Integrating Livelihoods and Multiple Biodiversity Values in Landscape Mosaics

Research Guidelines Version 1

General Section

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Contents

Annexes

1. Introduction

Summary

The Landscape Mosaics Project is an integrated research and development project whose objective is to improve the livelihoods of local communities and biodiversity conservation in sites in five developing, tropical countries. These five sites are:

1. Tanzania: East Usambara Mountains, Tanga Region;
2. South West Cameroon: Takamanda-Mone Technical Operation Unit ;
3. Sumatra, Indonesia: Bungo District, Jambi Province;
4. Northern Laos: Vieng Kham District, Luang Prabang Province; and
5. Eastern Madagascar: Manompana corridor, Soanierana-Ivongo District.

The Landscape Mosaics Project aims to utilize the information gathered from its research to affect at least one, key policy process in these sites in order to improve the livelihoods of the local communities and contribute to the sustainable use, and conservation, of flora and fauna within forests in the project area.

The Landscape Mosaics Project is the first project of the Biodiversity Platform, a joint venture between the Center for International Forestry Research (CIFOR) and the World Agroforestry Centre. The project is funded by the Swiss Agency for Development and Cooperation and supported by other donors such as the European Commission, and the Governments of Finland, the Netherlands and Australia.

How to use this document?

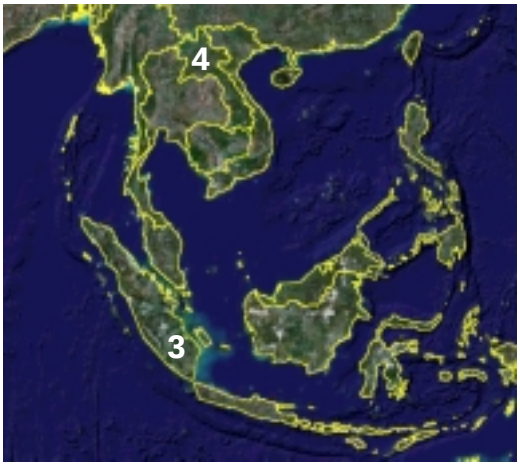
This document is primarily intended as an operational document for site-based project teams. It summarizes the suggested project approach but this first version remains flexible and open to changes according to your inputs along the project life.

The schedule of activities **(sections 5-8)** are designed to be a planning tool, giving project teams an overview of the objectives, the steps involved, staff requirements, timeframe and outputs of each of the activities. For more detailed information about each of the activities, see the accompanying document titled **"Field Methods"**. There are also annexes that provide a suggested sequence of activities and a guide for the staffing requirements for the project.

The work flow diagram on **page vii** shows the order of activities, and how the empirical research affects the **Facilitating Communication for Improved Conservation and Development** component. The diagram also shows how the research contributes to answering the **Thematic Research Questions.**

The research questions, which follow immediately after the workflow diagram, guide how the research activities are structured. The purpose of the research activities is to provide the theme leaders and project coordination team with the necessary information to answer these questions. Project teams only need to be aware of these questions and conscious that their research will contribute to answering them. Beyond that**,** no action is required by project teams regarding the research questions.

Location of project sites



African Sites:
1: Tanzania
2: Cameroon
5: Madagascar

Southeast Asian Sites:
3: Indonesia
4: Laos

Background

As more of the world's forests rapidly disappear and become increasingly fragmented, conservation efforts have focused on establishing protected areas to conserve these key ecosystems that support a diverse array of flora and fauna. More recently, conservationists and scientists have observed that protected areas are necessary but not sufficient for the conservation of biodiversity. In this context, the role of multifunctional landscape mosaics, especially those surrounding protected areas, has become increasingly important.

These landscapes include everything from agricultural land, agroforests, and settlements to patches of remaining forest dotting the terrain. What has shaped, and continues to shape, these mosaics are human activities, most commonly communities who are driven by their needs to sustain their livelihoods mostly in the face of poverty. These communities often rely on forests, and the plants and animals within, for food, medicine, firewood, building materials and other life-essentials. As a consequence, local communities have an integral role to play in the conservation of forest biodiversity and the sustainable use of forest products.

Previous research and conservation projects have learnt that it is necessary to engage local communities in forest conservation rather than excluding them. Research undertaken by CIFOR and the World Agroforestry Centre amongst others have shown that in order to elicit the participation of local communities, it is necessary to allow them to determine the future of their landscape that is both sustainable and beneficial to them. These futures cannot exist in isolation: they must be negotiated with different levels of government and their institutions, along with other stakeholders that have an interest in the use of the landscape, such as private companies and NGOs.

The Landscape Mosaics Project aims to enable communities to effectively negotiate their futures. The project will facilitate visioning, social learning, empowerment and negotiation processes within communities and local government, along with sharing scientific information gathered from the sites. The project will further help to support any agreement made through investigating the potential of reward mechanisms for biodiversity conservation along with facilitating partnerships with local, national or international organizations that have an interest in the sustainable management of the landscape.

Research approach

The central purpose of the Landscape Mosaics Project is to understand how a combination of action and empirical research can contribute to improving both the livelihoods of local communities and the conservation and sustainable use of forest resources. The project has proposed a method, based on the extensive experience of scientists at CIFOR and the World Agroforestry Centre that will be tested and refined throughout the project. The lessons learned from the Landscape Mosaics Project will be shared with other conservation and development projects and the scientific community. The project will also seek to determine what key scientific information is required to support the processes that can successfully improve landscape management and the effectiveness of this method for influencing policy.

The data gathered from the five project sites will be used to test and answer several thematic scientific hypotheses and research questions. These questions relate to biodiversity in multifunctional landscapes: its functions, uses and methods to conserve it. By answering these questions the project will help to inform the broader scientific and conservation community and enable them to build on the lessons learned from this project for future conservation, development or research projects.

Project landscape

In each of the five countries, research will be undertaken in three territories in a landscape located in a gradient ranging from dense forest in protected areas to areas which are becoming increasingly fragmented due to intensive agriculture. The gradient may encompass mosaics of forest patches, secondary forests, agroforests, plantations, agricultural land, gardens and settlements.

Scales of analysis

The project will focus on investigating the livelihoods and facilitating the visions of communities within these selected three local territories. Surveys will take place at the community and the household levels, using various methods like household surveys, participant observation, focus groups discussions, and workshops.

Biophysical data will be gathered along the gradient using plots located in the selected local territories. The data collection will focus on utilized species of flora and fauna as well as an overall focus on the tree- and forest covers. This data will be correlated and enhanced using spatial analysis and satellite imagery.

The Landscape Mosaics Project also acknowledges that the governance of the landscape is simultaneously influenced by multiple levels, and so will examine governance at the community, district, provincial and national levels in order to understand how the landscape is governed.

The facilitation process to improve communication and, when possible, develop agreements between local communities and administrative authorities, will include representatives of communities and all key stakeholders involved in the management of the natural resources of the landscape.

Workflow Diagram

Facilitating Communication for Improved Multifunctional Landscape Management

	Activities						
	5.1	5.2	5.3	5.4	5.5	5.6	5.7
	Inception workshop, stakeholder and partnership identification	Definition of impact pathway and project landscape	Definition of local territories (spatial information and mission)	Stakeholder analysis, Visioning (local – landscape)	Supporting participatory planning and confidence-building within levels (local-district)	Supporting communication, linking levels and Informed consensus building	Negotiation of agreement and planning for continuity
6. Monitoring	→			Indicators for landscape outcome monitoring	Monitoring facilitation process	Monitoring facilitation process and monitoring the use and relevance of research outputs	Monitoring outcomes

Empirical Research

Results from Individual Research Activities							Research Outputs		
7.1	7.2	7.3	7.4	7.5	7.6	7.7	8.1	8.2	8.3
Review existing information	Spatial analysis 1	Policy terrain and reward mechanism analysis	Household- and community-level profiles in the three local territories	Spatial analysis 2: landscape patches	Local level field surveys	Profitability and market chain analyses	Synthesis: governance aspects	Synthesis: socio-economic and conservation aspects	Synthesis: landscape configuration

Thematic Research Questions

2. Compilation of overarching and leading research questions

Overarching Question at Project Level
How impactful have our research and development approach and activities been in informing and supporting landscape planning to ensure a participatory, integrated and realistic consideration of the conservation of environmental services (ES) and the support to sustainable livelihood strategies (LS)? What are the lessons learned in terms of comparative case study research and in terms of support to negotiations?

