



Workshop to Launch the CIFOR and ICRAF
Biodiversity Platform
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WORKSHOP REPORT

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All the photos were taken by Trudy O’Connor (cover photo and plates 1,2 and 4) and Piia Koponen (plates 3 and 5).

COVER PHOTO. The damar agroforesters of Krui, Sumatra plant trees for their grandchildren. While they may not see the benefits of harvest in their own lifetimes, the system is a sustainable one that provides stable incomes and protects much more local biodiversity than do intensive agricultural systems.

Summary

This workshop was the launching event of the joint CIFOR-ICRAF Biodiversity Platform. Its objectives were i) to share expertise and experiences to give the Platform a large and solid ground, ii) to get a common understanding of what the Platform should be and where it should go (with targeted outcomes and outputs) and iii) to design the first research project of the Platform.

30 scientists from both institutions joined hands to define common objectives and to discuss the framework and potential operational modes of the Biodiversity Platform. In addition to an interesting and important set of innovative ideas, research questions and gaps, it resulted in an **agreed set of goals, objectives and principles** and **the Biodiversity Platform is now officially launched**. CIFOR and ICRAF committed to include the joint initiative in their respective Medium-Term Plans.

The CIFOR-ICRAF Biodiversity Platform will focus on **biodiversity issues in multifunctional landscape mosaics**. Both institutions intend to take advantage of their perceived objectivity to address issues related to the combination of conservation and development interests. An emphasis is put on local people's perspectives but the guiding principle is to work with multiple stakeholders and at different governance levels. The centres have the staffing capacity to undertake **inter-disciplinary research** encompassing biophysical, socio-economic and policy issues. They can thus rigorously address issues of "people and biodiversity", while also focusing on issues, such as cross-sectoral influences on land use, that are not addressed in many sector-specific research institutions. The Platform wants to:

- Promote dialogue and networking to catalyze the **development of new thinking, approaches, and practice of biodiversity conservation and sustainable use in multifunctional landscapes**.
- Provide **opportunities for:**
 - **Lesson sharing, especially across disciplines, sites and scales.**
 - **Synergies (e.g. of resources, skills, mandates).**
 - **Added value (e.g. through syntheses and generalization).**

The Biodiversity Platform aims to collaboratively deliver international public goods on the following themes:

- Relationships between biodiversity and livelihood security in multifunctional landscapes.
- Ecological processes and spatial dynamics of biodiversity in landscape mosaics.
- Opportunities for and constraints to providing incentives for biodiversity conservation, sustainable use and equitable benefit sharing in landscape mosaics.
- Potential for harmonization of customary and statutory rules and laws in relation to multifunctionality of landscape mosaics.

The first project of the Biodiversity Platform remains to be further developed within this framework. Research activities will follow two models. In a set of benchmark sites, action research will attempt to comprehensively address issues of biodiversity conservation in utilised landscape mosaics. Additionally, other sites will be used

comparatively to test individual theories, ‘fill gaps’ and further strengthen conclusions.

The first day of the workshop aimed at progressing towards a common understanding about the outcomes, outputs and potential research questions of the Biodiversity Platform. The workshop was introduced by Markku Kanninen, Director of Environmental Services and Sustainable Use of Forests programme of CIFOR and Meine van Noordwijk, Regional Coordinator of the South-East Asia ICRAF office (see Annex 3). We also discussed the way “science” may provide targeted information to facilitate multi-scale negotiations. The second day aimed at sharing field experiences and discussion about the first project. The third day, which occurred in a “back to nature” resort, allowed us to go into more depth on selected topics emerging from the previous discussions and to reach a common agreement on the goal and objectives of the Platform.



Plate 1. Pak Kusnadi of Nanggung, in Gunung Halimun area of West Java, Indonesia has a successful nursery. He innovates constantly with the production of various compost types, domestication of local trees and the use of bamboo extracts as growth stimulants.

1. Introduction

The launching workshop of the CIFOR-ICRAF Biodiversity was held in Bogor from 2nd to 5th of March 2006. The objectives of the workshop were to:

- Share our expertise and experiences to give the Platform a solid grounding.
- Get a common understanding of what the Platform should be and where it should go (targeted outcomes and outputs).
- Design the first research project of the Platform.

