

Economic importance

- A. Locally used forests:** Local trees/forest provide for local needs with some occasional surplus for local exchange (fruit, fodder, firewood, timber, medicine)
- B. Community-based forest management:** Surplus production of trees (forests) with household utility value is common, access to viable market demand is limited
- C. Agroforests:** Surplus production is common and sale of tree products is (at times) a significant contribution to household income
- D. Tree plantations:** Trees are grown explicitly for markets of one-off 'destructive' products (such as timber, bark or roots for medicinal purposes) of limited household utility
- E. Tree crop plantations & horticulture:** Trees are grown explicitly for markets of repeatable 'non-destructive' products (such as resins, latex, fruits, tree seed) of limited household utility
- F. Advanced markets:** Access to markets is becoming limited due to consumer requirements - e.g. certification of tropical timber, quality requirement for foodstuffs & medicine, concerns over Genetically Modified Organisms (GMO's)

7. Tree and land tenure and policy issues

Rights to land may follow different dynamics than rights to trees, both in the local traditions and by national law. Often the rights to future benefits of a tree accrue to the (inheritants) of the planter. Trees derived from natural regeneration, even if they grow in between privately owned planted trees, may still be seen as public goods - as the example of durian trees in rubber agroforests in Sumatra shows. Trees can often be pawned.

8. SWOT of the AF technology

At the end of a RAFT, an analysis of strength, weakness, opportunities and threats (SWOT) will provide a good way to synthesize, jointly with local stakeholders.

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RAPID APPRAISAL OF AGROFORESTRY PRACTICES, SYSTEMS & TECHNOLOGY (RAFT)

Trees in Multi-Use Landscape in Southeast Asia (TUL-SEA)
A negotiation support toolbox for Integrated Natural Resource Management

Agroforestry systems and trees outside of forest

Agroforestry is an umbrella term for a wide range of practices and situations in which trees are allowed to grow or are grown on farms and in agriculturally used landscapes. Specific terms for specific forms of agroforestry are needed before we can understand the strengths and weaknesses of the use of woody perennials as providers of goods and services, and appreciate the opportunities for and threats to their further enhancement. The RAFT framework provides guidelines for the description and analysis of the ways trees are used and of use to rural livelihoods.

Objectives of RAFT

1. Provide clarity in terminology on agroforestry practices, systems and technology appropriate for local use and open to global comparisons,
2. Describes the relation between 'domestication' from perspectives of trees as biological resource, control over access to resources and knowledge/belief systems
3. Initiate more detailed data collection on input and output streams in various phases of the lifecycle of an agroforestry system
4. Appraise strength, weaknesses, opportunities and threats jointly with the main stakeholders to plan for applied research and development support.



Sugarpalm (*Arenga pinnata*)

Steps in RAFT

1. Terminology
2. Use of trees in space and time
3. Tree management and domestication
4. Local ecological knowledge and IPR (Intellectual Property Rights)
5. Component interactions
6. Input/output relations and profitability assessment
7. Tree and land tenure and policy issues
8. SWOT of the AF technology.



Sugarpalm (*Arenga pinnata*) Agroforest System in Batangtoru, North Sumatra, Indonesia

1. Terminology

a. Local identity and sensitivities around words such as 'forest'

The names for agroforestry technologies in any local, national or international language may refer to a dominant commodity, to the way it is managed and/or to a form of semi-managed woody vegetation (garden, forest). Translating the terms between languages is not easy, as the values embedded in the word may be lost or changed. Specific attention is needed where the word 'forest' implies control by the state. 'Community-based forest management' or 'agroforest' may refer to the same vegetation, but implies different political control. The sensitivities around terms need to be carefully explored with local informants of different backgrounds, including male and female respondents, farmers, landless peasants and government officials.



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b. National scale institutional earmarks on forest and trees outside of forest

An 'objective' descriptor such as the degree of crown cover by woody perennials may allow monitoring by remote sensing, but does not match current national policies or categories used in tracking 'deforestation' and 'forest degradation'. There is growing recognition for 'trees outside forest' as providers of goods and services, but such trees may still fall through the cracks of a 'forestry' versus 'agriculture' dichotomy.

c. International comparison in meta-land use systems

To ease global comparisons, the ASB Partnership for the tropical forest margins introduced a terminology of 'meta land uses' (van Noordwijk et al., 2001), as follows:

Main products	Land use system
Forest products	F _n Natural Forest, without extraction beyond the occasional harvest of non-timber forest products and/or hunting of wildlife
	F _m Managed Forests, with various degrees of harvest of timber and non-timber forest products and grazing, but no commercial logging
	F _l Logged Forests, with various intensities and timing of logging and degrees of management to enhance re-growth of valuable trees; can include 'enrichment planting' up to 1/3 of total tree basal area
Tree crops & timber plantations	T _e Extensive Agroforests : complex, multi strata agroforestry systems with at least 1/3 of tree basal area derived from spontaneously established trees and more than 5 recognized harvestable commodities
	T _m Intensive Agroforestry with at least two recognized harvestable commodities and less than 1/3 of tree basal area derived from spontaneously established trees
	T _s Simple, intensive tree crop systems or timber plantations with 1-2 harvested commodities
Annual crops	C _e Extensive crop / long fallow systems, with the cropping period less than 1/3 of the length of the intervening fallow (for the 'shifting cultivation' subset this may be less than 1/6)
	C _m Medium intensity, Crop / short fallow systems, with the cropping period up to twice the length of the intervening fallow
	C _i Intensive, crop / short fallow systems, with fallow periods less than half of the cropping period
	C _n Continuous annual cropping systems, which occasionally may skip a growing season as 'fallow'
Animal products	A _e Pasture / Grasslands / Rangeland based on spontaneously established vegetation but subject to various degrees of management
	A _i Intensive Pasture with farmer control over the composition and growth of the vegetation and various levels of drainage, fertilizer use and seeding of desired species

