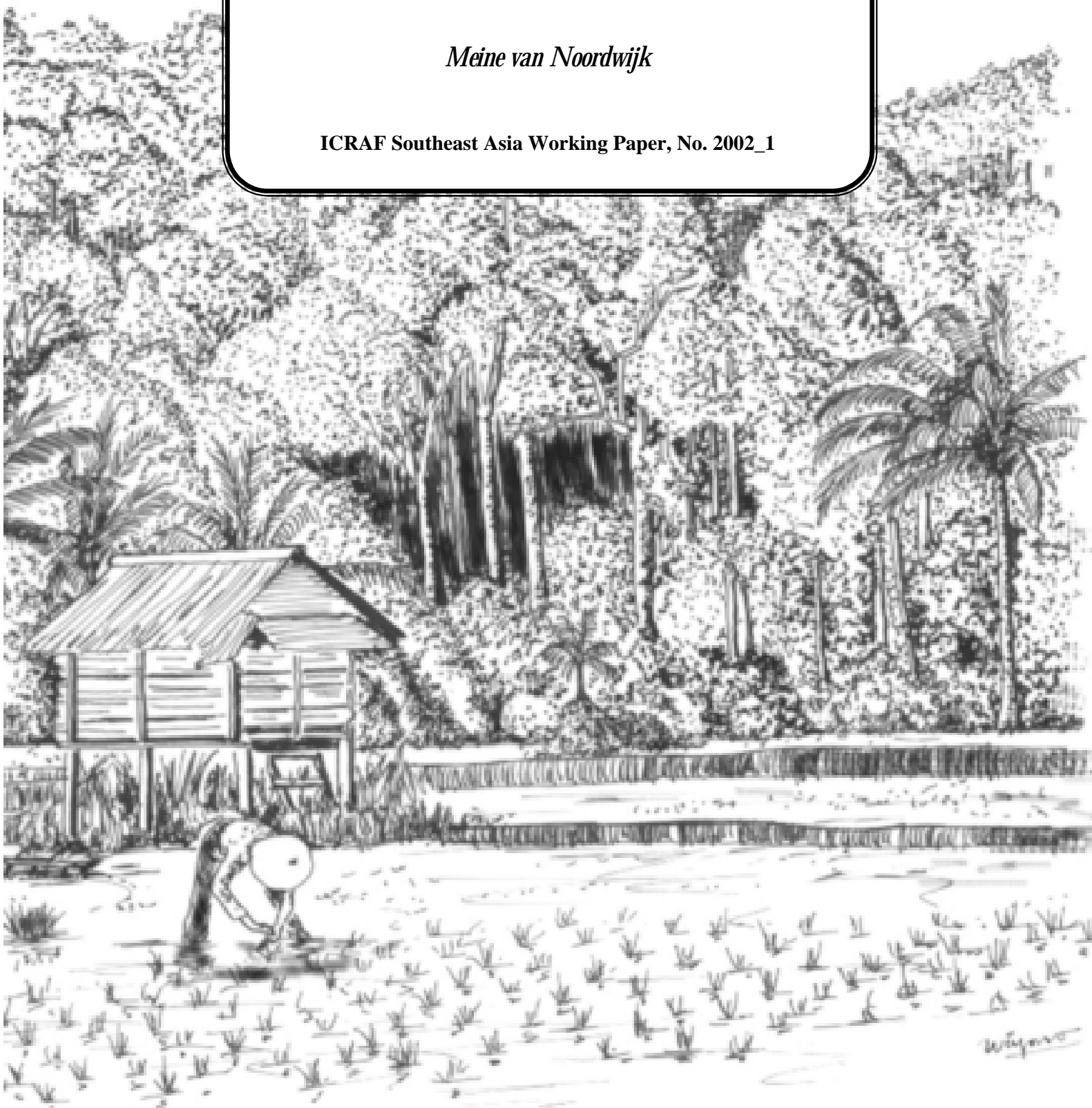**ICRAF, the World Agroforestry Centre –
who we are in Southeast Asia,
what we do, where and why**

Meine van Noordwijk

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Disclaimer

This text is a 'working paper' reflecting research results obtained in the framework of ICRAF Southeast Asia project. Full responsibility for the contents remains with the authors.