Approximately 30 scientists from more than 10 countries came to Bogor for the workshop. They shared their opinions on the potential for a closer collaboration on the theme of “Biodiversity in Landscape Mosaics”. Given the early stage of this collaboration and the multidisciplinary audience, the workshop remained a very open working process during 3 days. It required a great deal of work and dedication by all participants. They worked to reach a common understanding of what such a joint Platform might be and on which research themes related to biodiversity conservation, sustainable use and equitable benefit-sharing the institutions could join hands.

This workshop report is divided in four parts:

- The first part summarizes the **goal, objectives and principles of the joint Biodiversity Platform** on which CIFOR and ICRAF representatives reached an agreement during the last meeting day of the workshop.
- The second part reports the **highlights of the discussions and working groups** that dealt with the **general issues of biodiversity in landscape mosaics**, the needed outcomes and some research gaps.
- The third part focuses on the **framework, operational mode and open questions related to the Biodiversity Platform**.
- The final part summarizes **preliminary thoughts on the first project** that the Platform intends to conduct.

In some cases the points presented are those of individual contributors and as such are not necessarily entirely in agreement with each other. Many ideas and potential research topics arose during the workshop. It is not the ambition of the platform to tackle each of them. However, chapter 6 indicates general themes that may be studied within the Platform’s first project.

A glossary defining key terms is provided at the end of the report.

2. Agreement on the framework of the CIFOR-ICRAF Biodiversity Platform

2.1 Preamble¹

Conservation of biodiversity will continue to face major threats and opportunities over the next 15-20 years. Meanwhile, conservation and land use science are also changing the way we think about biodiversity and seek to manage its goods and services. In responding to these challenges, conservation institutions have begun to re-focus and re-organise their efforts. All these changes lead to demand for new types of research. Over the past decades, the pendulum has swung back and forth between ‘conservation based on protected areas’ and ‘conservation in integration with human land use’. In response to the above changes, a new paradigm is emerging that integrates protected areas into broader landscapes of human use and biodiversity conservation, particularly in agricultural areas that now constitute the principal land use in inhabited regions of the developing world.

With the aim of sharing experiences and adding value through increased synergies on biodiversity, CIFOR and ICRAF join hands in a joint **Biodiversity Platform** which focuses on issues related to biodiversity conservation, sustainable use and equitable benefit-sharing in **landscape mosaics**.

As international organisations, mandated for strategic and applied research, CIFOR and ICRAF are well positioned to undertake management-oriented comparative research, analysis and synthesis across countries, regions and institutions. Between them, they cover a full spectrum of terrestrial productive land use systems, and can pull in component and specialist expertise as needed. They provide expertise on the entire spectrum of tropical tree and forest management in the landscape, from scattered trees in crop or grazing land, to closed canopy production forest, to riparian restoration, as well experience in tree improvement research for non-conventional species. The Centres also have access to expertise from other Future Harvest Centres on crop and livestock genetic resources and management.

As organisations mandated to provide input into international policy dialogues, their input is considered legitimate, and they have strong convening power and scientific credibility. They have access to major global players. Their perceived neutrality, even-handedness, and objectivity give their policy analysis additional legitimacy, and position them well to address many conflictive issues.

¹ The preamble is based on the report of an external review of potential collaboration on biodiversity of both centres, better known under the name Matrix matters: Biodiversity research for rural landscape mosaics. Final report. (Cunningham et al. 2003).

The Centres are distinctive in being natural resource institutes whose mandate is poverty reduction, so that they have the staffing capacity to undertake interdisciplinary research encompassing biophysical, social, economic and policy issues. They can thus rigorously address issues of “people and biodiversity”, while also focusing on issues, such as cross-sectoral influences on land use, that are not addressed in many sector-specific research institutions.

