



The Intertwining Issues of Forestry and Upland Agriculture in Most Developing Countries in Tropical Asia - Implication to Climate Change



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In developing countries like in tropical Asia, AGRICULTURE continuously expands in the FORESTS. Agricultural expansion is a major cause of deforestation and forests degradation, which are significant sources of GHGs emission, particularly carbon. Many of the rural poor in the countries live near or inside the forests, where subsistence agricultural crop production is central component of their livelihood and food source. They are the people who are going to be the hardest hit by the effects of climate change. On the other hand, they can also potentially contribute to mitigation efforts.

Forest and upland agricultural issues

- Forests are under pressure from loggers
- Poor people need fuel wood and wealthier world demands more wood and pulp
- Croplands, pastures, and plantations are expanding into natural forests while some farmlands are abandoned
- Farm expansion into the forest is driven both by wealth and poverty
- A growing, increasingly wealthy urban population demands commodities produced at the forest margins and frontiers

Forestry dilemma and upland agriculture challenges

Improvement in the productivity and sustainability of the production systems of the people directly dependent on forests and agricultural activity therein for their food and livelihood, while environmental considerations are taken into account.

New opportunities are emerging through Clean Development Mechanisms for developing countries, and attracting foreign investment into, carbon mitigation projects. But, could the carbon finance reduce deforestation and promote sustainable upland agriculture?

Figure 1: Process of change in the forests brought about by agricultural activities