Biodiversity and Livelihoods
How are livelihoods and governance linked to the maintenance and changes in the biodiversity observed in the selected landscapes? What kind of socio-economic or environmental changes have occurred, and what opportunities and/or threats did these impose? Did any of these changes trigger a threshold? Given these changes, what are the impacts on species that are important for livelihoods and under threat?

Rewards for Biodiversity Conservation
What, if any, is the potential role for conditional incentives to conserve biodiversity and resolve contestations between forestry, agroforestry and agricultural land uses?

Landscape Governance
Empirical research 1. What are current governance arrangements at local and district levels and how do they influence ability to reconcile diverse stakeholder interests as well as livelihoods and biodiversity conservation? *Action research* 2. Which governance innovations (process and outcome) are effective in reconciling diverse stakeholder interests as well as livelihoods and biodiversity conservation?

Landscape Patterns
How does the spatial configuration of tree cover contribute to the maintenance of tree diversity and useful and endangered species? What is the effect of accessibility (physical and institutional) on patterns of exploitation and the availability of selected resources?

3. Compilation of the needed outputs and information

Facilitation:	
1.	Workshop report (identification of potential issues or potential opportunities for intervention at landscape level)
2.	List of stakeholders
3.	MoU with partners
4.	Definition of significant shared concerns between major stakeholders, with a high potential of interest to local communities and avenues for community engagement (land allocation processes, community forestry, reward mechanisms)
5.	Delineation of a project landscape relevant to discuss the defined concerns
6.	Key stakeholders are aware of PAR principles and processes
7.	Identification of local territories, information of and collaboration approved by the local population (preliminary information on ethic groups, access to markets, land use planning issues, forest management, etc.)
8.	A clearer definition of what to negotiate with other stakeholders
9.	Actions groups and empowered local representatives, with clear ideas of their targets and self-confidence and capacity to negotiate
10.	Empowered local representatives and clearer definition of areas of agreement and issues to negotiate
11.	Improved communication between levels and information about differences in perceptions
12.	Local and landscape level stakeholders informed of results of research activities, contributing to an increased awareness of the dynamics of forest systems within the landscape and a knowledge of potential reward mechanisms or markets
13.	Mechanisms for collaboration and places of negotiation identified
14.	Agreement and when possible reward mechanisms
15.	Monitoring mechanisms designed and initiated
16.	Management structure created along with timeline for implementation of agreement

Monitoring

1. Evaluation of the efficiency of the project to deliver outputs (project reports)

2. Documentation/Evaluation of the facilitation tools and exercises (workshop, meeting reports)

3. Evaluation of the new resolutions and outcomes reached from negotiations (potential of changes in local resource management and governance capacity)(baseline and indicators from outcome monitoring workshop)

4. Project level: Evaluation of the effectiveness of R&D approaches for reconciling priority livelihood and biodiversity values (reports from self-evaluation and global workshops).

Dataset related to empirical research:

General

1. List of existing (grey) literature:

Existing research results incorporated into design of Research activity 1 to 7
- Spatial information (maps, GIS layers)
- Policy-related studies (including rewards)
- Local socioeconomic studies and plans
- Biophysical surveys
- Economic surveys

2. Village-level information (key informants)

- Name, history
- Administrative status
- Coordinates, distance/access to markets, boundaries

Biodiversity and Livelihoods

1. Livelihoods:
   - Community status (health, education, infrastructures, etc.), "wealth" characteristics;
   - Demographic trends: population growth, in and out-migration;
   - Farming system, access to land and management rights;
   - Household profiles: income sources (cash and subsistence) and assets
   - Differentiated investment and consumption preferences, income distribution (by gender, age ethnicity, interest groups)

2. Uses or threats linked to wild species:
   - Local landscape perceptions (local nomenclature for land use types, physical, spatial or property categories)
   - Local perceptions of uses and values of forests and agroforests by focus groups(MLA method);
   - Cultural and spiritual belief systems and traditional values regarding land use;
   - 5 Priority Species (flora and/or fauna) of local value, occurrence (vulnerable/widespread), status/threats (habitat change, exploitation), quantity harvested annually, intensity of management, habitat according to local typology (link with spatial analysis and field surveys); and
   - 3-5 of the most threatening pest/invasive species occurrence, status/trends (habitat change, exploitation).

Rewards for Biodiversity Conservation

1. Environmental services/products with potential for reward schemes (biodiversity, water, erosion control), description of existing and potential rewards schemes and of related regulations

- Beneficiaries/potential "buyers" of environmental services, objects to protect; criteria for priority setting (rarity, location, etc.): conservation agencies, water users, etc.;
- Willingness and means to reward environmental (conservation) services, evaluation of the implementation potential;
- Discussion of operational mechanisms (including conditionalities, possible intermediaries); and
- Need and means of monitoring.

2. Effects of existing reward schemes in the site if any

3. Interests/concerns of local stakeholders regarding conservation of the resource are documented

4. Analysis of market chain of commercialized priority species: identification of actors, value addition and cost-benefit analysis, constraints and opportunities along the value chain

5. Evaluation of the economic costs of pests

6. Return to land and labour of the different land uses, benefits of conversions, estimation of needed compensations

Landscape Governance

1. Community governance

- Governance structure, decision-making processes, various social groups and their inclusion, associations;
- Enforcement mechanisms, conflict resolution;
- Livelihood response to shocks and trends (if relevant, include private sector), risk coping strategies (health, economic crisis, climatic events, pests and diseases, etc.);

2. Related to specific forest/tree-based systems:

- Participation in formulation of local rules and formal policies
- Representation structure, degree of communication within and between administrative levels, information about statutory rules; and

3. Focus on NRM

- Local management and conservation of forest resources/tree-based systems (rules, means of control, sanctions, types of regulations by species and landscape elements, ecosystem stewards, identity of people who have control, benefit and lose out, community groups that are exempt from rules etc.);
- Effectiveness and legitimacy of local rules and monitoring systems for selected natural resources; and
- Effectiveness and legitimacy of Government rules, means of control, sanctions or

incentives.

4. Higher-level governance and drivers (From *national* to landscape level)

- Description of priority issues and interests for various government sectors concerned with land use and conservation (national strategies);
- Analysis of crucial policies and drivers affecting conservation behaviour of landscape users (including the influence of services on land use (extension, credit, inputs, etc.);
- Description of market forces influencing priority biodiversity and livelihood values;
- Description of government (or other) programs designed to improve natural resource management (forest and tree management) in sites;
- Analysis of the planned enforcement and monitoring mechanisms for NRM programs; and
- Inventory of ecological processes and species of importance to external stakeholders (conservation agencies, (I)NGOs, etc.) and governance-related interventions for their sustainable management (see REW).

5. Linkages between local and higher levels of governance (From the landscape level)

- Description of the influence of national policies at landscape level;
- Description of power and authority by categories of stakeholders;
- Analysis of the types of interactions between local, landscape and national levels (frequency, quality, and issues);
- Description of conflict management mechanisms and analysis of their use; and
- Description of how effectively national and district level policies incorporate local knowledge.

6. How the following parameters interact to influence communication between levels, co-planning and the development of landscape management agreements:

- Interaction between levels
- Contacts and impacts with research or development projects.
- Local empowerment needs
- Role of customary or local rules and practices for overall landscape sustainability
- Key power and authority vested in categories of stakeholders
- Perceived legitimacy of customary norms and formal policies on resource access and management
- Governance innovations (process and outcome) effective in reconciling diverse stakeholder interests as well as livelihoods and biodiversity conservation

6. Impact of resource use and management activities on status and trends of selected priority species in various land use types

7. Management recommendations and scenarios for local and meso-level objectives developed for selected land use types

Landscape Patterns: Spatial Analysis

1. Basemaps (topography, road, settlements, administrative boundaries, etc)

2. Land use/cover types and landscape maps with common legends (Landsat)

3. Landscape zoning according to:
i) forest cover;
ii) fragmentation;
iii) distance to roads/markets and undisturbed forests; and
iv) (if available) settlements and population density.