World Agroforestry Centre
TRANSFORMING LIVES AND LANDSCAPES

ICRAF, the World Agroforestry Centre – who we are in Southeast Asia, what we do, where and why

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G = Governance processes
- Land use rights
- Rewards for environmental services

- Capacity building for integrated natural resource management

L = Multifunctional landscapes

- Watershed functions, Biodiversity

- Dynamics of land use change

- Community institutions & social capital

F = Farmers' Land Management
- Plot-level technologies
- Household decisions & extension
- Tradeoffs

T = Trees & Markets
- Tree options
- Planting material
- Markets

ICRAF SEA Themes

The 'big 5' issues for Global Environment & Development
(Rio de Janeiro 1992 -Johannesburg 2002)
  ➤ Water
  ➤ Energy
  ➤ Health
  ➤ Agriculture
  ➤ Biodiversity

Can the World Agroforestry Centre
TRANSFORMING LIVES AND LANDSCAPES
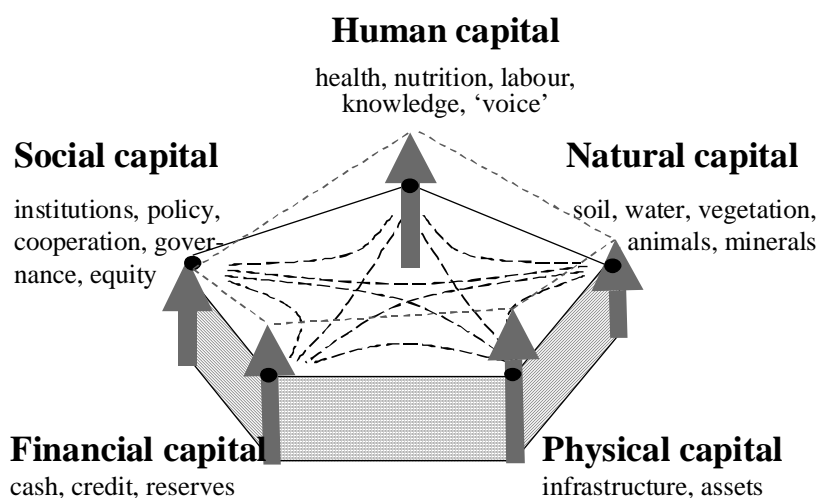help you to solve (part of) these issues?

1. Addressing the many dimensions of rural poverty in Southeast Asia

ICRAF, the World Agroforestry Centre, as part of the CGIAR or 'Future Harvest' family of international institutes, aims to contribute to some of the most pressing problems of this time:

- Three quarters of the world's poorest people - the 1.2 billion who live on less than one dollar a day - live in rural areas, and depend on agriculture, one way or another. The world has set itself the Millenium Development Goals of 50% poverty reduction from 2000 levels by 2015 as a first step....
- Rural poverty and poor health are causally related, with dependence on traditional medicinal plants, surface water resources and local agrodiversity as basis of healthy diets is at risk during the process of intensification of agriculture and potential benefits of globalization are not yet in reach for a majority of rural poor
- Water supply and conflicts over use of water and (forest) lands: while the water supply remains constant at best, the demands are increasing and so are the conflicts over water use
- Biodiversity conservation has to be made compatible with local livelihoods: the rain forest challenge is to protect key resources while allowing rural poor to improve their livelihoods
- Lack of social capital and the ability to resolve resource use and other conflicts leads to enormous opportunities lost for sustainable development
- While there is healthy market demand for many products that local agroforestry systems can produce, access to markets is often restricted by rules and taxes, lack of transport and information gaps, limiting the profitability of the use of local agrobiodiversity
- Government structures and processes tend to be biased towards urban perceptions and needs, and may favour development interventions that do not address the needs of the rural poor.

These issues refer to a lack of human, social, natural, financial and infrastructural capital. While all types of capital are needed for 'sustainable livelihoods' and solutions need to consider all, situations differ in the type of capital that is shortest in supply....

Poverty: critical lack of any of the five types of capital

Human capital
health, nutrition, labour,
knowledge, 'voice'