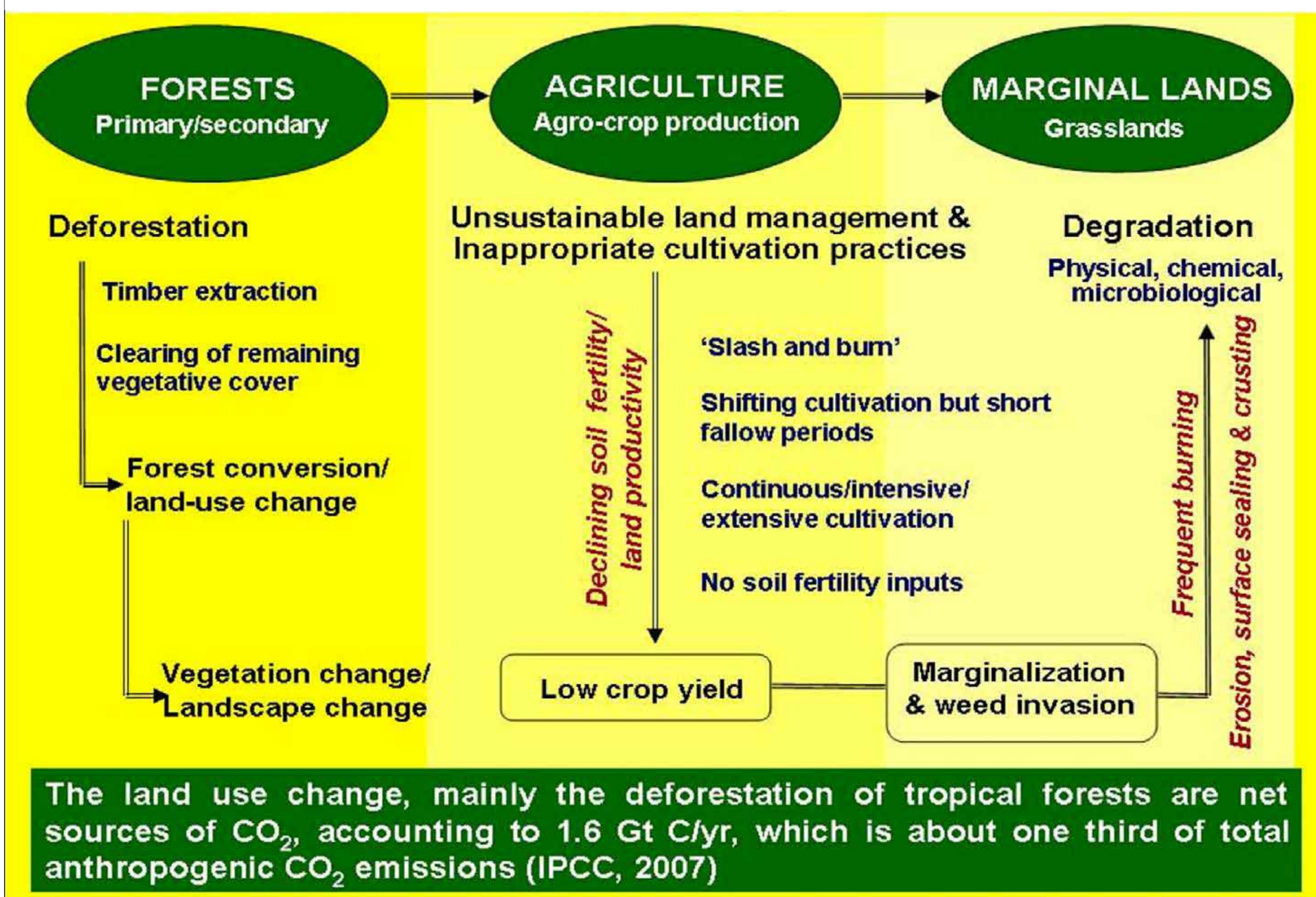