4. Drivers/threats (proximate and underlying) (landscape and local territory) – sketch maps

5. Area-based assessment of relations between tenure, land use and institutions

6. Georeferenced socio-economic data

7. Local value of biodiversity (local territory) – georeferenced/sketch, tagged to land use/cover types

8. Field biodiversity measure (local territory) – georeferenced, tagged to land use/cover types

9. Customary ownerships, protection status – georeferenced data tagged to land use/cover types and maps

10. Land cover maps focusing on tree-forest covers

11. Land use/cover change map: least/highly disturbed forests, agroforests, tree plantations (monocultures), old fallows

12. Priority conservation area (as habitat and as corridor or stepping stones), biogeographical variation (e.g., altitudinal transitions), secondary data (DEM, climate, soil, etc.)

Landscape Patterns: Field Surveys

1. Criteria to define quality of tree-based systems

2. Priority species/services: uses, values and management practices. Population ecology (dispersal mode)

3. Transects and accessibility (travel time) to selected tree-based systems (physical and institutional);

4. Plot inventories: Tree diversity, presence of key species, biophysical characteristics: topography, soil types, vegetation type, land use history, configuration of woody cover; and

5. Optional: fauna surveys

4. Exhaustive List of Hypotheses and Research Questions

Overarching Question at Project Level
How impactful have our research and development approach and activities been in informing and supporting landscape planning to ensure a participatory, integrated and realistic consideration of the conservation of environmental services (**ES**) and the support to sustainable livelihood strategies (**LS**)? What are the lessons learned in terms of comparative case study research and in terms of support to negotiations?

Secondary questions:
What are the trends of and relationships between ES and LS? What are the current values, issues and demands? [Descriptive question, inclusion of different knowledge] What are the institutions, rules and incentives that had the most significant influence on ES and LS in the past? From which circles did these rules and incentives come? Is there a lack of coherence or of power balance between the different management levels? [Understanding past driving forces] What can we learn from past impactful processes? What is the potential of a reward mechanism combining ES to LS? How to link the different knowledge, values and levels? [Defining future impact pathways]

Theme 1: Biodiversity and Livelihoods

Hypothesis:

Timely empowerment of local population through integration of scientific and local knowledge, e.g. on utilized species and thresholds of sustainable use, can mitigate biodiversity loss and maintain or increase livelihood security provided that local people have adequate scope/power for decision making regarding natural resource use.

Leading Research Questions:

How are livelihoods and governance linked to the maintenance and changes in the biodiversity observed in the selected landscapes?

What kind of socio-economic or environmental changes have occurred, and what opportunities and/or threats did these impose? Did any of these changes trigger a threshold? Given these changes, what are the impacts on species that are important for livelihoods and under threat?

Complementary questions:

Under what circumstances and how can local knowledge and/or practices contribute to livelihoods security and biodiversity loss mitigation?

How can complementing a local knowledge base with scientific and market information promote resilience and reduce vulnerability?

Linking questions to the Governance Theme:

How can political processes, institutions and markets more effectively incorporate local priorities?

To what extent is local knowledge reflected or incorporated into customary and/or state regulatory frameworks?

Theme 2: Rewards for Biodiversity Conservation

Hypothesis:

Rewards for biodiversity conservation will only work where:

- External value is greater than the local value of land use systems of intermediate intensity[1];
- Local regulations based on local environmental services overcome individual decisions; and
- External commitment is serious and follows up on promises made.

Leading Research Questions:

What, if any, is the potential role for conditional incentives to conserve biodiversity and resolve contestations between forestry, agroforestry and agricultural land uses?

Complementary questions:

What do we want to reward or compensate (environmental services related to biodiversity)? What are criteria to set priorities?

- What kind of environmental resources do we want to protect?
- What is their level of endanger?
- How can we measure/control their conservation or improvement (indicators)?

Where are these resources located, precisely?

Where are these resources located, precisely?

- Identification of stakeholders
- Who are they?
- What are their relationships?
- How do they interfere with the resource (activities, utilization, exploitation, economic valuation…)?
- What are their interests/concerns in the conservation of the resource?

Who are ecosystem stewards?

- Local management of natural resources (rules, means of control, sanctions)?

Who are environmental beneficiaries?

- What are they prepared to do to protect the resource?
- Are they serious and will they follow up promises?
- Who are intermediaries?

What are the effective local rules and what is the nature of any monitoring systems for natural resources?

- How effective would local regulations be in view of negotiated commitments for conservation?
- Government rules, means of control, sanctions or incentives?

[1] Land use systems of intermediate intensity are represented by land uses maintaining a diverse tree cover (utilized forests, mixed plantations, agroforests, etc.).

- Research or development projects?
- Are there existing reward schemes in the site?
- Why are those reward schemes working or not working?

How can we estimate the value of natural resource?
- What the return to land of the different land uses?
- Are there products that have commercial potential?
- Are there existing markets upon the resource (NTFP…)?
- What would be to compensate in the case of deforestation?

What kind of reward schemes could be provided?

Theme 3 – Landscape governance

Hypothesis:

Overall landscape sustainability is enhanced if public policies are informed by, allow and support customary or local rules and practices. Strengthening mutual support among levels of governance will result in better forest management and improved human well being.

Leading Research Questions:

Empirical research

1. What are current governance arrangements at local and district levels and how do they influence ability to reconcile diverse stakeholder interests as well as livelihoods and biodiversity conservation?

Action research

2. Which governance innovations (process and outcome) are effective in reconciling diverse stakeholder interests as well as livelihoods and biodiversity conservation?

Complementary Research Questions:

1a. Is overall landscape sustainability enhanced if public policies are informed by, allow and support customary or local rules and practices?

1b. Power and authority vested in which categories of stakeholders contribute to the most effective landscape management in the field?

1c. What is the perceived legitimacy of customary norms and formal policies on resource access and management by different local interest groups?

1d. What rules exist in the study communities pertaining to natural resources or forests and how effectively are they enforced? What contextual factors (social capital, wealth, security of tenure, gender relations, etc) affect the effectiveness of these rules? Which types of rules (bundle of tenure rights, seasonal, related to age/type of plant or type/sex/age of animal, etc) are most effective and should be encouraged?

1e. What are the governance-related constraints to sustainable management of species and ecological processes of importance to diverse local (household and community) and external stakeholders?

1f. Who owns or manages the forest and other natural resources in the patches of the landscape? Are there identifiable community groups that are exempt from the rules that apply generally? Is there an elite group that determines the rules that the rest of the group must follow? Are there groups, such as women, that are disadvantaged in local governance? If so, what are the implications of such internal differentiation for governance and for biodiversity conservation?

1g. What kinds of interaction (frequency, quality, and issues) exist between various social categories within communities and government or other personnel involved in biodiversity-related activities?

Theme 4: Landscape patterns

Hypothesis:

The appreciation by local and external stakeholders of the environmental services that remaining forest patches provide tends to depend on how much forest is left, as well as the spatial pattern. In forest rich landscapes, forest functions are taken for granted at the local scale, even if they represent considerable value from a global perspective; in landscapes with little forest left, the environmental services of the remaining forest may be highly valued locally, but probably represent little of interest to global stakeholders (as sensitive species will most likely have disappeared). Following this logic, it is in intermediate landscape mosaics that forms of 'environmental service rewards' will be needed, as external value exceeds local appreciation, while (supposing that loss of forest cover continues) conservation may in fact match future local appreciation. This temporal pattern of appreciation in landscapes is interacting with spatial patterns. Some landscapes remain on an 'integrated' trajectory, with a fine-grained mosaic; others switch to a 'segregated', coarser pattern. The temporal dynamics of local and external appreciation probably differ between these patterns.

