories are: 1) primary forest; 2) naturally regenerated forest; 3) semi-natural forest, comprising natural and planted regeneration; 4) plantations, comprising productive and protective plantations; and 5) trees outside forests (see Figure 1). Productive and protective plantations, together with the planted component of semi-natural forests, constitute the subgroup "planted forests", as defined in FRA 2015.³

² CL 115/16, Procedure for Selecting Host Countries For the World Forestry Congress, Hundred and Fifteenth Session of the FAO Council, Rome, 23-28 November 1998

³ Planted forests are defined as forested areas of more than 0.5 ha with trees higher than 5 metres and a canopy cover of more than 10 per-cent. They are predominantly (more than 50 percent of growing stock) composed of trees of native or introduced species established through planting and/or deliberate seeding. They include coppice from trees that were originally planted or seeded, as well as rubberwood, cork oak and Christmas tree plantations.

Fig. 1: Scope and concept of natural and planted forests

Natural forest		Planted forest				(5) Trees outside forests
(1) Primary forests	(2) Naturally regenerated forests	(3) Semi-natural forests		(4) Plantations		
		Assisted natural regeneration through silvicultural practices such as:	Planted component	Productive	Protective	
						
Forest of native species, where there are no clearly visible indications of human activities and the ecological processes are not significantly disturbed	Forest of naturally regenerated native species where there are clearly visible indications of human activities	<ul style="list-style-type: none"> • Weeding • Fertilizing • Thinning • Selective logging 	Forest of primarily native species, established through planting, seeding or coppicing	Forest of primarily introduced and native species, established through planting or seeding, mainly for the production of wood or non-wood goods	Forest of native or introduced species, established through planting or seeding, mainly for the provision of environmental services	Stands smaller than 0.5 ha; tree cover in agricultural land (agroforestry systems, home gardens, orchards); trees in urban environments; and scattered along roads and in landscapes

Source: Carle and Holmgren, 2008, modified and illustrated.

III. Facts and figures on planted forests

1. Planted forests vary from strictly protected conservation forests (e.g. Mediterranean pine forests for slope stabilization) to highly productive, short-rotation plantations (e.g. *Eucalyptus* plantations for fibre production).
2. Planted forests are not inherently good or bad. At best, they help restore forest cover and functions, support rural livelihoods, help communities raise their standard of living, and contribute to sustainable development. At worst, poorly designed and managed planted forests can have serious environmental impacts and alienate people from their traditional lands.
3. Planted forests are a recognized type of land use that can produce a diverse range of wood, fibre, fuel and non-wood products for corporate and smallholder investors pursuing commercial or subsistence purposes. Planted forests can provide social and environmental services, including restoring degraded lands, combating desertification, protecting soil and water resources, sequestering and storing carbon, and providing recreational and landscape amenity. Planted forests can conserve genetic resources and provide shelter, shade and fodder for livestock. They can deliver valuable services to urban populations, particularly in arid zones, by mitigating sandstorms, preventing sand-drift and absorbing sewage water.

4. The responsible management of planted forests can reduce logging pressure on indigenous forests by helping meet wood demand, enabling the management of indigenous forests for protective and conservation purposes. Planted forests can complement REDD+ initiatives to reduce greenhouse gas emissions from deforestation and forest degradation in developing countries, particularly by enhancing carbon stocks. Planted forests are a major tool in the restoration and rehabilitation of unproductive or abandoned agricultural land, deforested grasslands, brushlands, scrublands and barren areas; tree-planting can help restore productivity to understocked or degraded semi-natural forests.
5. The area of planted forests is growing in most regions of the world. The latest information from FRA 2015 shows that, from 1990 to 2015, **total forest area decreased** from 4.28 billion ha to 3.99 billion ha, and global forest cover as a percentage of total land area dropped from 31.85 to 30.85%. On the other hand, the **area of planted forests increased** from 167.5 million to 277.9 million ha, or from 4% to 7% of the total forest area. This increase was most rapid in the temperate zone and regionally in East Asia (e.g. China), followed by Europe, North America, and Southern and Southeast Asia. In FRA 2010, the global planted forest area was estimated at 264 million hectares, of which three-quarters was grown for productive purposes (i.e. the production of wood, fibre, fuel or non-wood products) and one-quarter was grown for protective purposes (mainly the restoration of degraded lands, combating desertification and the protection of soil and water resources).⁴
6. FRA 2015 reports that the majority of planted forests comprise native species; about 19% of the total planted forest area comprises exotic or introduced species. Introduced species are dominant in Southern Hemisphere countries in South America, Oceania and Eastern and Southern Africa.
7. Planted forests can provide many of the social, environmental and economic functions that indigenous forests provide. They may constitute a viable land use on degraded forest lands, unprofitable or marginal agricultural lands, and other abandoned and idle lands. Planted forests can provide sustainable livelihoods, ensure food security and contribute to poverty alleviation. Industrial plantations, a subset of planted forests, are a legitimate and viable land-use option in certain contexts, in the same way as intensively managed livestock and agricultural crops are also legitimate economic pursuits for providing livelihoods and food security. It is worth noting in this context that if industrial plantations were not classified as forests, they would most likely be classified as agriculture, a form of land use that is generally subject to fewer social and environmental regulations than forests.
8. The application of appropriate policy and legal frameworks, environmental impact assessments and good management practices in the establishment, management, harvesting and use of planted forests contributes to maintaining environmental functions, reducing the risk of wildfires, controlling the outbreak of pests and diseases, and reducing the incidence and impacts of invasive species. The use of herbicides, pesticides, fungicides and fertilizers is only acceptable in accordance with legal stipulations and best practice standards tailored to the specific requirements of planted forests.
9. The impact of planted forests on the conservation of biodiversity depends largely on the condition of the land before the planted forest is established. The substitution of indigenous forests with planted forests must be avoided for a range of reasons, including because of the impact of clearing on biodiversity. In some situations, indigenous forests and planted forests will form part of a mosaic of land uses that, if managed in an integrated manner with other land uses, can achieve positive outcomes for biodiversity by increasing the connectivity