d. International agroforestry terminology

"Present classification schemes confuse agroforestry practices, where trees are intimately associated with agricultural components at a field scale, with the whole farm and forest systems of which they form a part." (Sinclair, 1999). "In fact, it is common for farming systems to involve the integration of several reasonably discrete agroforestry practices, on different types of land. The purpose of a general classification is to identify different types of agroforestry and to group those that are similar, thereby facilitating communication and the organized storage of information.

2. Use of trees in space and time

Topics to explore:

- Key concepts for analysis of rotational and internal regeneration systems
- Key concepts for analysis of spatial configuration of trees
- Landscape niche where the system fits
- Response to climate variation, seasonality, fire, drought years
- Ethnobotany and ethnozoology: how and what do local people know about plants and animals.

3. Tree management and domestication

Survey of trees in the system:

Origin: spontaneous growth in situ, transplanted from wilding, derived from nursery with local/external seed source, grafted with local/external budwood;

Ownership: use rights for fruits, falling branches and other non-destructive plant parts, use rights for timber, bark or other destructive harvest products;

Use for local consumption and use, for marketed products, as provider of specified environmental services (incl. slope stabilization, provider of mulch, N₂ fixation)

Compare results with thresholds in tree domestication (open access use, regulated use, managed regeneration, planted, selective propagation, breeding) stepwise change in technology, resource control and knowledge/beliefs.

Wiersum (1997) identified three thresholds in the process of domestication: 'controlled utilization' (the separation of open-access from a controlled harvesting regime); 'purposeful regeneration' (the separation of dependence on natural regeneration from interventions that generally require control over subsequent utilization) and 'domestication' (a movement toward a horticultural or plantation style production system).

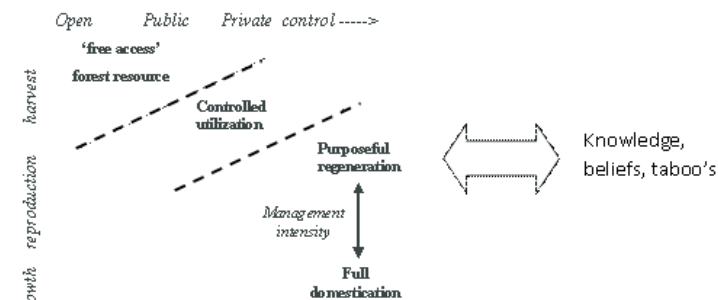


Figure 1. Stages in the 'domestication' of forest resources, on the basis on the various types of control (tenure) exerted the land and on the type of control exerted over the reproduction and growth of the plants involved (modified from Wiersum, 1997)

4. Local ecological knowledge and IPR (Intellectual Property Rights)

List of topics to explore:

- Ethnobotany: the components of the local system, their properties and potential use
- Explanatory ecological knowledge of relationships
- Management practices, skills and technology
- Socio-cultural value of trees and tree products.

5. Component interactions

Issues to explore:

Interactions between target trees and other system components: other trees, weeds, crops, domestic animals, pests, diseases, pollinators, seed dispersal agents.

6. Input/ output relations and profitability assessment

Issues to explore:

- System phase (year T₀ - T₁, T₁ - T₂, etc)
- Input (type, volume, current price), Labour, Land rents
- Output (harvested products, volume, current price)
- As basis for PAM (Policy Analysis Matrix) of profitability analysis.

Classification systems for land, animals, plants and markets

Land	Open access (de facto)	L1
	Community controlled land and resources	L2
	Community controlled land, private resources	L3
	Private control	L4
Plant resources	Propagule source: 'natural'	P1
	Propagule source: locally selected	P2
	Propagule source: externally obtained	P3
	Propagule source: externally 'improved'	P4
	Growth: reducing competitors	G1
	Growth: Securing symbionts	G2
	Growth: fertilizer	G3
	Growth: irrigation	G4
	Growth: drainage	G5
	Flowering induced	R1
	Pollination & fruit set stimulated	R2
	Protection from frugivores	R3
Animal resources	Advanced harvest techniques	H1
	Post-harvest processing	H2
	Harvest from wild, managed wild populations, domesticated stock with uncontrolled/controlled mating, specific selection of parentage ; roaming free, controlled range, stall-fed	A
Market	Local use within village	M1
	Use (buyers) within district/province	M2
	Use (buyers) at national scale	M3
	Regional markets	M4
	International markets	M5