Social capital
institutions, policy,
cooperation, gover-
nance, equity

Natural capital
soil, water, vegetation,
animals, minerals

Financial capital
cash, credit, reserves

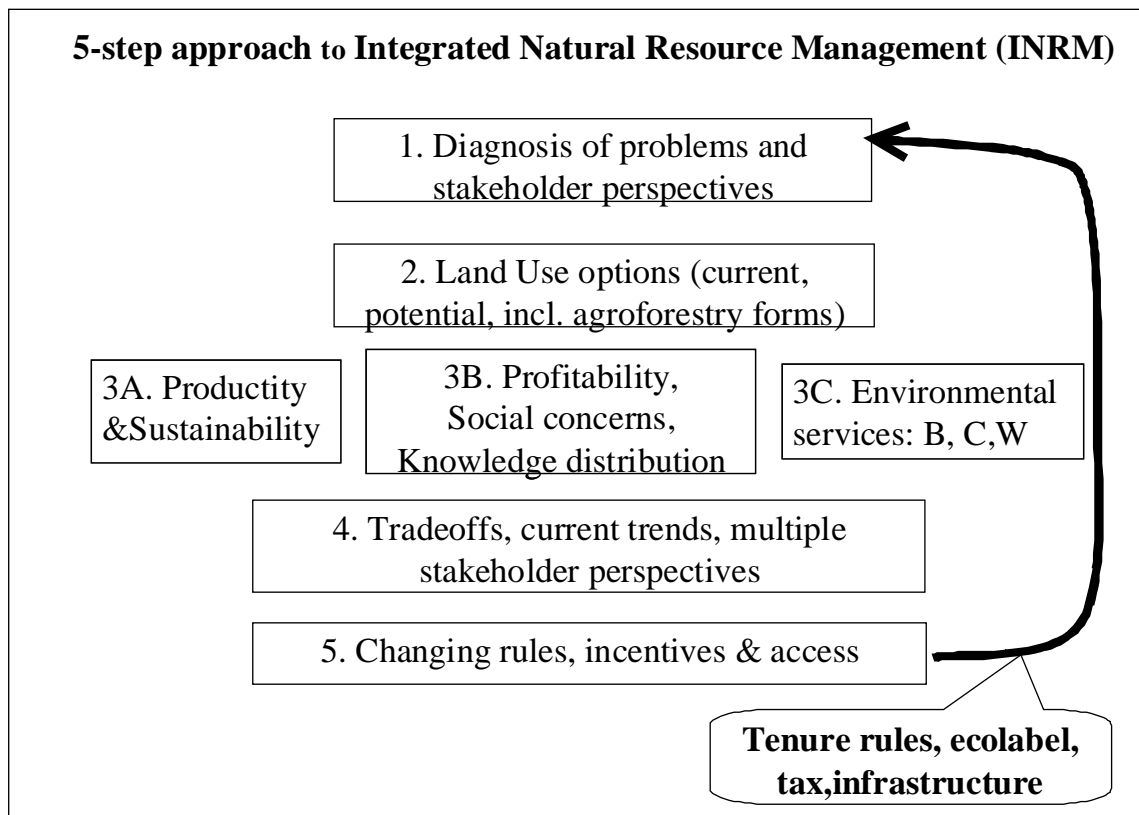**Physical capital**
infrastructure, assets

The 'convertibility' of the different types of capital is subject to debate – it is certainly not an automatic process, and the 'art' of development is to maintain a balance between all aspects while increasing overall wealth. Because of the incomplete 'convertibility', we have to realize that rural poverty has many 'faces': *lack of food*, *lack of income*, *lack of voice and recognition*, *lack of human capital due to lack access to public services* (education, health a.o.), *lack of access to environmental services* (clean water, clean air, nature a.o.).

The overarching 'hypothesis' that forms the basis for all our work is:

> *Agroforestry, in a broad sense of incorporating trees into agricultural landscapes, can contribute to the location-specific solutions for poverty, by increasing and stabilizing food production, by providing income security and allowing asset building, and by securing environmental services in productive landscapes.*

While nearly all farmers or rural people of the world are agroforesters, in the sense that they make use of trees as part of their livelihood strategies, their capacity to do so effectively can be supported by a Knowledge-based institution such as ICRAF that remains committed to public domain knowledge that is treated as international public good, and thus protected from individual intellectual property rights that are used extractively….

5-step approach to Integrated Natural Resource Management (INRM)

1. Diagnosis of problems and stakeholder perspectives

2. Land Use options (current, potential, incl. agroforestry forms)

3A. Productity &Sustainability

3B. Profitability, Social concerns, Knowledge distribution

3C. Environmental services: B, C,W

4. Tradeoffs, current trends, multiple stakeholder perspectives

5. Changing rules, incentives & access

Tenure rules, ecolabel, tax,infrastructure

Central to the way agroforestry can realize its potential to improve rural livelihoods (reducing poverty) as well as improve the environment, are the decisions that farmers or households make on how to *use* and *care for* the land-based resources. Their decisions to adopt, adapt, reject or innovate agroforestry is in the end what matters most. To influence these decisions positively, and remove existing bottlenecks and constraints, a number of aspects may have to change:
- a more conducive social context, access to land and other production resources and ways to resolve local resource use conflicts
- access to healthy markets, as it depends on infrastructure, local institutions and macro policies as well as up to date information
- general knowledge, understanding of options and the ability to learn and acquire new knowledge
- information on specific technologies and how to get the inputs (including quality tree germplasm) required

As the constraints may derive from different aspects under different circumstances, we support research and education (capacity building) systems, as well as institutional change and policy reform. Of specific interest are the possible incentives and rewards that may derive from the maintenance and increase of environmental service functions. Providing new institutional pathways for the beneficiaries of such services to provide rewards (of various types) is the target of the RUPES (Rewarding Upland Poor for the Environmental Services they provide) program.