⁴ Note that the distinction of planted forests grown for productive and protective purposes was not made in FRA 2015.

between ecosystems. Planted forests can also increase the availability of habitat for wildlife, especially when comprising indigenous tree species.

10. In many countries, planted forests have become a substantial component of the productive forest resource. Although, globally, planted forests account for only 7% of the global forest area, they provide a considerable share of global industrial roundwood demand. An FAO study⁵ undertaken in 2014 estimated the production volume of **industrial roundwood originating from plantations** in 78 countries in 2012 at 562 million m³, equivalent to **33%** of the global production of industrial roundwood from all types of forests (1.683 billion m³).
11. In 2006 FAO published the “Voluntary Guidelines on Responsible Management of Planted Forests”⁶, which were developed through a consultative process and approved by FAO member countries. The Voluntary Guidelines establish the following 12 principles for the sound management of planted forests: 1) good governance; 2) integrated decision-making and multi-stakeholder approaches; 3) effective organizational capacity; 4) recognition of the value of goods and services; 5) enabling environment for investment; 6) recognition of the role of the market; 7) recognition of social and cultural values; 8) maintenance of social and cultural services; 9) maintenance and conservation of environmental services; 10) conservation of biological diversity; 11) maintenance of forest health and productivity; and 12) management of landscapes for social, economic and environmental benefits. The Voluntary Guidelines are available in four languages in hard copy, and in pdf format at www.fao.org/forestry/plantedforests/67508.
12. FAO strongly supports fair and equitable processes to resolve conflicts over forest and land tenure. Equitable tenure achieved through proper consultation and participation is fundamental to sustainable forest management, including in planted forests, and achieving food security for all. FAO’s Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security provide guidance on the recognition, respect and safeguarding of legitimate tenure rights for the benefit of all, with an emphasis on vulnerable and marginalized people. The practice of “land-grabbing”, which implies the acquiring of land without proper process, is contrary to FAO’s view of good governance with regard to land and forest tenure.

⁵ Jürgensen, C., Kollert, W., Lebedy, s A. 2014: *Assessment of industrial roundwood production from planted forests*. Planted Forests and Trees Working Paper Series, Working Paper FP/48/E. <http://www.fao.org/3/a-i3384e.pdf>

⁶ FAO Working Paper FP/37/E, 2006.

1. *FAO's approach to defining forests*

There are over 200 national definitions of forests that reflect the viewpoints of a variety of stakeholders and their perception of sustainable forest management. The international forestry community guided by the Committee on Forestry (COFO) reached an agreement to accept a globally valid, simple and operational definition for forests to facilitate the reporting of reliable data to FAO's Global Forest Resources Assessments (FRA). FRA uses these definitions for the different categories of forest, including planted forests, to allow consistent comparisons across countries and over longer periods of time on global forest development and change.

2. *Inclusion of forest plantations in the definition of forests*

Some civil society actors have campaigned for definitions of "forests" to exclude forest plantations. Under the guidance of its constituency, FAO uses standard global definitions for the different categories of forest. Planted forests are included with three subcategories: 1) productive plantations; 2) protective plantations and 3) the planted component of semi-natural forests. If plantations were not classified as forests, they would most likely be classified as agriculture, a form of land use that is generally subject to weaker social and environmental regulations than forests.

3. *The global significance of planted forests*

The area of planted forests continues to grow in most regions of the world. The latest information from FRA 2015 shows that from 1990 to 2015 **total forest area decreased** from 4.28 billion ha to 3.99 billion ha, and global forest cover dropped from 31.85 to 30.85%, while the **area of planted forests increased** from 167.5 to 277.9 million ha or from 4 to 7% of total forest area. This increase was most rapid in the temperate zone, and regionally in East Asia (e.g. China), followed by Europe, North America, and Southern and South East Asia.

4. *Native vs. exotic/introduced species*

FRA 2015 reports that the majority of planted forests comprise native species with only 18–19% of the total area comprising exotic or introduced species. Introduced species are dominant in the southern hemisphere countries of South America, Oceania and Eastern and Southern Africa, where industrial forestry is dominant.

