

The ecosystem approach to forest rehabilitation - theory and practice

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Take home message

- Ecosystem Approach recognises that reforestation causes (i) economic changes (ii) ecological changes and (iii) social impacts
- Not all landholders believe they will benefit from reforestation (although the country as a whole may)
- Therefore need to consult with landholders and other stakeholders to share cost as well as benefits
- This will involve changes in governance (more collaborative, more decentralised, more participatory) and will be politically difficult
- Need to be aware that situations can change and must be able to respond if they do

The Ecosystem Approach and the Landscape Approach are complementary

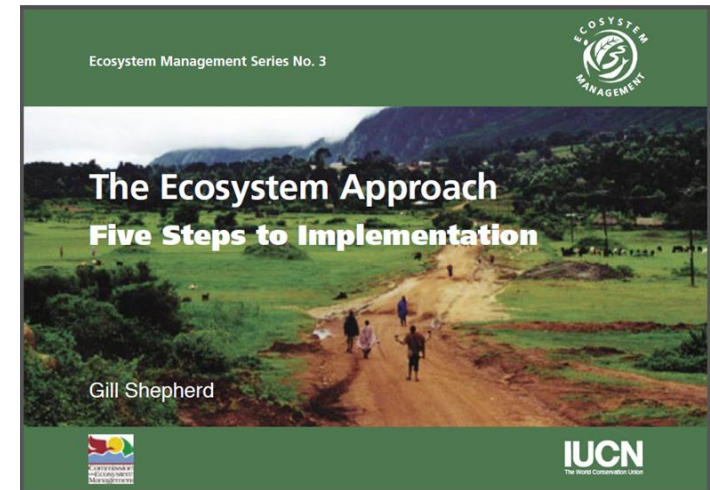
- Landscape Approach involved decisions about
 - How much
 - Where
 - What type
- Concluded that
 - reforestation has opportunity costs
 - not all farmers necessarily interested (even though reforestation has national benefits)
 - likely to involve trade-offs

Raises important questions

- What are the social and economic impacts of reforestation?
- Who will benefit?
- Who will bear most of the costs?
- How to ensure benefits and costs are shared fairly between landholders, the community and the state?
- Ecosystem Approach tries to help answer these

The Ecosystem Approach

- Formulated by Convention on Biodiversity to guide activities
- Has 12 principles
- Can be organised into 5 steps



Ecosystem Approach - Five steps

1. Determine the area to be reforest and the main stakeholders involved
2. Determine the goods and ecosystem services required and **therefore** the most suitable types of reforestation
3. Identify economic issues affecting stakeholders and how these influence reforestation choices
4. Consider landscape context in which reforestation will be done (will this alter decisions in #2 and #3?)
5. Plan for adaptive management to achieve long-term objectives

STEP 1. Determine the area to be reforested and the identity of main stakeholders

Grower	Reforestation area
State	"Unused" land, Degraded lands? Important watersheds?
Corporations	Good land close to transport
Households	Own farmland
NGOs	Areas of conservation interest?

Other stakeholders wanting reforestation include - industry (resources), neighbours (erosion control, air pollution) , water users, conservation bodies

BUT

- Not everyone wants to grow trees
 - Owners may prefer to use land for agriculture
 - Some may actively oppose reforestation
 - Reforestation has an "opportunity cost"
- Other "stakeholders" - some are local but some live some distance away
 - Should they be heard?
 - Who are most important - locals or 'off-site' people?
 - Should non-resident be able to dictate land use to owners?

STEP 2. Determine the goods and ecosystem services required and type of reforestation needed

Grower	Object and type of reforestation preferred
State	<u>Originally</u> : want timber resources [<i>plantation monocultures</i>] <u>Now</u> : also environmental protection and pollution control [<i>rehabilitation and Ecological Restoration</i>]
Corporation	Want (cheap) timber of uniform quality [<i>plantation monocultures</i>]
Household	Want diverse goods (and services?) to reduce risk [<i>plantation monocultures and species mixtures</i>]
NGOs	Want mostly ecosystem services [<i>species mixtures and Ecological Restoration</i>]

The silvicultural systems of the past may not be suitable for future needs

- Current plantation model is good for producing timber on an industrial scale
- BUT - is not necessarily best form of reforestation for
 - Small farmers
 - Supplying ecosystem services (e.g. erosion control, watershed protection)
- Need to develop new reforestation methods?

STEP 3. Economic issues affecting stakeholders and implications for reforestation methods

Grower	Issues
State	May want to reforest degraded land but face competition for funds from other sectors
Corporate	Expensive to get large areas of Mostly interested in plantations with short rotations
Household	Often have only small areas of land, Reforestation is an expensive new land use - need access to capital and knowledge (techniques, markets)
NGO	Mostly have only short-term funding

ALL: only limited market for supply of ecosystem services?

How to make reforestation attractive to landholders?

- Reforestation has some unattractive feature
 - Costly and risky
 - Poorly understood technologies
 - Seems unlikely to generate short-term benefits?
- Need methods that make it more attractive
 - Provide higher benefit (financial or non-financial)
 - Share costs with beneficiaries (*subsidies?*
Payments for Ecosystem Services?)
 - BUT how to get value for money?
 - Develop low risk technologies

STEP 4. Consider the landscape context

- The landscape is not uniform
- Some areas more critical than others
- Choose strategic locations for reforestation
- Where are these?
 - **Economic**: Near roads and markets
 - **Erosion**: reforest hills rather than flat land?
 - **Conservation**: areas of high conservation value?