Leading Research Questions:

How does the spatial configuration of tree cover contribute to the maintenance of tree diversity and useful and endangered species?

What is the effect of accessibility (physical and institutional) on patterns of exploitation and the availability of selected resources?

Complementary questions:

How does the existing [landscape] pattern influence habitat quality, dispersal ability and exposure to threat for key groups of organisms?

Where in the landscape is biodiversity most vulnerable, and why?

What are the key aspects of the landscape that are critical for maintaining ecological services?

Overall required information

Biodiversity and Livelihoods:

1. Livelihood profiles: Income sources (cash and subsistence) and assets, risks, strategies;
2. *Investment and consumption preferences, differentiated income distribution – community and intra-household (by gender, age ethnicity, interest groups), evolution over time;
3. *Local perceptions of values/status/"wealth";
4. Livelihood response to shocks and trends (if relevant, include private sector);
5. Demographic trends: population growth, in and out-migration, village history;
6. Health status - risks and opportunities, impacts of trends on nutrition, level of reliance on plants for primary health care;
7. 3-5 Priority Species (flora and/or fauna) of local value, occurrence, (vulnerable/widespread), status/threats (habitat change, exploitation), local and scientific perceptions, quantity harvested annually, intensity of management, habitat according to local typology (link with spatial analysis); and
8. Market chain: number of collectors, intermediaries, prices along the chain, processing.

Rewards for Biodiversity Conservation

1. Existing and potential rewards schemes and regulations for it
2. Environmental services/products (not covered by LIV) with potential for reward schemes (water, erosion control): initial status (quantitative and qualitative description and level of threat) and extent

Landscape Governance:

1. Species and ecological processes of importance to key local and external stakeholders, and their level of threat [*link with all themes*];
2. Community-level governance arrangements, their perceived legitimacy and effectiveness by different social groups, and their effect on livelihoods and #1;
3. Higher-level policies, drivers and services affecting livelihoods and #1;
4. Nature of interactions / linkages between different levels of governance and their effect on livelihoods of different social groups and #1 [*link with livelihoods and field surveys, for example to assess causal linkages between governance arrangements and outcomes*];
5. Critical governance bottlenecks to reconciling priority livelihood and biodiversity values of importance to key stakeholders; and
6. Effective approaches for reconciling priority livelihood and biodiversity values [*link to all themes*].

Landscape Patterns:

Field Surveys

1. Accessibility to resources (physical and institutional);
2. Distance to (least) disturbed forest;
3. Local and scientific nomenclature for land use types;
4. Biophysical characteristics: topography, soil types, vegetation type, land use history, configuration of woody cover; and
5. Focus for biodiversity: Tree diversity, population ecology of key local use species (link to LIV) and species of conservation value/priority.

Spatial Analysis and Landscape Patterns:

1. Common land use/cover types (local territory and landscape) - list
2. Time series of land use/land cover maps (landscape) - maps
3. Drivers/threats (proximate and underlying) (landscape and local territory) – sketch maps
4. Local value of biodiversity (local territory) – georeferenced/sketch, tagged to land use/cover types
5. Field biodiversity measure (local territory) – georeferenced, tagged to land use/cover types
6. Customary ownerships, protection status – georeferenced data tagged to land use/cover types and maps
7. Basemaps (topography, road, settlements, admin boundary etc) and georeferenced socio-economic data

Schedule of Activities

5. Facilitating Communication for Improved Multifunctional Landscape Management

5.1 - Inception workshop, stakeholder and partnership Identification

For more detailed methods see: Field Methods 5.1

Objectives	Steps	Who/Remarks	Indicative time frame/input:	Outputs
To introduce a representative set of stakeholders to the Landscape Mosaics project (justification, objectives, approach, timeframe, defined or expected partners, activities); To identify a key range of stakeholders actively involved in the landscapes (conservation and development); and To get a preliminary understanding of priority issues in landscape management for various stakeholder groups to be tackled by the project	5.1. a – Landscape management and stakeholder identification. 5.1. b – Initial stakeholder analysis 5.1. c – Analysis of stakeholder roles and expectations	Site Coordinator Project Partners (Facilitator) (Site Leader)	Within the first 6 months. One day for the inception workshop and input variable according to the needed meetings with partners and interested institutions.	Workshop report (identification of potential issues or potential opportunities for intervention at landscape level) List of stakeholders MoU with partners

Schedule of Activities

5.2 - Participatory definition of an impact pathway for better landscape management and a project landscape (environmental gradient)

For more detailed methods see: Field Methods 5.2

Objectives	Steps	Who/Remarks	Indicative time frame/input:	Outputs
The aim is to identify: i. relevant landscape management issues, constraints and opportunities for integrated conservation and development; ii. existing or planned ways to improve the situation; iii. a project landscape (gradient) where it will be relevant to conduct research and develop processes leading to agreements on the defined context and with interested partners; and iv introduce stakeholders to PAR Principles.	5.2.a – Participatory Definition of an impact pathway 5.2.b – Selection of Project Landscape 5.2.c – Introduction to PAR principles	Site Coordinator Project Partners Site Leader	Within the first 6 months. Input variable according to the availability of existing information and the existence of landscape- or local-level policy process that can serve as an impact pathway.	Definition of significant shared concerns between major stakeholders, with a high potential of interest to local communities and avenues for community engagement (land allocation processes, community forestry, reward mechanisms) Delineation of a project landscape relevant to discuss the defined concerns

Schedule of Activities

5.3 - Definition of local territories (spatial information and field mission)

For more detailed methods see: Field Methods 5.3

Objectives	Steps	Who/Remarks	Indicative time frame/input:	Outputs
To define and launch collaboration with the population of 3 local territories (villages) that reflect the environmental and social conditions linked to the project landscape and the selected environmental gradient and in which partners, stakeholders and local communities are interested in collaborating with us.	5.3.a - Definition of 3 zones of territories (villages) according to forest cover, fragmentation, accessibility and when possible population density 5.3.b - Field "reconnaissance" to gather initial socio-economic data	Facilitator Site Coordinator Project Partners Spatial Analyst Site Leader	Within the first 9 months. Input for a preliminary spatial analysis (environmental gradient): 4 days/site. Input for a participatory selection of local territories: 1-2 weeks of field investigation.	Identification of local territories, information of and collaboration approved by the local population (preliminary information on ethic groups, access to markets, land use planning issues, forest management, etc.)

Schedule of Activities

5.4 - Stakeholder analysis and visioning (local – landscape)

For more detailed methods see: Field Methods 5.4

Objectives	Steps	Who/Remarks	Indicative time frame/input:	Outputs
To define visions of the future of the different stakeholders and social groups. To understand the roles, interests and expectations of key stakeholders at landscape (or meso-) level as well as at local levels (stakeholders or social groups).	5.4.a - Visioning and stakeholder analysis – local community 5.4.b – Visioning and stakeholder analysis – landscape level (including indicators for outcome monitoring)	Facilitator Site Leader Site Coordinator Project Partners (Observer/Rapporteur) NOTE: The stakeholder analysis may be seen as continuous: it will be refined by "participant observation" throughout the project life as well as by the research activities: policy terrain analysis and household-community profiles.	Within the first 9 months. Time input for visioning: 1 day/exercise for each level. Stakeholder analysis continuous.	Drawings/reports about visions for the future (village development: investment in agricultural production, off-farm activities, education, etc.) by focus groups and landscape-level stakeholders. Indicators of progress with a focus on key elements of forest/tree-cover management (preparing outcome monitoring).