ICRAF ('the world agroforestry centre') aims to

> **"conduct innovative research and development on agroforestry, streng-then the capacity of our partners, enhance worldwide recognition of the human and environmental benefits of agroforestry, and provide scientific leadership in the field of integrated natural resource management"**

Our objectives in Southeast Asia are:
- To develop a more systematic understanding of *the role of trees* in *land use mosaics* in Southeast Asia, and articulate the implications of this knowledge for the *sustainable management of natural resources* in upland watersheds
- To redress policy imbalances by providing *policy options* that will reduce poverty and conserve natural resources, facilitating their use in policymaking processes
- To facilitate effective and transparent mechanisms for *rewarding upland poor farmers* for the *environmental services* they provide through their land use practices
- To *develop the capacity* of our agroforestry research and development partners to address the most urgent natural resource management problems in the uplands
- To provide methods, tools, and analyses that lead to *institutional innovations* for successful participatory management of natural resource
- To identify and refine key *agroforestry technical innovations* that lead to more profitable and sustainable use of upland landscapes
- To facilitate the *impact of agroforestry innovations* on the land via the decisions of the millions of practical agroforesters, through strong linkages with development projects that employ recent research outputs.

2. Four nested themes shape our research-development-education activities

We can identify four pathways for reducing rural poverty, linked to different tyopes of 'capital':

1. Working trees with access to healthy markets – to allow natural + human + infrastructural capital to generate financial capital (income and assets)
2. Healthy farms and better land use and care – human + natural capital combine to allow for sustainable production of trees, crops and animals, while maintaining the production resources
3. Diverse landscapes serving multiple needs – social, natural, human and infrastructural capital combine to provide 'environmental services' such as usable water, clean air, and maintain biota that are directly useful or represent indirect value
4. Good governance and less conflict – human and social capital are needed to create, maintain and adapt rules and feedback mechanisms that balance individual freedom and the need for current and future generations to manage natural resources

Against the background of the faces of rural poverty in Southeast Asia and in a context of globalization of expectations and markets, decentralization and local protectionism (and the obvious contradictions between these processes), climate change and the need for continued adaptation, ICRAF – SEA is working on four different levels or scales:

1. **Governance processes:** policies and rules for access to and sustainable management of forests and land set the boundary conditions for agroforestry; mechanisms are needed that link demand and supply of environmental service functions through land use, especially in 'upland' settings; truly integrated natural resource management still requires a strong emphasis in capacity building. *These three examples may clarify that 'governance' is interpreted here as including multiple levels of government structures as well as 'civil society'.*

2. **Multifunctional landscapes:** interactions between patches of land and farms that form a landscape determine a 'landscape' and much of its functionality for productive as well as environmental service functions; the dynamics of landscapes often derives from multiple actors and impacts on stakeholders outside of then landscape; support for the process of negotiation between multiple stakeholders at the landscape scale forms a bridge between governance processes that set the boundary conditions and the activities of farm households and others that determine the dynamics. *Our agroforestry concept thus clearly includes that of mosaic 'landscape agroforestry' made up of both agricultural and forest 'plot' components, and our research includes investigation of spatial strategies for their relative distribution and placement in 'local' landscapes, as well as management approaches and monitoring of their overall impacts on provision of environmental services.*

3. **Farmers' land management:** plot or field level technologies are the basis of the productive use of landscapes by farming households, and knowledge that clarifies the consequences of the main options for land management with or without trees is still a critical requirement for all farmers while past research efforts have been biased towards 'packaged' technologies; household level decisions on adoption or non-adoption of agroforestry technologies for specific parts of their farm are often still poorly understood, and thus much of current 'extension' efforts are ineffective and inefficient; in any use of productive resources there are trade-offs between short-term profitability ('use', 'harvest'), long-term productivity ('plant', 'care for') and the 'production' of environmental service functions at the farm level - recognition of such tradeoffs in relation to the land, labour and financial capital resource base of a farm has to form the basis for any 'environmental service rewards'.
    Our notion of 'farms' and 'farmers' is a broad one that includes farmers with farms that are more or less exclusively owned (at least de facto) and operated by households, but also household field crop 'plots' within rotational forest fallow systems that are allocated (and reallocated) and at least partially managed within a broader community framework. Moreover, in all areas where activities like 'community forestry' are being recognized and/or promoted, households also engage in production and/or conservation activities on 'plots' of village common lands through community organizational arrangements.

4. **Trees and markets:** information on the menu of choice of globally existing and local tree diversity is still a basis for any farmers' decision to plant, manage or harvest trees; access to quality planting material remains a major constraint for farmers who want to make more use of trees on their farm and in their landscapes; the security of market access as well as the price for tree products derived from agroforestry is often limited by rules and the uncertainty over the way such rules change, linked to consumers and their quality concerns, while smallholder producers have little actual information.
    We work on a wide range of trees, including highly-domesticated trees grown using 'agricultural' practices, as well as trees that grow within 'forest' or 'forest-like' communities within broader 'agroforestry landscapes', all of which can be managed in a variety of ways to produce a variety of products.

