Supporting document for developing a draft Typology of Plantation

Include:

1. Definition of Plantation(s)
2. Classification of Plantation(s)
3. References
Definition of Plantation

FAO (1998) identifies Plantation as "forest stands established by planting and/or seedling in the process of afforestation or reforestation. They are either: of introduced species (all planted stands), or intensively managed stands of indigenous species, which meet all the following criteria: one or two species at planting, even age class, regular spacing"

FAO for the temperate and boreal forest component of Forest Resource Assessment 2000, the following specification (related to the intensity of management) has been added to the above definition: "Excludes: stands which were established as plantations but which have been without intensive management for a significant period of time. These should be considered semi-natural"

Sohngen et al (1997) describe Plantation as "accessible lands established as timber plantations. The lands are generally more productive than their regular counterparts"

The Victorian State Government define plantations as "a forest stand established by the planting or sowing of trees of either native or exotic species selected for their wood-producing properties and managed intensively for timber production"

Judy Clarke, from the Australian National University, and author of "Australia's Plantations" uses this definition: "trees planted and managed in an agricultural context for which wood production is the major objective"

Plantation can be considered to arise from any deliberate tree-planting activity, the meaning is restricted to perennial woody crops which may, under certain conditions (often linked with neglect or less intensive management!), provide some of the environmental benefits of natural forests. Further, although it is recognized that trees may be planted under a wide range of circumstances - as part of the agricultural landscape, for aesthetic pleasure or within the context of classical silviculture - and with a wide range of intended products - fuel, food, protection - the principal concern here is with industrial wood monocultures in the tropics (Sargent, 1992).

A commercial plantation is a cultivated area whose species and structure have been simplified dramatically to produce only a few goods, whether lumber, fuel, resin, oil, or fruit. A plantation's trees, unlike those of a forest, tend to be a small range of species and ages, and to require extensive and continuing human intervention (World Rainforest Movement, 1999).

FAO in Hakkila (1994) defined Plantations as a class of forest that is established artificially, either through afforestation on land that did not previously carry forest, or through reforestation on land which has carried forest within the last 50 years or within
living memory and involving the replacement of the previous forest cover by new and essentially different crop.

Plantation is a stand composed primarily of trees established by planting or artificial seeding -note1. a plantation may have tree or understorey components that have resulted from natural regeneration; -note 2. depending on management objectives, a plantation may be pure or mixed species, treated to have uniform or diverse structure and age classes, and have wildlife species commensurate with its stage of development and structure; -note 3. plantation may be grown on short rotations for biomass, energy, or fiber production, on rotations of varying length for timber production, or indefinitely for other values (Helms, 1998).

A paper for the Third Meeting of the Intergovernmental Panel on Forests of the Commission on Sustainable Development, 9-20 September 1996, Geneva - defined a plantation as the more-or-less intensive cultivation of trees, usually managed on agricultural principles. A "classic" plantation includes monocultural blocks of fast-growing species. Most of the world's timber plantations consist of a few species, such as Sitka spruce (Picea sitchensis) and radiata pine (Pinus radiata) in temperate countries and Acacia and Eucalyptus species in the tropics.

IPCC, 2000 defined Forest Estate as a forested landscape consisting of multiple stands of trees, while Forest Stand is defined as a community of trees, including aboveground and below-ground biomass and soils, sufficiently uniform in species composition, age, arrangement, and condition to be managed as a unit.

Plantation as cultivation, mainly of trees, for commercial timber exploitation, usually managed on agricultural principles, often intensively (Dudley, 1996).

Cadman defined plantation as treed areas lacking most of the principal characteristics and key elements of native ecosystems as defined by FSC-approved national and regional standards of forest stewardship, which result from the human activities of planting, sowing or intensive silvicultural treatments.

A plantation is defined as a forest crop or stand raised artificially, either sowing or planting (Ford-Robertson, 1971)

Plantation as a stand of trees established by human activity to meet predetermined social, environmental, or economic goals (Dunster and Dunster, 1996)

Plantation is taken to include the range of planting, from a single tree in a garden or farm, to the establishment of thousands of hectares on open grassland. In between, planting may include enrichment planting in an existing forest, the supplementing of failed natural regeneration, the planting of cover for game, or establishment of amenity trees in towns. In technical terms it refers to the process of afforestation, re-afforestation, or enrichment of existing forest using transplants raised from seeds, cuttings or tissue culture in the nursery (Adlard, 1993).
Oxford Dictionary (1995) defined plantation as an area planted with trees etc.

Pancel (1993) in Tropical Forestry Handbook written man-made forest, may defined as afforestation (forests established artificially on land that previously did not carry forest within the last 50 years) and reforestation (forest established artificially on land that carried forest within the previous 50 years, involving the replacement of the previous crop by a new and essentially different crop.