Schedule of Activities

5.5 - Preparing participatory planning and confidence-building within levels (local, district)

For more detailed methods see: Field Methods 5.5

Objectives	Steps	Who/Remarks	Indicative time frame/input:	Outputs
To define pragmatic, biodiversity-related shared objective to reach during the project timespan To define a plan to achieve the objective, including division of labour among action group members To build the capacity of local communities to effectively negotiate	5.5.a – Selection and facilitation of action groups (at community and district levels) in determining their shared biodiversity-related goals.	Facilitator	Regular from Early-Mid 2008 until Mid-2009. Time input variable (facilitator/socioeconomist 100%).	A clearer definition of what to negotiate with other stakeholders Actions groups and empowered local representatives, with clear ideas of their targets and self-confidence and capacity to negotiate
	5.5.b - Empowering local representatives, through skill-building (in collective action, participatory planning, conflict management, negotiations) for communication and negotiations with external stakeholders			

Schedule of Activities

5.6 – Supporting communication, linking levels and informed consensus building
For more detailed methods see: Field Methods 5.6

Objectives	Steps	Who/Remarks	Indicative time frame/input:	Outputs
To Identify shared interests between levels (local and district) To harmonize local and district level visions To empower community members and receptive government stakeholders To identify effective mechanisms for collaboration between levels To disseminate research findings	5.6.a - Defining and taking advantage of opportunities to strengthen mutual support between local and external actors	Facilitator Site Leader Site Coordinator Project Partners (Observer/Rapporteur)	Regular from late 2008 until Mid-2009. Time input variable (facilitator/socioeconomist 100%).	Empowered local representatives and clearer definition of areas of agreement and issues to negotiate Improved communication between levels and information about differences in perceptions Local and landscape level stakeholders informed of results of research activities, contributing to an increased awareness of the dynamics of forest systems within the landscape and a knowledge of potential reward mechanisms or markets Mechanisms for collaboration and places of negotiation identified
	5.6.b - Discussing the differences in the visions and ways to harmonize them both separately (community, district) and together			
	5.6.c - Establishing regular communication between local and higher levels			
	5.6.d – Disseminate empirical research findings			
	5.6.e – Identify places of negotiation			

Schedule of Activities

5.7 - Negotiation of agreement and planning for continuity

For more detailed methods see: Field Methods 5.7

Objectives	Steps	Who/Remarks	Indicative time frame/input:	Outputs
To negotiate a multi-stakeholder agreement influencing landscape management and create an action plan to implement and sustain it	5.7.a - Stakeholders mutual recognition 5.7.b - Shared long-term objective 5.7.c - Define management scheme considering reward mechanisms and markets 5.7.d - Design institutional arrangement, management organization, implementation and monitoring	External, more 'objective' facilitator for formal negotiation meetings, if possible Site Coordinator and team Project Partners (Site Leader)	End of 2009. Time input: variable.	Agreement and when possible reward mechanisms Monitoring mechanisms designed and initiated Management structure created along with timeline for implementation of agreement

Schedule of Activities

6. - Monitoring

For more detailed methods see: Field Methods 4

Objectives	Steps	Who/Remarks	Indicative time frame/input:	Outputs
To understand and report: i) the achievements of the project; ii) the project team's ability to conduct and implement the project's facilitation approach; iii) how successful the project was in terms of outcomes; and iv) the value of such research-development approach for conservation and development.	6.a - Project monitoring (outputs)	Site Coordinator Facilitator Observer/Rapporteur Site Leader Project Partners Compilation and synthesis: Project coordinators	End of 2009. Time input: variable.	a) Evaluation of the efficiency of the project to deliver outputs (project reports) b) Documentation/Evaluation of the facilitation tools and exercises (workshop, meeting reports) c) Evaluation of the new resolutions and outcomes reached from negotiations (potential of changes in local resource management and governance capacity)(baseline and indicators from outcome monitoring workshop) d) Project level: Evaluation of the effectiveness of R&D approaches for reconciling priority livelihood and biodiversity values (reports from self-evaluation and global workshops).
	6.b - Research-Development process monitoring during the "Facilitating Communication for Improved Conservation and Development" (action research) process			
	6.c - Outcome monitoring			
	6.d - Project meta-analysis			

Schedule of Activities

7. Empirical Research

7.1 - Research activity 1: Review existing information

For more detailed methods see: Field Methods 5.1

Objectives	Steps	Who/Remarks	Indicative time frame/input:	Data set
To take advantage of existing thematic studies and partner networks in relation to the research themes and the current interests/issues discussed in each site.	7.1.a - Literature search and contacts with local and district organisations or other actors that may have existing information on the site 7.1.b – Conduct a review of existing literature and data related to each phase of the empirical research	Site Leader Site Coordinator Project Partners	Mid-2008. Time input: variable.	List of existing (grey) literature: Existing research results incorporated into design of Research activity 1 to 7 - Spatial information (maps, GIS layers) - Policy-related studies (including rewards) - Local socioeconomic studies and plans - Biophysical surveys - Economic surveys

Schedule of Activities

7.2 - Research activity 2: Spatial analysis I

For more detailed methods see: Field Methods 7.2

Objectives	Steps	Who/Remarks	Indicative time frame/input:	Data Set
To elaborate supporting maps that characterize the environmental gradient of each landscape and to define zones of local territories for in-depth local studies	7.2.a – Define 3 zones according to tree-based/forest cover, fragmentation, accessibility and population in all landscapes in order to facilitate the participatory selection of local territories (see chapter 3.3)	Spatial Analyst Site Leader Site Coordinator Project Partners Note: This activity is linked to activity 3.3	Mid-2008. Time input: 4 days/site.	Basemaps (topography, road, settlements, administrative boundaries, etc) Land use/cover types and landscape maps with common legends (Landsat) Landscape zoning according to: i) forest cover; ii) fragmentation; iii) distance to roads/markets and undisturbed forests; and iv) (if available) settlements and population density.

Schedule of Activities

7.3 - Research activity 3: Policy terrain and reward mechanism analysis

For more detailed methods see: Field Methods 7.3

Objectives	Steps	Who/ Remarks	Indicative time frame/input:	Data Set
To identify the characteristics of external stakeholders' biodiversity values; and the strengths and weaknesses of land use regulations affecting local resource management focusing on existing or potential reward mechanisms for conservation	7.3.a - In relation to the other participatory steps (chapter 3), the identification of key groups who have the most influence on the landscape, including both protected and non-protected areas. Stakeholders may range from local to national. 7.3.b – Semi structured interviews with representatives from key groups 7.3.c - Conduct an appraisal of existing and potential reward mechanisms for environmental service (cf. Rapid Agrobiodiversity Appraisal)	Site Coordinator Policy Analyst/ Economist (Site Leader Project Partners)	Before September 2008. Time input: 4 days/site.	**A) Governance Theme:** Higher-level governance and drivers (From *national* to landscape level) • Description of priority issues and interests for various government sectors concerned with land use and conservation (national strategies); • Analysis of crucial policies and drivers affecting conservation behaviour of landscape users (including the influence of services on land use (extension, credit, inputs, etc.)); • Description of market forces influencing priority biodiversity and livelihood values; • Description of government (or other) programs designed to improve natural resource management (forest and tree management) in sites; • Analysis of the planned enforcement and monitoring mechanisms for NRM programs; and • Inventory of ecological processes and species of importance to external stakeholders (conservation agencies, (I)NGOs, etc.) and governance-related interventions for their sustainable management (see rewards part). **B) Governance Theme:** Linkages between local and higher levels of governance (From the landscape level) • Description of the influence of national policies at landscape level; • Description of power and authority by categories of stakeholders; • Analysis of the types of interactions between local, landscape and national levels (frequency, quality, and issues); • Description of conflict management mechanisms and analysis of their

Schedule of Activities

				use; and • Description of how effectively national and district level policies incorporate local knowledge. **C) Rewards Theme** - Environmental services/products with potential for reward schemes (biodiversity, water, erosion control), description of existing and potential rewards schemes and of related regulations • Beneficiaries/potential "buyers" of environmental services, objects to protect; criteria for priority setting (rarity, location, etc.): conservation agencies, water users, etc.; • Willingness and means to reward environmental (conservation) services, evaluation of the implementation potential; • Discussion of operational mechanisms (including conditionalities, possible intermediaries); and • Need and means of monitoring.