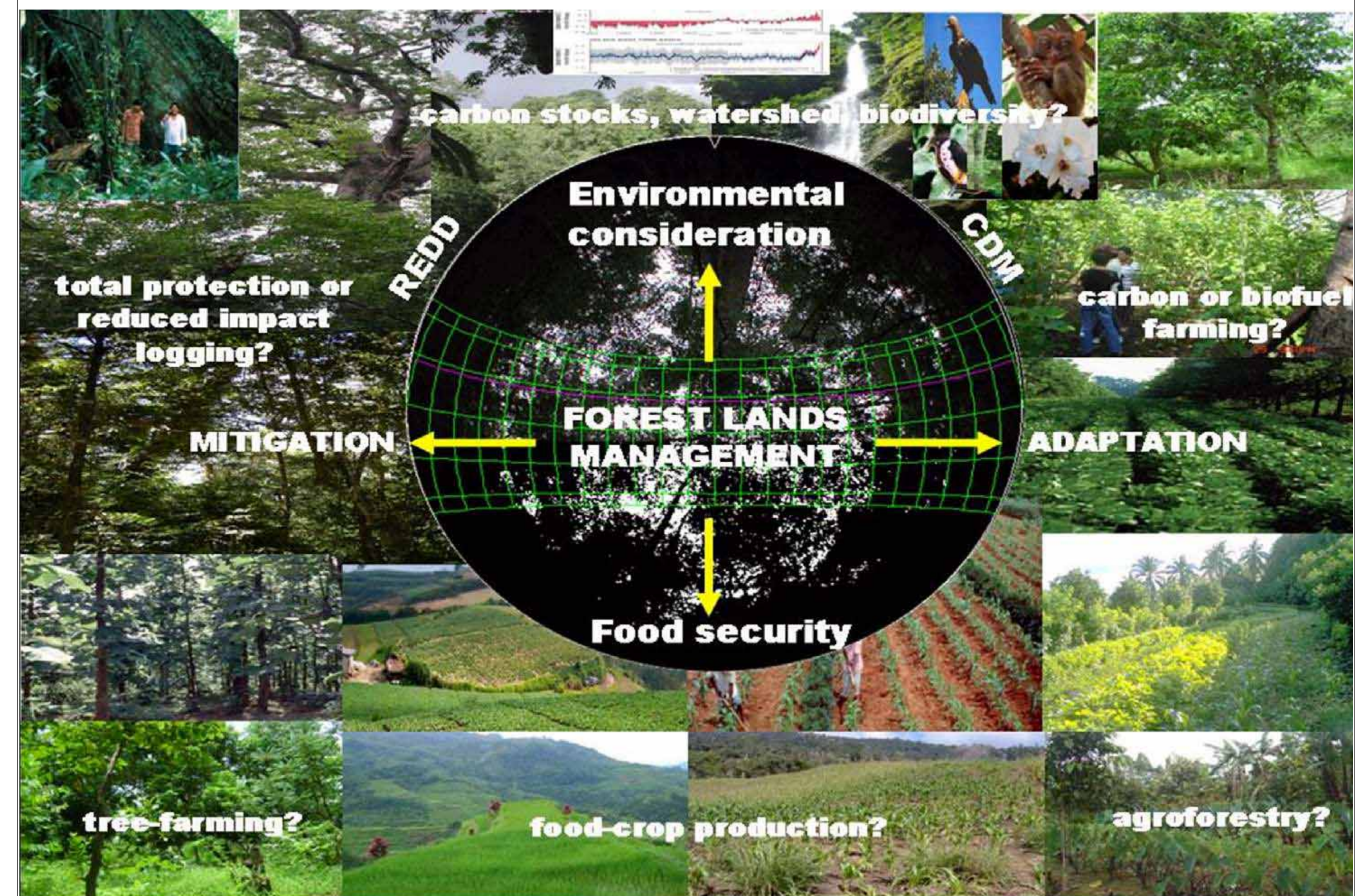