5. *Economic significance of planted forests*

Planted forests can produce a diverse range of wood, fibre, fuel and non-wood products for use by local people, companies, smallholders and governments. In many countries planted forests have become a substantial component of the productive forest resources. Although, globally, they account for only 7 percent of the global forest area, they provide a considerable share of the global industrial roundwood demand. A comprehensive study undertaken in 2014 by FAO estimated the production volume of industrial roundwood originating from plantations at one third (33 percent) of the global production of industrial roundwood from all types of forests (1.683 billion m³).

6. Social and environmental significance of planted forests

Planted forests can provide social and environmental services, such as rehabilitating degraded lands, combating desertification, protecting soil and water resources, and providing recreation opportunities. Planted forests can be used to help conserve genetic resources, and to provide shelter, shade and fodder for livestock. Well-planned and implemented planted forests can deliver valuable services to urban populations, particularly in arid zones, by mitigating sandstorms, preventing sand-drift, and absorbing sewage water.

Planted forests can also play an important positive role in mitigating climate change by capturing carbon dioxide from the atmosphere and storing it in trees and wood products. Like any development, however, poorly conceived and managed planted forests could lead to increased greenhouse gas emissions. This might be the case, for example, if natural forests are cleared to make way for planted forests because of the emissions caused by the act of deforestation.

7. Planted forests and water

In planted forest management wrong species choice, particularly if using species with high water requirements, can deplete water resources, especially groundwater. This can have major impacts, often beyond the planted area. FAO advocates the use of indigenous species adapted to local soil and water conditions in preference to introduced species. Particular care should be taken in water-stressed and arid and semi-arid areas with little rainfall. The overuse of heavy equipment should be avoided because this causes soil compaction and impedes hydrology.

On the other hand, well-designed and well-managed planted forests can play a significant role in regulating water flows and improving water quality. They can be an important mechanism in rehabilitating catchments. As with naturally regenerating forests, they can regulate floods, reduce debris flows and stabilize land, thereby reducing soil erosion that would otherwise lead to excessive sedimentation in rivers and lakes. They can help control soil and water salinity and improve soil stability to prevent landslides. Well-managed planted forests can thus improve environmental sustainability and the goods and services provided by both land and water when integrated with other watershed management initiatives.

8. Planted forests and biodiversity

The impact of planted forests on biodiversity depends largely on the condition of the resource prior to the land being planted. Planted forests should never replace primary forests, ecologically significant secondary forests, or other important ecosystems with significant conservation value. However on degraded forest lands, unprofitable or marginal agricultural lands, shifting cultivation areas or other abandoned and idle lands, planted forests, may constitute a legitimate land-use option, similar to the way in which the intensive management of livestock and cash crops in agriculture, horticulture and aquaculture is a common land use for generating economic benefits, providing sustainable livelihoods, ensuring food security and alleviating poverty.

9. Planted forest and genetic engineering

Genetic modification technology is a relatively new tool in planted forest management. It has potential benefits and drawbacks, but it is not intrinsically good or bad. Each application of this technology to planted forests should be assessed, under stringent national regulatory conditions,

in order to identify potential risks. As with the products of conventional breeding, genetic modification may entail some risks of gene transfer to breeding populations of wild relatives of a species, potentially leading to hybridization or introgression and other environmental impacts. Validated and effective national and international regulations, strategies and guidelines, such as the Cartagena Protocol on Biosafety, are necessary for the evaluation of risks and impacts associated with genetic modifications in planted forests.

10. Planted forests and food security

The role of planted forests in food security and nutrition depends on the approach taken to the establishment and management of such forests. Planted forests can contribute to food security and nutrition by sustainably producing woodfuel, which can be used to prepare food, providing incomes for local people through planted-forest-based enterprises, producing edible non-wood forest products, and increase the productivity of agricultural lands through agroforestry arrangements, while also diversifying diets.

On the other hand, planted forests can increase food insecurity if, for example, they replace productive indigenous forests (which communities may rely on to provide food products and medicines), result in the displacement of local people, or reduce the water supply for agriculture.

The key to maximizing the potential of any given planted forest to food security and nutrition, and minimizing the risk that it will reduce food security, is to adhere to the 12 principles for the responsible management of planted forests (see next item).

11. FAO's Guidelines on Planted Forests

In 2006 FAO published the “Voluntary Guidelines on Responsible Management of Planted Forests”, which were developed through a consultative process and approved by FAO’s member countries. The Voluntary Guidelines establish 12 normative principles for the sound management of planted forests. They are available in four languages and can be downloaded from www.fao.org/forestry/plantedforests/67508/en.

In addition FAO has developed many other tools to assist in the appropriate planning and management of planted forests, and methodologies to ensure that all stakeholders are able to engage in the decision-making process on land-use decisions involving planted forests.

12. FAO's role in supporting planted forests development

FAO serves as a neutral forum for policy dialogue, as a reliable source of information on forests and trees, and as a provider of expert technical assistance and advice to help countries develop and implement effective national forest programs. FAO supports the Advisory Committee on Sustainable Forest-Based Industries, which is an association of forest industries experts. At the same time FAO assists small-scale producers to form producer organizations to increase their voice in policy development, advocate on their behalf, increase their access to markets, and provide professional services.