Schedule of Activities

7.4 - Research activity 4: Community - and household -level profiles in the three local territories

For more detailed methods see: Field Methods 7.4

Objectives	Steps	Who/Remarks	Indicative time frame/input:	Data Set
To analyse and appraise local livelihoods, perceptions of biodiversity and natural resources, land use strategies, governance and monitoring mechanisms.	7.4.a - Description of local livelihood-governance system 7.4.b - Description of household strategies (Stratified household survey) 7.4.c - Listing of key environmental products and services and of pests	Socio-economist Site Leader Site Coordinator Project Partners Spatial Analyst	Before December 2008. Time input: regular field visits during ca. 9 months. (see annex on time input/method)	**A) Village-level information (key informants)** • Name, history, administrative status • Coordinates, distance/access to markets, boundaries • Community status (health, education, infrastructures, etc.), "wealth" characteristics; • Demographic trends: population growth, in and out-migration; • Farming system, access to land and management rights; **B) Livelihoods and Governance Themes:** Community (focus groups) • Governance structure, decision-making processes, various social groups and their inclusion, associations; • Enforcement mechanisms, conflict resolution; • Livelihood response to shocks and trends (if relevant, include private sector), risk coping strategies (health, economic crisis, climatic events, pests and diseases, etc.); Households (HH surveys): • Household profiles: income sources (cash and subsistence) and assets • Differentiated investment and consumption preferences, income distribution (by gender, age ethnicity, interest groups) **C) Governance Theme (related to specific forest/tree-based systems):** Participation in formulation of local rules and formal policies • Representation structure, degree of communication within and between administrative levels, information about statutory rules; and • Contacts and impacts with research or development projects.

Schedule of Activities

				D) Focus on NRM (linked to 5.5) • Local landscape perceptions (local nomenclature for land use types, physical, spatial or property categories) • Local perceptions of uses and values of forests and agroforests by focus groups(MLA method) ; • Local management and conservation of forest resources/tree-based systems (rules, means of control, sanctions, types of regulations by species and landscape elements, ecosystem stewards, identity of people who have control, benefit and lose out, community groups that are exempt from rules etc.); • Cultural and spiritual belief systems and traditional values regarding land use; • Effectiveness and legitimacy of local rules and monitoring systems for selected natural resources; and • Effectiveness and legitimacy of Government rules, means of control, sanctions or incentives. **Uses or threats linked to wild species** • 5 Priority Species (flora and/or fauna) of local value, occurrence (vulnerable/widespread), status/threats (habitat change, exploitation), quantity harvested annually, intensity of management, habitat according to local typology (link with spatial analysis and field surveys); and • 3-5 of the most threatening pest/invasive species occurrence, status/trends (habitat change, exploitation). **E) Rewards Theme (BD conservation):** • Effects of existing reward schemes in the site if any • Interests/concerns of local stakeholders regarding conservation of the resource are documented

Schedule of Activities

7.5 – Research activity 5: Spatial analysis II: landscape patches

For more detailed methods see: Field Methods 7.5

Objectives	Steps	Indicative time frame/input:	Time frame/input:	Data Set
To provide a preliminary analysis of the forested land covers to allow the design of field surveys and to provide a land use/cover change analysis to allow discussion about past and future spatial trends	7.5.a - Spatial inventory of tree-based systems and conservation principles	Spatial Analyst Site Coordinator	Land cover maps before March and time series before August 2008.	Land cover maps focusing on tree-forest covers Land use/cover change map: least/highly disturbed forests, agroforests, tree plantations (monocultures), old fallows
	7.5.b - Land use cover change analysis (time series)		Time input: 2 weeks/site.	Priority conservation area (as habitat and as corridor or stepping stones), biogeographical variation (e.g., altitudinal transitions), secondary data (DEM, climate, soil, etc.)

Schedule of Activities

7.6 - Research activity 6: Local-level ecological field surveys

For more detailed methods see: Field Methods 7.6

Objectives	Steps	Who/Remarks	Indicative time frame/input:	Data Set
To understand how landscape configuration and history influences: i) Local perceptions of values, costs and benefits of different land cover types (link to Livelihoods Theme); ii) Tree diversity; iii) The presence of useful species and species of conservation concern; and iv) Threats of landscape change.	7.6.a – Participatory stratification and mapping of habitat patches in local territories into tree-cover categories (to adapt to data gathered in 7.4), discussion of criteria used for defining the "quality/usefulness" of tree-based systems	Ecologist (collaboration with socio-economist/ facilitator) GIS team Botanist	Mid 2008 – Mid 2009. Time input: Regular field surveys during about 6 months and subsequent botanical identification for about 3 months.	Criteria to define quality of tree-based systems Priority species/services: uses, values and management practices. Population ecology (dispersal mode) Transects and accessibility (travel time) to selected tree-based systems (physical and institutional); Plot inventories: Tree diversity, presence of key species, biophysical characteristics: topography, soil types, vegetation type, land use history, configuration of woody cover; and Tree diversity, presence of key species Optional: fauna surveys
	7.6.b - Transect walk as reconnaissance and ground-truthing of satellite maps			
	7.6.c - Sampling and implementation of plot inventories. Floristic determination of specimens			
	7.6.d – In-depth analysis of uses, local values, management activities and threats as well as occurrence and dispersal of important species or pests according to patches			
	7.6.e (optional) - Inventory of other (animal) biodiversity indicators/key species			

Schedule of Activities

7.7- Research activity 7: Economic analyses: Profitability of land use types and marketing of local forest products
For more detailed methods see: Field Methods 5.7

Objectives	Steps	Who/Remarks	Indicative time frame/input:	Data Set
To evaluate the economic profitability of the various land uses, especially linked to forest conversion, in order to evaluate the potential of success of an economic compensation To evaluate the economic benefits emerging from the use of forest products To evaluate the costs of pests	7.7.a – Conduct Profitability Analysis of land use types, including the effect of some taxes 7.7.b – Conduct Rapid Market Appraisal for the selected most important utilized species	Economist	Mid 2008 – Mid 2009. Time input: 2-3 months of specialized economic studies.	Analysis of market chain of commercialized priority species: identification of actors, value addition and cost-benefit analysis, constraints and opportunities along the value chain Evaluation of the economic costs of pests Return to land and labour of the different land uses, benefits of conversions, estimation of needed compensations

Schedule of Activities

8.1 – Synthesis: Governance aspects

For more detailed methods see: Field Methods 8.1

Objectives	Steps	Who/ Remarks	Indicative time frame/input:	Data Set
To inform the development of agreements and to identify potential improvement of the local-landscape governance system for an improved balance between livelihoods and conservation aspects.	8.1.a - Site and global level workshops	Theme leaders Project coordinators All	Mid-End 2009. Time input: 1 global workshop and regular synthesis, validation and negotiation in each site.	How the following parameters interact to influence communication between levels, co-planning and the development of landscape management agreements: Interaction between levels Local empowerment needs Role of customary or local rules and practices for overall landscape sustainability Key power and authority vested in categories of stakeholders Perceived legitimacy of customary norms and formal policies on resource access and management Governance innovations (process and outcome) effective in reconciling diverse stakeholder interests as well as livelihoods and biodiversity conservation

Schedule of Activities

8.2. – Synthesis: Socio-economic and conservation aspects

For more detailed methods see: Field Methods 8.2

Objectives	Steps	Who/Remarks	Indicative time frame/input:	Data Set
To integrate data on local resource use and biodiversity trends and provide management recommendations to local and meso level project actors for improved integration of livelihood and conservation values	8.2.a – Characterize use and management practices on local resources in various land use types and how they sustain household livelihoods (Activity 4 and 6)	Site leaders Theme leaders Project coordinators	Mid-End 2009. Time input: according to sites.	Impact of resource use and management activities on status and trends of selected priority species in various land use types Management recommendations and scenarios for local and meso-level objectives developed for selected land use types
	8.2.b - Compile population status and trends for selected priority species (Activity 6)			
	8.2.c - Assess economic profitability of use (activity 7) and the success and/or potential of reward mechanisms			
	8.2 d - Integrate information and provide recommendations for sustainable spatially-explicit landscape management in site workshops			