These four themes (with 'trees, farms, landscape & governance' as shorthand names and T, F, L and G as abbreviations) are the focal points of our work – they are 'nested' (see front cover). We need a tight interaction between all four levels (and open 'walls' around the themes) to achieve our overall goal. These four pathways to potentially achieve 'impact' have led us to formulate 'themes' are based on four 'nested' system levels: trees, farms, landscapes, governance systems.
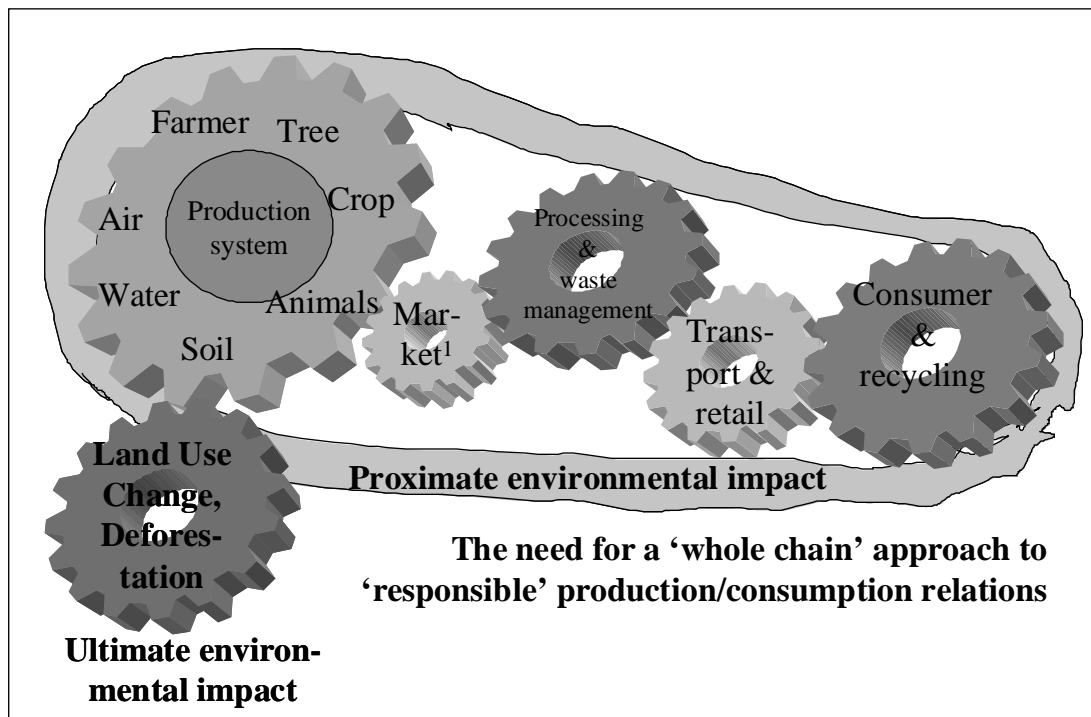
Trees and markets

This system level reflects the 'commodity approach' of the first decade of CGIAR institutes, but still forms the backbone of our agroforestree identity. We address questions at the levels of 'components', 'interactions' and 'system properties':

components: what choice of agroforestry trees (local, exotic, current, 'improved') does a farmer have, and what properties do these trees have?

interactions: how do farmers get hold of quality germplasm? How can this be improved?

emergent properties: how does the 'vertical integration' in the whole marker chain feed back on farmer options and decisions?
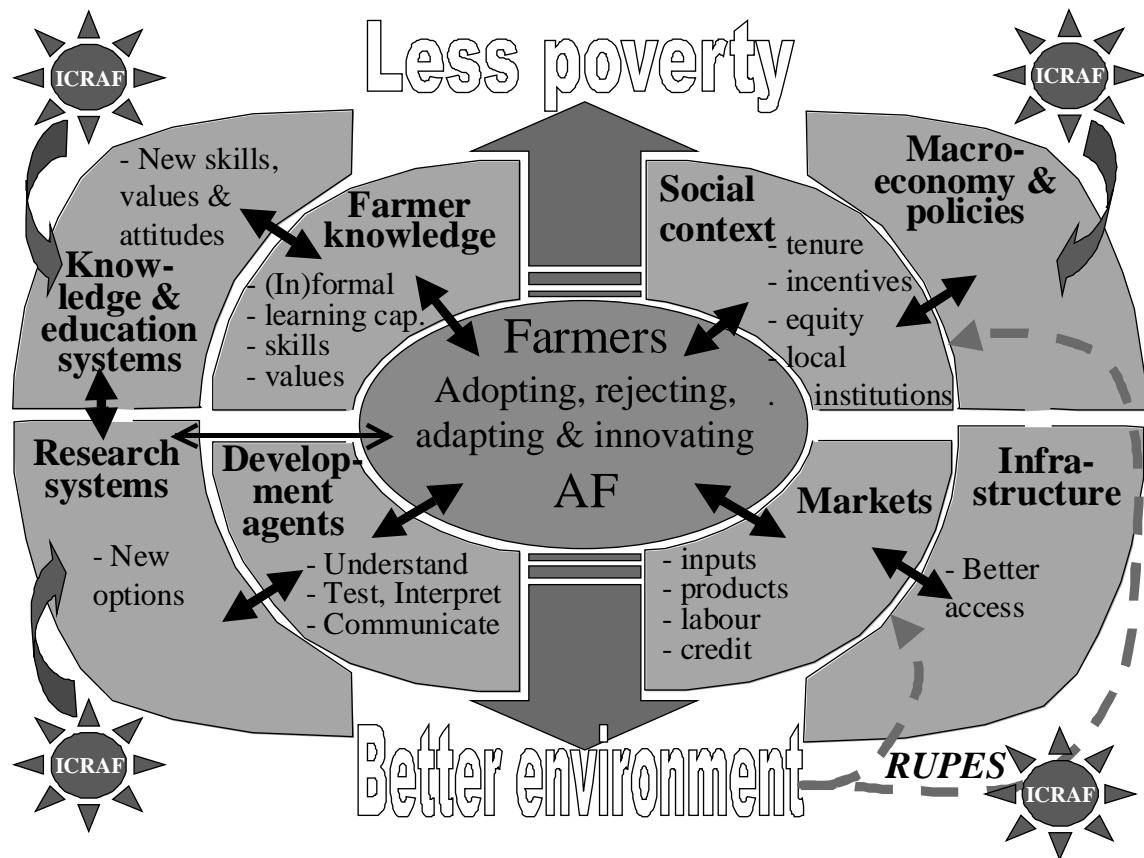