### Classification of Plantation

Pandey (1997) classified forest plantations into industrial plantations and non-industrial plantations. Plantation for the supply of roundwood for sawntimber, veneer and pulp have been classified as industrial plantations. Sometime they were identified from the source, but often the area had to be inferred on the basis of species composition. All other plantations are donated as non-industrial plantation and include those for fuelwood, soil and water protection and amenity purposes.

Sedjo (1997) categorised forest plantation and fiber farms into artificial regeneration. Generically the difference between intensively managed forest plantations and a fiber farm growing trees is perhaps artificial and, at best, one of degree. Some states and provinces make a distinction on the basis of the length of the growing rotation, e.g., a rotation of less then 10 years constitutes a fiber farm in Washington State and thereby receives a different and more favorable tax treatment. Also, the term fiber farm is often used when referring to very intensively managed tree plantations growing on lands that traditionally would be in agriculture. Finally, the industry appears to favor the term fiber farm since harvesting "farm" products is accepted as more politically correct than harvesting trees.

Sargent (1992) classified plantation into four elements of complexity, which related to landscape, species composition, management and ownership.

**Landscape**: Plantation should be planned to minimise impact on the landscape. This can be done by creating many individual homogenous planting units within the plantation, whose boundaries, roads and fire breaks should follow or reflect natural changes in vegetation, slope, soil type or drainage. Generally, boundaries should be buffered with native planting for conservation of the physical and biological environment. Where natural forest exists, this should be preserved.

**Multiple species**: The use of many species can increase profitability and social acceptability, by more effective use of the available space (vertically as well as land area) and by sharing the varied benefits. In certain Dipterocarp forest, for example, it has been shown that fruit trees are most common in the understorey, substantially avoiding competition for space with timber trees, and also providing valuable products for local people. More generally, mixtures of species with a broad genetic base provide insurance
against unpredicted events, although they are likely to be more difficult to manage than single-species plantations.

**Agroforestry management**: there are particular environmental, social and financial benefits to be gained from managing a plantation with an annual intercrop (agroforestry) system. These include:

- Continuous annual income for participating farmers
- Sharing of costs of plantation maintenance with agricultural enterprises
- Little, if any, reduction in wood volume production
- Intensified land use and productivity
- Synergistic effects of agricultural and tree crops (although some of these can be negative)
- Improved wildlife habitat
- Reduced risk of accidental or deliberate burning through:
  - Increased spacing
  - Reduced occurrence of grass-burning hazard
  - Increased responsibility of farmers with intercrops

**Land-holding**: A balance should be drawn between lands held by the plantation investor and those held by the rural population. On land held by the investor, planning and management can be optimized for environmental benefit. On land held by the rural population, social satisfaction is likely to be greatest.

FAO in Hakkila (1994) classifies forestry plantation according their functions as follows:

- Industrial plantations are established totally or partly for the production of wood for industry, mainly as sawlogs, plylogs, pulpwood and pitprops.
- Non-industrial plantations are established mainly for one or several of the following objectives: production of fuelwood or charcoal; production of small wood for domestic consumption; production of nonwood commodities; and soil protection.

Evans (1992) classified forest plantation into 3 forest types, where artificial regeneration is the basic criterion:

1. Afforestation of bare land where there has been no forest for at least 50 years. All afforestation of grasslands falls into this category and planting to stabilize sand-dunes, etc.
2. Reforestation of land which has carried forest within the last 50 years but where the previous crop is replaced by an essentially different one. An example is where rain forest is logged, cleared, and then part replanted with a single tree species and part left to natural regeneration as is being carried out in SW Sabah (Malaysia)
3. Reforestation of land which has carried forest within the last 50 years by renewal of essentially the same crop as before. This is much less common since one of the advantages of planting trees is the opportunity to introduce an new and more productive one. The *Araucaria* plantations around Bulolo in Papua New Guinea and some *Triplochiton* plantations in West Africa are examples of this forest type since the previous forest was often dominated by the same species as used in the plantations.
Pancel (1993) differentiated tree establishment activities into 4 technical systems:

- Large-scale industrial forestation, which is the maximum production of marketable products including fuelwood and general production for local and foreign demand
- Large-scale non-industrial protective forestation, which strives to protect resources, produce fuelwood and wood for general purposes and improve local living conditions
- Small-scale village forestation, which covers local demand for forest products and markets forest products for the benefit of small communities
- Agroforestry plantation, which covers the demand for forest products, additional income generation, equilibrated and sustained utilization of soil resources, complementary production and intensifies soil and water protection

References


The Victorian State Government (http://members.dcsi.net.au/kimjulie/definition.html)