Schedule of Activities

8.3. – Synthesis: Landscape configuration

For more detailed methods see: Field Methods 8.3

Objectives	Steps	Who/Remarks	Indicative time frame/input:	Data Set
To provide visual and geo-referenced information to facilitate landscape planning processes, focusing on the recognition of tradeoffs between conservation and development perspectives and supporting the search for priorities and consensus	8.3.a - Analysis of the gradient (effects of distance to road/forest/village on fragmentation) 8.3.b - Integration of socioeconomic results 8.3.c - Production of maps according to the development of agreements	Theme leader for Spatial Patterns Spatial analysts Site leaders	End 2009. Time input: according to sites.	Drivers/threats (proximate and underlying) (landscape and local territory) – sketch maps Area-based assessment of relations between tenure, land use and institutions Georeferenced socio-economic data Local value of biodiversity (local territory) – georeferenced/sketch, tagged to land use/cover types Field biodiversity measure (local territory) – georeferenced, tagged to land use/cover types Customary ownerships, protection status – georeferenced data tagged to land use/cover types and maps

Annex 1: Suggested Sequence of Activities

	Activities	When?
a	5.1: Inception workshop, stakeholder and partnership identification	Within the first six months
b	7.1: Review existing information	Mid-2008
c	7.2: Spatial analysis 1	Mid-2008
d	5.2: Definition of impact pathway and project landscape	Within the first six months
e	5.3: Definition of local territories (spatial information and mission)	Within the first nine months
f	7.3: Policy terrain and reward mechanism analysis	Before September 2008
g	5.4: Stakeholder analysis, visioning (local – landscape)	Within the first nine months/ stakeholder analysis continuous
h	5.5: Supporting participatory planning and confidence building within levels (local-district)	Regular from early-mid 2008 until mid-2009
I	7.4: Household- and community- level profiles in the three local territories	Before December 2008
j	7.5: Spatial analysis 2: landscape patches	Land cover maps before March and time series before August 2008
k	7.6: Local level field surveys	Before the end of 2008
l	7.7: Profitability and market chain analyses	Before the end of 2008
m	8.1: Synthesis: governance aspects	2009
n	8.2: Synthesis: socio-economic and conservation aspects	2009
o	8.3: Synthesis: landscape configuration	2009
p	5.6: Supporting communication, linking levels and Informed consensus building	Follows 6.1 to 6.3 - Mid-2009
q	5.7: Negotiation of agreement and planning for continuity	End of 2009

Annex 2: Human Resources

Key Project Staff

Title	Responsibilities	Relevant Section(s)
Project Coordinators	Oversee synthesis and dissemination of research General project oversight	6, 7.1, 8.1, 8.2, 8.3
Site Leader	Oversee from CIFOR-ICRAF HQ site activities and reporting and supervise the site coordinator	5.1, 5.2, 5.3, 5.4, 5.6, 5.7, 6, 7.1, 7.2, 7.3, 7.4, 7.5, 8.1, 8.2, 8.3
Site supervisor (optional)	Supervise and support activities of site coordinator in place	
Site Coordinator	Guide and manage, "in-country", all activities regarding project site, including public relationships	5.1, 5.2, 5.3, 5.4, 5.6, 5.7, 6, 7.1, 7.2, 7.3, 7.4, 7.5, 8.1, 8.2, 8.3
Project Partners	May provide specialists (as listed below) or take an active part in all activity steps, either related to research or policy dialog	5.1, 5.2, 5.3, 5.4, 5.6, 5.7, 6, 7.1, 7.2, 7.3, 7.4,
Facilitator (sometimes socioeconomist as well)	Facilitate all (except 3.8) workshops and group exercises for the "Facilitating Communication for Improved Multifunctional Landscape Management" process	5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 6
Socio-economist, livelihood specialists	Coordinate household- and community level profiles in the three local territories	7.4
Ecologist	Coordinate local level field surveys	7.6
Policy analyst	Conduct policy terrain analysis	7.3
Economist	Reward Mechanism Analysis Profitability Analysis and market chain analysis	7.3 7.7
Spatial Analyst	Conduct spatial analysis Production of maps	5.3, 7.2, 7.5, 8.3
External Facilitator	Facilitate the final negotiation process	5.8

Annex 2: Human Resources

Theme Leaders

Theme	Responsibilities	Relevant Section(s)
Landscape Governance	To act as technical expert for the "Facilitating Communication for Improved Multifunctional Landscape Management" process To act as technical expert for governance related aspects of policy terrain analysis and household- and community level profiles To guide synthesis of governance aspects of project	All of section 5 5.3, 5.4 6.1
Technical Support for Negotiations	To provide advice to field teams for the negotiations process	5.6, 5.7
Biodiversity and Livelihoods	To act as technical expert for livelihoods aspects of household- and community level profiles To guide synthesis of livelihoods aspects of project	7.4 8.2
Landscape Patterns	To act as technical expert for local level field surveys To guide synthesis of landscape patterns aspects of project	7.6 8.2, 8.3
Rewards for Biodiversity Conservation	To act as technical expert for reward mechanism analysis, profitability analysis and market chain analyses	7.3, 7.7

Annex 3: Key Concepts

Key Concepts I: Biodiversity

What is biodiversity?
More than 10 million different species of animals, plants, fungi and micro-organisms inhabit the Earth. They, and the habitats in which they live, represent the world's biological diversity, or biodiversity as it is often called. The vast majority of the world's terrestrial species can be found in its forests.

The *United Nations Convention on Biological Diversity 1992* defines biodiversity as encompassing "the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and their ecological complexes if which they are part; this includes diversity within species, between species and of ecosystems".

Why is it important?

Conserving and sustainably using biodiversity is important because of the many roles that flora and fauna play: both as individual species and their interactions as parts of larger systems. Although many of the functions and potential applications of biodiversity are still unknown, the maintenance of biodiversity has importance for the survival of ecosystems and the resources and services that they provide for humans.

Biodiversity *within* species is referred to "genetic diversity" that refers to the genetic variation within a distinct population of the same species or within a population.

Through maintaining the diversity of species of, both within and between, flora and fauna ecosystems, such as tropical forests, are able to survive disturbances such as fires, wind or floods, and are able to recover more quickly from deforestation. And by sustaining these ecosystems, many services such as maintaining water quality, flood mitigation, nutrient storage and cycling and carbon sequestration are also maintained.

Biodiversity *between* species is referred to as "species diversity" that refers to the variety of species and determined by one of three groups of measurement: species richness, species abundance and taxonomic or phylogenetic diversity.

"Ecosystem diversity" refers to the broad range of ecosystems, such as tropical forests or wetlands, and the distinct ecological processes and habitat within them.

The resources provided by ecosystems range from firewood, timber, food to compounds used in medicines. These individual resources do not exist in isolation but their survival is connected other species within the ecosystem, sustaining the biodiversity of an ecosystem is critical as even seemingly insignificant species can have an important function in sustaining the existence of useful resources.

Annex 3: Key Concepts

What are the "Multiple Values of Biodiversity"?

Biodiversity is an amazingly broad concept that is understood and valued differently by many people, and which affects all people's lives differently. In reality, three main categories of value can be assigned to biodiversity: those of direct use, indirect use and non-use.

Local values often correspond to the direct use of species, e.g. for commercialized non-timber forest products, for food and medicine.

The indirect use values are mostly associated with environmental services that biodiversity may enhance, such as agricultural protection from pests and disease, pollination, biodegradation and fertilization.

The non-use values include the option value of future use of biological resources and the concept of intrinsic existence value of biodiversity, meaning that we must protect the diversity of the natural environment for its own sake. Conservation agencies and scientists often value biodiversity in this way.

The Landscape Mosaics project proposes to approach (and assess) biodiversity from three different perspectives: what matters for local people (generally direct use, possibly indirect), for conservation agencies (often non-use values) and for scientists (information related to research questions, standard and comparable observations).