2.2 Framework of CIFOR-ICRAF Biodiversity Platform

Based on the objectives of the Matrix Matters Report (2002), CIFOR-ICRAF participants in the launching workshop of the Biodiversity Platform developed a common understanding of the goals and objectives of the Platform. In addition, they decided to give it a set of guiding principles.

Goal

To identify principles, approaches and practices that promote conservation, sustainable use and equitable sharing of biodiversity goods and services in landscape mosaics, through better consideration of and integration with livelihoods and governance issues.

Objectives

In the interests of improved management of multifunctional landscape mosaics for biodiversity conservation, sustainable use and equitable benefit sharing, the Platform’s objectives are:

- a) Stimulate the combination of local knowledge and existing scientific information, to provide new synthetic insights for landscape management.
- b) Provide conceptual and methodological support to landscape studies.
- c) Improve representation of stakeholder interests with an emphasis on local people and understanding of effective incentive structures.
- d) Understand the drivers eroding local biodiversity knowledge and values in order to build upon the motivation, creativity and organizational capabilities of local people.
- e) Influence global and national policies, institutions and corporate behaviour.
- f) Support capacity building and the development of training and resource materials for improved livelihoods and conservation.

Guiding principles

- Biodiversity matters because living things provide goods and services and because it has an intrinsic existence value. These goods and services are increasingly threatened, thus, they must be prioritised.
- Landscape mosaics matter because:
 - Their spatial configuration and dynamics influence viability of biotic populations and provision of environmental services.
 - Land uses of intermediate intensity (utilized forest, agroforest) may provide habitats that are important for biodiversity and other environmental services, especially near forest margins.
 - Protected areas alone are insufficient to conserve all biodiversity and must be considered as part of a wider landscape.
- The Platform will focus on landscape mosaics that satisfy a range of local and external values.
- The Platform will focus on multi-stakeholder governance processes that:
 - Promote stakeholder equity.
 - Consider ethical issues.
 - Manage tradeoffs in time and space with emphasis on local perspectives.
- The Platform promotes honest brokerage between conservation and development interests.
- The Platform will conduct collaborative research using a interdisciplinary and multiple scale approach that adds value to existing knowledge (e.g. through assessment, synthesis, design facilitation, dissemination).
- The Platform promotes dialogue and networking to catalyze the development of new thinking, approaches, and practice on biodiversity conservation and sustainable use in multifunctional landscapes.
- The Platform will provide opportunities for
 - Lesson sharing, especially across disciplines, sites and scales.
 - Synergies (e.g. of resources, skills, mandates, etc.).
 - Added value (e.g. through syntheses and generalization).
 - Funding.
- The Platform is reliant on joint resource mobilization and commitment by participating organizations.

3. Conceptual and Scientific background of the Biodiversity Platform

3.1 Session on policy relevance

An important objective of the workshop was to visualize as a group how the Platform can have meaningful positive impacts for biodiversity conservation and livelihoods. Therefore, the purpose of this session was to identify and discuss elements of relevance in the Platform's focus and agenda. The session included two presentations followed by a time for discussions.

Presentation 1. Conservation of Biodiversity in Landscape Mosaics, Perspectives from “Mainstream” Conservation by Mohamed Bakarr, ICRAF

Mohamed Bakarr emphasized the fact that, over recent decades, the approaches and agendas of conservation NGOs have gradually evolved from a site focus to a broad-scale integrated landscape approach that aims to protect species, maintain connected habitat networks as well as provide local livelihood options. This process relies on dialogue among multiple stakeholders and alliances across disciplines and sectors. Science plays a fundamental role in conservation planning and investment. It helps to understand biodiversity patterns, threats and land uses, and to model the impact of global trends of economic and ecological change on biodiversity. In its interface with mainstream conservation, the proposed Biodiversity Platform will need to clarify whether the research and capacity building it will undertake will seek to promote the integration of biodiversity conservation and local development, or rather to influence key conservation and development groups and advance their understanding on how to more effectively integrate these aspects.