Farmer land management

This system level represents the second stage of CGIAR evolution, with a focus on 'technical options' (often called 'technologies...') and 'farming systems', putting the 'farmer first', it represents a definition of agroforestry on the basis of component interactions and complementarities in farm-level resource use. We address questions at the levels of 'components', 'interactions' and 'system properties':

components: what plot-level technologies are available for farmers to use, and what input-output relations can he/she expect these to have under a given set of circumstances?

interactions: how do farm households decide on their resource allocations in land management and how can these decisions be modified by increased access to knowledge products?

7

emergent properties: what are the consequences of current and potential future farmer land management decisions on food sufficiency, profitability, sustainability of production systems and external environmental impacts?
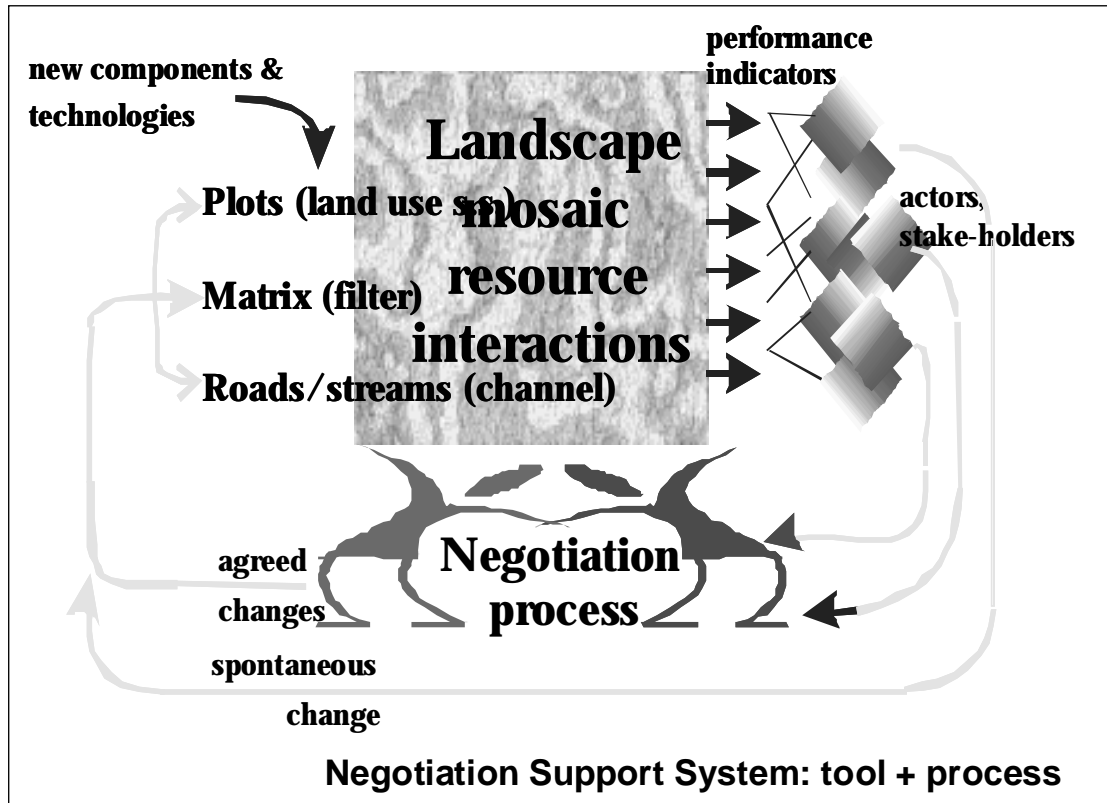