Figure 2: Forestry dilemma and upland challenges



Key issues facing forestry and upland agriculture and their participation to counter global warming

- Mitigation option for forestry and upland agriculture
- Adaptation strategy in forestry and upland agriculture
- The practical consideration in relation to the inclusion of agroforestation (tree farming and agroforestry farm development) in an emissions trading scheme
- The recognition of agroforestry systems as carbon sinks and offsets

Mechanisms for climate change mitigation and adaptation while providing livelihood and food sources

- **REDD** for forestry carbon stock conservation (Forest protection/reservation, Natural Forest Regeneration, Assisted Natural Regeneration)
- **CDM** for upland agriculture carbon sequestration (Agroforestation)
- **PES** for biodiversity conservation/habitat restoration, watershed management/ rehabilitation (A/R- Rainforestation, Agroforestation, Enrichment planting, Assisted Natural Regeneration)

Figure 3: Responses to global warming

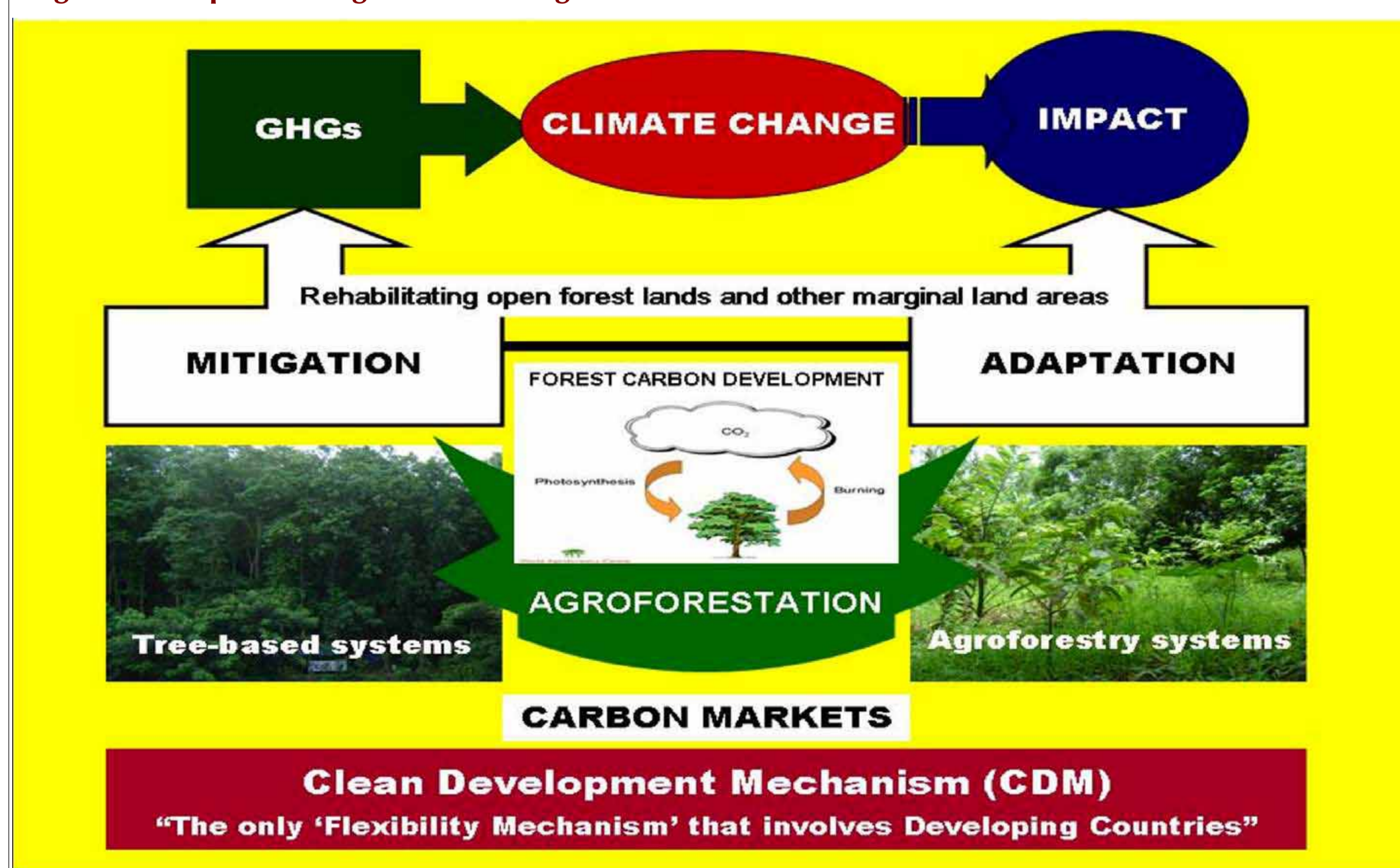


Figure 4: Proposed technological mechanisms for forests landscape restoration

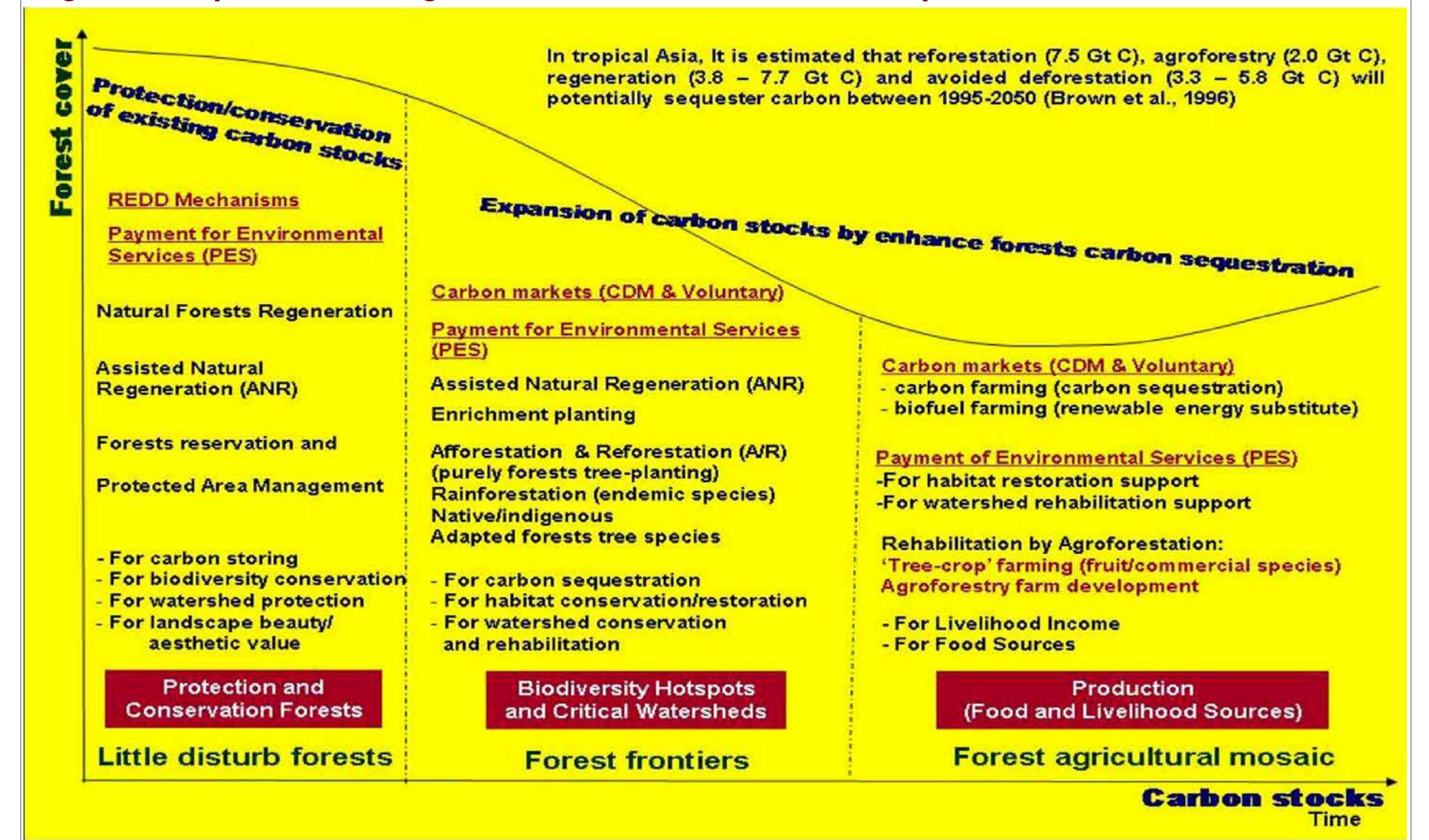


Figure 5: Methods in defining and characterizing forest lands for valuation of carbon projects

Qualitative	Quantitative
1. TECHNOLOGICAL Suitability Land eligibility Tenure status Project scheme Afforestation/Reforestation/Agroforestation/ Rainforestation, Assisted Natural Regeneration Enrichment planting Natural Forest Regeneration Forest area protection/conservation 2. INSTITUTIONAL Stakeholder's Assessment Implementers/project participants Proponents/partners/collaborators Institutional Operation Social/community preparation Funding source/financing scheme Project sustainability consideration Policy Support Assessment Enabling policy implementations National/local policies Global/international