Presentation 2. Biodiversity: Global or local good? by Patricia Shanley and Carol Colfer, CIFOR

Patricia Shanley and Carol Colfer's presentation highlighted the fundamental difference between values of biodiversity by local direct users and external actors as well as the fact that their power systems to access them are generally fundamentally different. Socially acceptable conservation solutions require understanding and respect for how local communities benefit from and contribute to biodiversity. We can 'be on the same team' by:

- Seeking complementarities (e.g. species of local economic and ecological value).
- Recognizing shared threats (e.g. not only on forests but also on local people).
- Sharing scenarios and results of modelling approaches and policy analysis for better land use planning.
- Integrating ecological and socio-economic indicators of thresholds.
- Recognizing and catalyzing local responses that promote system resilience.
- Assessing opportunities and limitations and testing local fit and usefulness of instruments favouring local development and conservation.
- Enhancing the visibility, contribution and evolution of local culture in the use and conservation of nature.

Summary of the discussions on policy relevance

The session raised a rich set of discussion points and questions which have been grouped by sub-themes below.

Target audiences

1. International conservation NGOs

In its interface with international conservation NGOS, the Platform will emphasize the need to integrate livelihoods, to understand the behaviour of people in multifunctional landscape mosaics and how livelihood strategies affect conservation objectives. It will aim to find complementarities between and understand tradeoffs with conservation objectives. The Platform will help to connect these large institutions with local NGOs working on supporting livelihoods in these landscapes.

During the past few decades, thinking in many conservation NGOs has evolved from excluding people from protected areas to involving these people in the conservation process. Yet, sometimes they have been accused of paying only lip service to this process. Conservation NGOs do vary widely in their capacity to implement landscape approaches that take into account local livelihoods, and thus broad generalisations are likely to be inadequate. However, there tends to be a negative perception of their approach by the development and scientific community. A change in that perception is needed to allow for collaboration between science and conservation on common ground. The main constraints they experience include:

- Lack of models, methodologies, tools and information to apply landscape approaches that include people.
- Lack of disciplinary diversity and combinations limiting their perspectives.
- Power imbalances between stakeholders. Despite good intentions, knowledge and skills of how to reach common grounds and tradeoffs remain limited.

2. National and regional governments

Rather than direct tools for conservation only, we should find indirect levers which connect better to government priorities, such as water quality or public health and justify conservation from their perspectives.

3. Corporate businesses

The Biodiversity Platform should also seek to influence the agenda of corporate businesses. Impact might be made through the development of collaborative efforts between corporate businesses and conservation organizations. For instance, associating several large logging companies in Central Africa with sustainable wildlife management efforts of national and international conservation agencies can contribute significantly to biodiversity conservation in this region. While such collaboration has not been traditionally sought within the two institutes, it would be worthwhile to consider it in the Biodiversity Platform.

What is our role in public policy creation?

- Biodiversity Platform has the potential role as a broker of knowledge, enabling science to inform policy and linking decision makers with local people. We can provide informed predictions of the likely outcomes of various management options. Such scenarios may be useful tools for communication in the resource-use brokering process.
- There is a need to analyze where knowledge is limiting and where sufficient knowledge exists but organizations are not yet putting it into practice. A number of partner organizations work at larger scales than CIFOR and ICRAF and thus can reach higher scales of impact than both institutes could do by themselves. Therefore, the Platform should contribute to further development and dissemination of multi-scale landscape methods and influence such larger organizations, such as conservation NGOs, to adapt these methods in the near term.

Visioning the focus and role of the Platform

Landscape and scale

- What do we mean by landscape? Does a landscape approach necessarily imply a large geographical area? How feasible is it to manage an entire landscape at once?
- Matrix matters points to landscape units of 100 ha to 10,000 ha. A landscape should be what is practical and realistic from a management point of view. To 'qualify' as a landscape an area must have multiple dimensions rather than just one land use type.
- Definition of scale is political. What is visible and invisible is scale dependent. What appears on a global level map in red and green has many different elements at local level. What is constraining at local level may not be so at global level.
- What is the purpose of making visible what used to be invisible? Visibility can have important uses. Visibility also carries risk. From the local people's perspectives, when do they want to be visible or ignored and for what purpose?
- What are the scales of the metapopulations we are conserving and what are the scales of the major threats to these. It is impossible to define what landscape is for all cases, but we can define what we need to look at in order to make that specific definition for an individual place.