Multifunctional landscapes

This system level has emerged over the last decade as the basis for INRM and interaction between multiple stakeholders, both in terms of 'conflicts' that need to be resolved and in terms of potential positive rewards; agroforestry can be part of the problem as well as part of the solution at this scale, but we need a broader set of skills and partners than for the 'tree' and 'farmer land management' level to effectively contribute. INRM at this scale requires effective cooperation between CG centres that are associated with different parts of the land use spectrum. We again address questions at the levels of 'components', 'interactions' and 'system properties':

components: how do 'environmental service functions' (including watershed functions and biodiversity conservation) arise in landscape mosaics that include 'agroforestry farms' as well as a mix of protected areas, forest, intensive agriculture and/or (peri)urban land use?

interactions: how do land use mosaics change over time under the influence of human 'drivers', and what does this mean for local land use stakeholders as well as external beneficiaries of 'environmental service functions'?

emergent properties: how can local communities build and use 'social capital' to interact among themselves, reduce conflicts and negotiate with external government or non-government agents to increase the multifunctionality of landscapes

new components & technologies

Landscape mosaic resource interactions

Plots (land use ss)

Matrix (filter)

Roads/streams (channel)

performance indicators

actors, stake-holders

Negotiation process

agreed changes

spontaneous change

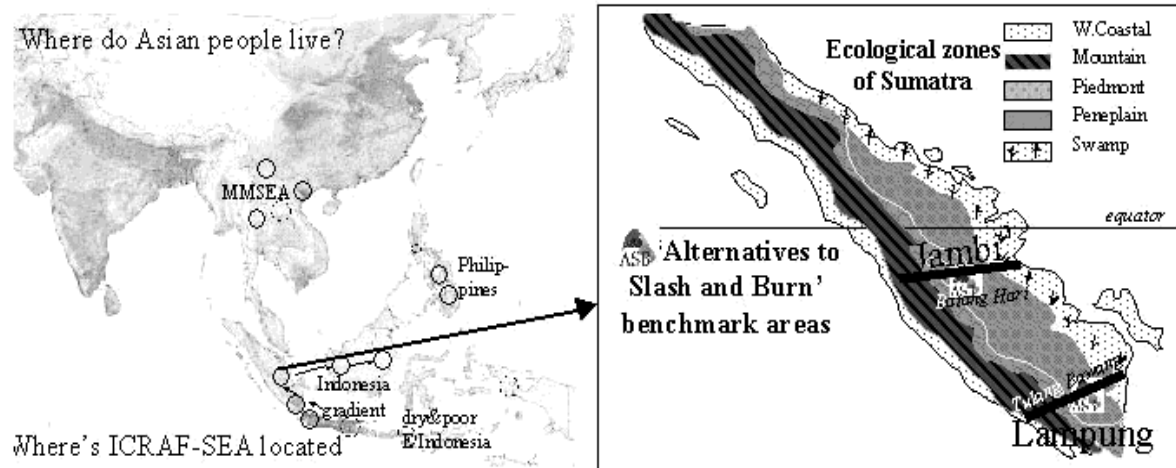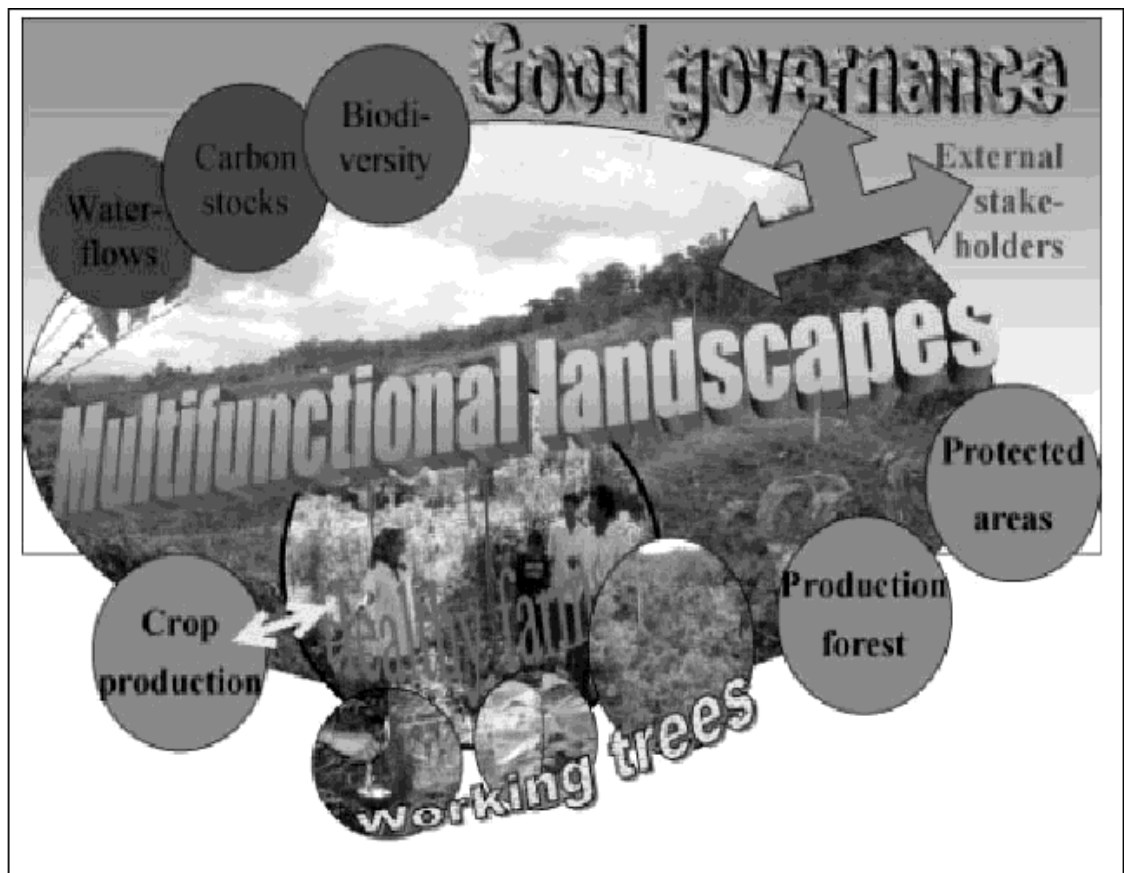**Negotiation Support System: tool + process**