policies	1. CARBON SEQUESTRATION POTENTIALS Measure baselines (carbon from existing vegetations) Potential carbon storage/sequestration Identify (possible) sources of leakage Anticipated total emission reduction purchase agreement value 2. ECONOMIC VIABILITY/PROFITABILITY Potential income and other economic opportunities to the stakeholders/farmer participants Safety nets and compensatory measures for the affected people/minority, in case of displacement Project area development generates sustainable income for the local community 3. OTHER ENVIRONMENTAL SERVICES Provides local environmental benefits/services biodiversity conservation/habitat restoration watershed areas protection/rehabilitation Promotes sustainable use and management of natural resources Project uses cleaner, more efficient and adopt environmentally-friendly technology

It is necessary to concretely define and characterize the technological, economic, and social (people) as well as the institutional dimensions in the uplands (mosaic lands) as a complex agro-ecological zone, and the forest lands in general. Value the resources, and its contribution to the global concerns (climate change issues) and to national/local economy and environmental concerns using appropriate valuation techniques.

Success of development efforts for climate change mitigation and adaptation depends on people's acceptance and participation, availability of technological innovations, appropriate institutional approaches, and sound policy environment in which the country operates. These include, inter-alia, land-use planning, policy support and operational rules concerning forest land management activities for poverty alleviation and sustainable development.

The future of the global carbon market still depend largely on the demand for CDM/REDD projects from developing countries.

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