Hotspot / Protected Area versus landscape mosaics

- Hotspots have high conservation value to the outside world. Human density in these hotspots can be high or low. Some areas such as the Sahel may not have a high conservation value, yet they host a large number of poor and are important from a CGIAR (Consultative Group on International Agricultural Research) or people-centred perspective. How much emphasis will the Biodiversity Platform give to this distinction?
- The Platform should primarily focus on the proportion of land that falls outside protected area land, as it has a major role to play in biodiversity conservation.
- Don't rule out protected areas. Even though they may be protected on paper, many are not protected on the ground.

Integrating customary and statutory law

- Need a better focus on the interface between statutory and customary law.

Science for a democratic negotiation process between local and global interests in biodiversity

- Role of science in bridging the interface between local and global interests. Need to emphasize negotiation process between both levels.
- The Platform can add value in the negotiation process by bringing in disciplines that are not generally involved. For instance, it should focus on biodiversity valuation studies that could inform multiple actors about who benefits, who pays and who should be compensated in conservation planning.
- Platform should develop the research agenda required to make the process of natural resource negotiation more democratic.
- Interface between local and scientific knowledge. What is the effect if you leave out of the equation either scientific knowledge or local knowledge, or what is the effect if you integrate both, in terms of negotiations with policy makers and biodiversity outcomes on the ground?
- Agendas of NGOs (Non Governmental Organizations) lack legitimacy in local or non-western contexts. How can more democratic processes be fostered so that motivation for conservation action is really rooted in local and national contexts in terms of what really matters to people on the ground?
- The appropriateness of science products in negotiation depends on the stakeholders present. For instance, CBD (Convention on Biological Diversity) and national-level land use planning require different negotiation Platforms and levels of interventions.
- Alliances between indigenous people and conservation organizations are only effective when we deal with property rights, and prior informed consent is obtained. This is often difficult in the context of compensatory payments.
- Landscape-level interventions do not necessarily correspond to the scale of policy making. Degradation of ecosystems is the result of a mismatch between level of decision making and the resource system being managed. Both require a different way of delivery of the knowledge coming from research.

Tradeoffs and rewards

- Very different value systems need to be recognized. They will change according to different countries, communities, etc. Generally, there are no win-win situations but rather tradeoffs.
- Thus, we need to look at conditions and characteristics of reward systems because multi-stakeholder approaches require tradeoffs.
- Win-win versus tradeoffs. There are win-win situations that we do not build on. We should identify and build on them. Particularly, a number of win-win situations are closely tied to cultural issues.
- Under what context, what conditions does conservation work? Win-wins are possible in some places; elsewhere they are not. Need to understand formal versus customary legal systems, and incentive structures to influence behaviour of actors. Tradeoffs might be manifested at different levels. Need to understand linkages between actors, who the Platform seeks to influence, also how local perspectives are different from perspectives at global level.

Cultural aspects

- Cultural aspects are underrepresented. They need a stronger place in research.
- In rural areas, the cultural context of biodiversity and management is very important. There are many important aspects of biodiversity, other than purely money, that matter to people.

Loss of local knowledge

- There is an alarming loss of local knowledge. Need for capacity building with local groups linking generations, including local schools, on local ecological knowledge. Need to work with local languages that are often overlooked.

Invisible species

- Invisible species need documenting. Which species are invisible?
- Which species are invisible to whom? Are there species visible to local people, but not to conservation agencies and society? Does the importance placed on species that are significant to external actors compromise emphasis on other species? Conservation prioritizes highly visible ‘sexy’ species at the expense of others. The CGIAR is organized around a few dominant crops only.
- What are the implications of invisible species to local people, to society, and to all actors?
- Is it good to make them visible or not? What are the implications of greater visibility for biodiversity conservation? Does it lead to conservation or do invisible species become more threatened? Document the effect of an institutionalized emphasis on few priority species to raise awareness. Is the ‘flagship species’ approach effective? Does it have spin-off effects?