Governance processes

This system level can easily dominate all others, and can not be ignored for any real-world problem solving, but few of the governance processes explicitly or exclusively refer to 'agroforestry', so we need to be part of much broader coalitions to be effective

components: what are the existing rules, regulations, institutions and incentive systems for natural resource and (agroforestry) land use at international, national, regional and local scale, and how can these instruments be modified?
interactions: how can reward structures for environmental service functions provide incentives for rural poor in ways that are transparent, fair and efficient?
emergent properties: how can existing capacity building at various scales and levels better prepare next generations for (truly) integrated natural resource management based on human, social, natural, infrastructural and financial capital?

Where

Benchmark site	Main issue	Themes
Indonesia		
E. Kalimantan	Tenure, Support of IFAD dev. Project	G, (F)
W. Kalimantan	Rubber agroforests	F
Jambi - Muara Bungo	ASB^{II} benchmark, Rubber agroforests, Biodiversity, Rup?	(T),F,L,G
Lampung – Krui,	Damar agroforests, Tenure	L,G
Sumber Jaya	NSS pilot for watershed functions, Rup?	T,F,L,G
Pakuan Ratu	ASB^{II} benchmark, SAFODS	T,F,L
W. Java – Halimun ecosystem	Tree and market support	T,(G)
E.Java	Support of IFAD dev. Project	(F)
NTT, NTB	Support of IFAD dev. Project	T,(F)
Philippines		
Mindanao – Claveria	Landcare, SAFODS	T,F,L
Mindanao - Lantapan	Landcare, Rup?	T,F,L
Visayas – Leyte	Landcare, Rup?	F
Bohol	Landcare	T,F
Thailand		
Mae Chaem	ASB^{II} benchmark, Watershed functions	(F),L,G
Vietnam		
Don Khao	Watershed functions	F,L
Yunnan – China		
Upper Mekong	Watershed functions, Rup?	L,(G)

ASB = Alternatives to Slash and Burn
IFAD = International Fund for Agricultural Development
NSS = Negotiation Support System
SAFODS = Smallholder agroforestry on degraded soils
Rup= candidate site for project on 'Rewarding Upland Poor for the Environmental Services they provide' (RUPES)

A number of our activities are not bound to specific benchmark sites. These include:
T: AgroforesTree database, wood density database, fractal tree branching methods,
F: Simulation of tree-soil-crop interactions (WaNuLCAS), tree-tree interactions in mixed forest (SexI-FS, SLIM)
L: FALLOW^{++} and GenRiver models
G: Support to SEA Network for AgroForestry Education (SEANAFE), Support for law reform processes

Partners in all these activities include
  ➢ Government Research & Development Centers (Forestry, Agriculture)
  ➢ Universities
  ➢ NGO's
  ➢ International Research & Development Agencies

ICRAF is here to work with _you_ on:

Agroforestry solutions for todays problems, and for a bright future…

Multistrata coffee gardens are a good source of firewood

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