STEP 4: consider landscape context

But who decides these landscape design issues?

- Governments
 - Because only they can see the 'big picture' and balance local and national interests?
 - Can optimise outcomes with sophisticated models
 - BUT governments often ignore views of local landholders
- Landholders
 - Because it is their land?
 - BUT individual landholders will make localised and unconnected decisions ('the tyranny of small decisions')
- Other stakeholders
 - Because they have a legitimate interest in the outcome?
 - BUT get benefits without paying for costs?

STEP 4: Consider landscape context

How to implement a new design?

- Best if top-down AND bottom-up
- Participatory (all stakeholders)
- Collaborative (shared decision-making)
- Facilitated by a 'third party' (at least at beginning)
- Compensation when needed



Landuse planning in Laos

Participation by landholders

- Governments (and government officers) often reluctant to allow this?
 - “They are uneducated” (compared with us)
 - “They don’t have the right technical knowledge”
 - “They are selfish and don’t see the big picture”
-
- But advantages of involving landholders
 - Decisions likely to be more widely accepted
 - Can take advantage of local knowledge - know where reforestation should be done, where under-used land is
 - Can get better outcomes per \$ spent - is more efficient

Step 4: consider landscape context

Planning Forest Landscape Restoration

1. Develop a landscape view of the problem
 - Gather information (scientific and local)
 - Establish patterns of tenure, location of disputes etc.
2. Engage with stakeholders (or representatives)
 - Must avoid being dominated by local elites
3. Identify possibilities or 'visions' of future
 - How much reforestation?
 - Where should it be done?
 - What types of reforestation?
4. Decide on approach to use (where, type, how much?)
 - Need for compensation/incentives?
5. Monitor and adaptive management

STEP 5. Plan for Adaptive Management

- Changes often occur
 - Ecological (competition, fires, diseases, insects)
 - Markets (interest in services as well as timber)
 - Social attitudes (increased interest in recreation, tourism)
- Need to monitor and - if necessary - adapt methods (= 'Adaptive Management')
- **BUT** monitoring is costly - must be informative

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Questions to ponder

1. What is reforestation "success"?
2. How to make reforestation more attractive to farmers and other landholders?
3. How to make incentive/subsidies cost-effective?
4. How to persuade government agencies to allow landholders to help make decisions
5. How to carry out reforestation on a landscape scale in ways that generate household and national benefits?

Further Readings

Degradation and Forms of Reforestation

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Landscape issues - reforestation and ecosystem services

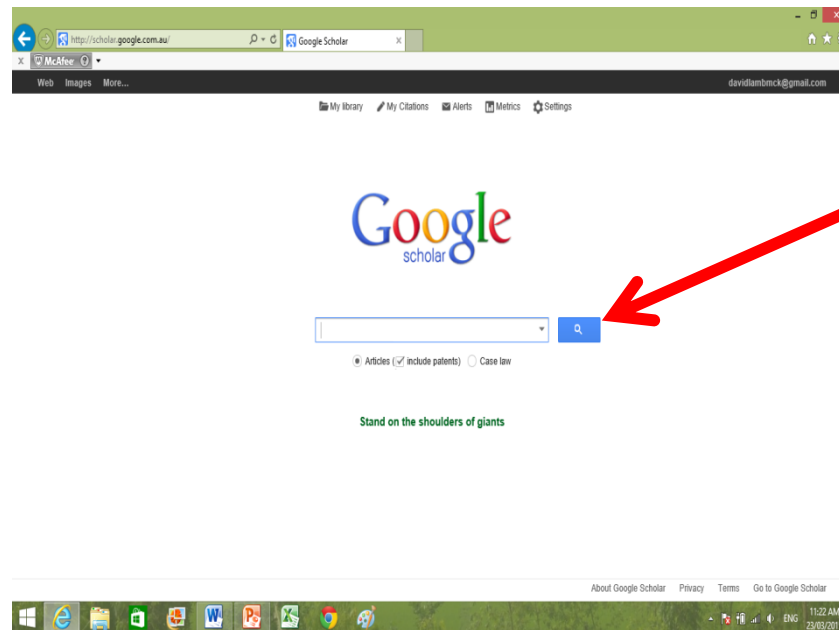
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Google Scholar

- <http://scholar.google.com.au/>



Google search bar with the query "teak myanmar" and a search button.

Search results summary: About 2,280 results (0.10 sec). Includes a "My Citations" button.

[HTML] [Three centuries of Myanmar monsoon climate variability inferred from teak tree rings](#) wiley.com [HTML]

R D'Arrigo, J Palmer, CC Ummenhofer... - Geophysical ... , 2011 - Wiley Online Library
[1] Asian monsoon extremes critically impact much of the globe's population. Key gaps in our understanding of monsoon climate remain due to sparse coverage of paleoclimatic information, despite intensified recent efforts. Here we describe a ring width chronology of ...
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[PDF] [Teak resources and market assessment 2010](#) teaknet.org [PDF]

W Kollert, L Cherubini - FAO Planted Forests and Trees Working Paper ... , 2012 - teaknet.org
... 3. **Teak** areas. Natural **teak** forests are estimated to cover 29.035 million ha in India, Lao PDR, **Myanmar** and Thailand. Almost half of the total is in **Myanmar**. ... A maximum sustainable supply of quality **teak** from **Myanmar** is likely to be in the order of 400,000m³/yr or less. ...
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