3.2 Session on “credible science”

The session began with presentations of different tools and approaches used for biodiversity research by the two centres. We focused on conceptual and methodological aspects. Scientists shared information on their disciplinary expertise and corresponding tools and approaches. They discussed differences between them and the way to combine them with regard to a joint approach to tackle biodiversity issues. Research gaps, or more precisely, needs to adapt the current approaches were highlighted during the main discussion and working groups.

Presentation 1. **Ecology of mosaic landscapes** by Meine van Noordwijk, ICRAF

Meine van Noordwijk emphasized scientific issues related to advancing our understanding of the “tree of life”, of the ecological role of landscape patterns as well as applied opportunities for recognizing local people’s influence on conservation.

Mosaic of knowledge

- Most of the world’s biodiversity still is unknown and may disappear before it is recognized.
 - There are many invisible living things and unknown processes in the tree of life – what do we really know?
 - Rare species are numerous but difficult to survey, what is their ecology and what are the threats or advantages of being rare?
- Based on limited surveys, we could try to infer conclusions on rare species (meta-community theory).

Mosaic of habitats

- Understanding successional *processes* is crucial especially in intermediate-intensity land-use system: combine spatial analysis with critical biological features (dispersal modes, life history traits).
- *Patterns*: we can take advantage of modern analytical tools for capturing the influence of “grey scale” patches on ecological connectivity.

Mosaics of threats

- Need to understand multi-scale systems of resource access and exploitation.
- Need for multidisciplinary approaches combining history, anthropology, economics and ecology.
- Clarifying the link between threats and domestication initiatives.

Mosaics of opportunities

- Opportunities through better recognition of local uses and appreciation of organisms.
- Opportunities through reward mechanisms – need of clear monitoring and associated conditionalities.

Presentation 2. **Rewards for biodiversity conservation** by Brent Swallow, ICRAF

Brent Swallow presented first some of his expectations of the Biodiversity Platform:

- We will not focus on justifying national and international level concerns and investments on biodiversity habitats, not valuation *of its own sake* and not redoing the work of CI on overall conservation investments.
- Instead, we will focus on Multi Use Landscapes (or Multifunctional landscapes) and watersheds across the developing world, situations where decisions on land use practices of small scale farmers have clear impact or where there is a clear threat to biodiversity.
- We will assist the targeted design and implementation mechanisms, coupled with socially acceptable tradeoffs between biodiversity and livelihoods.

After which he proposed the following priorities:

- 1) Where and what are the mechanisms?
- 2) Working models of successful landscape management.
- 3) Extending our work on tradeoffs and model-based predictions.
- 4) Finding ways to harmonize negotiations and governance work of both institutions.

Presentation 3. **Payment for environmental services.** Brian Belcher and Sven Wunder, CIFOR

Brian Belcher presented on behalf of Sven Wunder, specialist in PES (payments for environmental services). He highlighted the potential of synergies between different environmental services and described the on-going research framework of CIFOR and partners.

- PES are voluntary, contingent transactions around well-defined environmental services, including at least one buyer and one seller.
- PES can provide innovative financing sources for biodiversity (especially from the private sector).
- At a landscape level, the combination of different services (biodiversity *and* water, carbon, recreation) can yield synergies and sometimes tradeoffs.
- CIFOR has a multidisciplinary team focusing on PES in Latin America (Bolivia, Ecuador, Colombia, Costa-Rica and Venezuela) and in Asia (Indonesia and Vietnam) with local and international partners, such as Forest Trends, International Institute for Environment and Development (IIED) and CI (Conservation International).

Presentation 4. **Integrated natural resource management.** Bruce Campbell, CIFOR

Bruce Campbell first highlighted open questions related to “what is credible science” and focused on the need to link research to action and of tracking development and conservation outcomes to better design research from the ground realities.

- 1) Tradeoffs are more a rule than an exception.
- 2) Conservation and development are not easy to integrate, there is general scepticism against this as in the end livelihoods may be short-changed by interventions.