References:

Center for International Forestry Research. Fact Sheet: Forests and Biodiversity.
Website:
http://www.cifor.cgiar.org/Publications/Corporate/FactSheet/forests_biodiversity.htm

Commonwealth Department of the Environment, Sport and Territories (1993) Biodiversity and its value: Biodiversity Series, Paper No. 1. Department of the Environment, Sport and Territories, Canberra.
Website:
http://www.environment.gov.au/biodiversity/publications/series/paper1/

The United Nations Convention on Biological Diversity 1992
Website:
http://www.cbd.int

Annex 3: Key Concepts

Key Concepts II: Livelihoods

Introduction

One of the world's greatest challenges today is how to balance the need to feed people with the need to preserve the environment. Nowhere is this more apparent than in the world's tropical forests and the mosaic landscape of agricultural, livelihood and urban activities that surround them.

Forests provide 1.6 billion people with food, medicines, fuel and other life-essentials. 350 million people live in or near forests and rely heavily on them for subsistence and income. Another 60 million are almost entirely dependent on forests. At the same time, forests are essential for the well-being of the surrounding environment. They conserve and nurture soil, plants and many of the world's medicines.

The Landscape Mosaics Project will examine the livelihoods of rural communities especially in the context of their relationship with the environment, most importantly forests and forest products.

The Sustainable Livelihoods Approaches

In researching and attempting to facilitate the improvement of the livelihoods of rural communities, the project will employ the Sustainable Livelihoods Approach. "Livelihood" will be considered not only as an activity carried out to earn an income, but as encompassing all the elements that affect a household's ability to ensure a living: the natural, physical, social, financial and human assets possessed or accessed. Through using an integrated conservation and development approach, the project will measure the following impacts on local communities:

- Natural Capital – the biophysical environment;
- Human Capital – health, education and skills of the local population;
- Social Capital - networks between individuals, relationships of trust and reciprocity;
- Physical Capital – physical infrastructure, plantations and other forms of built assets; and
- Financial Capital – the savings and remittances that can be used to fund improvements in the other forms of capital.

Annex 3: Key Concepts

A sustainable livelihood is defined by Chambers and Conway (1991) as follows:

> 'A livelihood comprises people, their capabilities and their means of living, including food, income and assets. Tangible assets are resources and stores, and intangible assets are claims and access.
>
> A livelihood is environmentally sustainable when it maintains or enhances the local and global assets in which livelihoods depend, and has net beneficial effects on other livelihoods. A livelihood is socially sustainable which can cope with and recover from stress and shocks, and provide for future generations.' (Cited in Livelihoods Connect, http://www.livelihoods.org/SLdefn.html)

References:

Center for International Forestry Research. Fact Sheet: Livelihoods.

Website:
http://www.cifor.cgiar.org/Publications/Corporate/FactSheet/livelihood.htm

Livelihoods Connect

Website:
http://www.livelihoods.org

Annex 3: Key Concepts

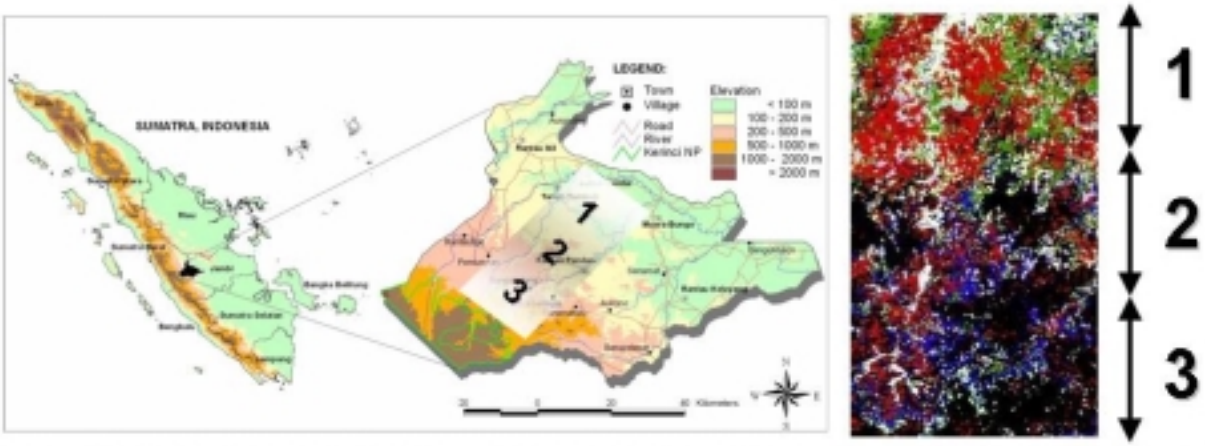
Key Concepts III: Landscape Mosaics

What are landscapes?

- The fundamental traits of a specific geographic area, including its biological composition, physical environment and anthropogenic or social patterns. Forest landscape is a spatial mosaic of arbitrary boundaries containing distinct areas (patches) that functionally interact (Turner 1989).
- A mosaic, where the mix of local ecosystems or land uses is repeated in similar form over a kilometers-wide area. Thus characterized by a repeated cluster of spatial elements (Forman, R.T.T. 1995).
- Landscape embraces geo-ecological relations, spatial patterns, scenic and aesthetical qualities and even social and cultural traditions (Claval 2004).
- Landscape is an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors" (Council of Europe 2000).

What are landscape mosaics?

Looking out from a plane or from the downward perspective you get from looking at a satellite image, the patterns that emerge of the landscapes below resemble a mosaic of tiles; shapes composed of different land types ranging from forests, grassland, wetlands, lakes to agricultural lands and human settlements. Within each of these mosaic elements is a unique ecosystem or land use bordered by another type of land cover. Historically, many of these landscapes were covered with vast tracts of forests, but as human settlements have increased, so have these forests decreased in size as people have taken the forests for timber or agricultural land.



Mosaic of high intensity land use: 1) settlements areas, rice fields, rubber agroforests, 2) rubber agroforests, oil palm, young oil palm, young rubber forests, 3) mosaic of low intensity land use: protected forest, rubber agroforests, rubber forests.

Annex 3: Key Concepts

The patterns that are now emerging for many rural landscapes, especially beyond the safety of protected areas, are characterised by patches of forests, surrounded by plantations, agroforests such as homegardens, farmland and roads. The fragmentation of these forests from large forests to smaller patches has had a significant impact on the survival of many species of plants and animals, however, these patches still have a critical role in the conservation of biodiversity.

Why are they important?

High levels of connectivity, which for example can be described as tree cover with few gaps such as open patches, is important for the survival of many species. Although it is necessary to have areas of forest allocated as protected areas, many species of animals need more forested land area in order to survive. Patches of forests in landscape mosaics can provide this additional habitat and corridors to other protected areas, complementing the conservation efforts within protected areas. In addition, many of these forest patches contain valuable or rare species of plants, which are useful to local communities and valued by conservationists and scientists.

What are we trying to do?

We are trying to engage local communities, district governments and other organisations and institutions to conserve or sustainably use these forest patches and other tree-based systems in order to protect their role as habitat for animals and role in sustaining the livelihoods of local communities.

Annex 3: Key Concepts

Key Concepts IV: Governance

There is widespread recognition that a major problem in the effective and sustainable management of biodiversity (and natural resources in general) derives from poor governance. Bad governance has been identified at all levels, from local to global; and many actors are now working on ways to improve it, through strengthening civil society, attempting to spread democracy, trying to reduce elite capture of benefits from forests, decentralization, and so on.

In this project, we are trying to identify and build on the positive aspects of local management of biodiversity and overcome the negative aspects. Our approach is first to understand how existing systems work (from local to national). We then use action research to first enhance collective action (in communities and districts, respectively) to address local biodiversity issues. We then bring these two levels together to try to forge lasting agreements that will improve biodiversity management at the landscape level.

The following are some of the key concepts that will inform our approach:

- *Power* (the ability to enforce your wishes when opposed---including when your livelihoods are threatened)
- *Voice* (influence in decisionmaking that affects your life)
- *Equity* ('fairness', the degree to which different social groups/categories have access to needed resources/decisionmaking)
- *Authority* (legitimized power)
- *Networking* (sharing information, developing a power base)
- *Policy* (public, formal or informal rules/expectations at various levels)
- *Indicators* (local PAR, cross-site comparison, impact assessment)
- *Visions* (images in minds of people about a desirable future; compilation of alternatives for landscape management)