- 3) Integrated natural resource management and action research approaches are already embedded in many agendas of different NGOs and organizations under other synonyms.
- 4) Key elements are: more attention to organizational and institutional perspectives, multiple scales of analysis and intervention, facilitation (getting into the system) and local organizational capacities.
- 5) On the ground, so-called conservation and development landscapes could lead to major thrusts. Examples can be Malinau (Kalimantan, Indonesia), Cameroon, Guinean highlands (collaboration with ICRAF), Mekong region, etc. Key elements should be “doing *effective* research” and “tracking outcomes”.
- 6) Tools (*participatory* selection of indicators, data collection and analysis and modelling) must be derived from action.



Plate 2. Lasimin, a Sumberjaya farmer shows one of the many thousands of forest tree seedlings planted by local farmer groups as part of the local community forestry program. Farmer groups have made arrangements with local government that provide them with medium term tenure in return for landscape stewardship.

Summary of discussions on “credible science”

After presentations, working groups continued brainstorming on the possible relationships between the ideally expected outcomes and on how science could contribute to promoting or achieve them. While discussing about potential knowledge gaps, participants first focused on the question “whose gaps are we addressing?”. The definition of target audiences (i.e. research community, local, national government or other stakeholders in the conservation world) is a critical dimension in the proposed mandate of the Platform. These various groups currently have unequal access and to (possibly unequal interest in) biodiversity-related information.

Discussions brought out very diverse elements, some focusing on underrepresented disciplines while others explored ways of influencing different audiences and scales within our research. Generally speaking, the Biodiversity Platform aims at conducting multi-scale and multi-disciplinary research in order to reach both the scientific community and various other stakeholders. Main points and questions of the discussions have been grouped by subthemes.

How do we want to approach biodiversity in joint research activities?

How to be credible for science and for different target audience?

Credibility depends on who we are talking to; for policymakers it may not matter that much how technically credible we are, but that we are addressing questions, which are important for them. While we have the role of providing new information to the discussions, relevance is determined by the demand from end-users. Thus, we highlight the importance of adaptive action research as an overall approach for the Platform.

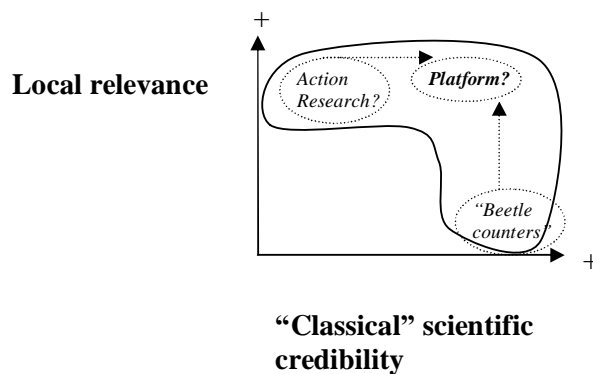


Figure 1. A conceptual representation of two dimensions of credibility (credible by / for whom?) showing how the Biodiversity Platform can combine optimally the technical credibility (measured e.g. by scientific publications) and the locally more development-oriented relevance.

Biodiversity in landscape mosaics: the ecological basis and open questions

To achieve a sustainable multi-functional landscape, we need to better understand:

- The role and influence of spatial patterns on biodiversity in forest ecosystems.
- Landscape-level mechanisms of source-sink links and operations of meta-population concepts.
- How the exploited species use habitats in dynamic landscapes.
- While conserving visible species, we lack the knowledge of whether this indeed leads to conservation of invisible species. We need to document case studies.
- What is the relationship between watershed functions and biodiversity conservation in forest ecosystems?
- How to best restore habitats and species populations.
- The role of participatory tree domestication in livelihood diversification.



Plate 3. Typical landscape mosaic of rice paddies and agroforests close to the Gunung Halimun ("Misty Mountain") National Park in West Java, Indonesia. Workshop field trip participants saw how ICRAF works close to the park, with themes such as tree garden productivity enhancement and 'tree nurseries of excellence'.

When addressing questions regarding biodiversity in landscapes, we have to develop a standardized way to characterize biodiversity across study sites in dynamic landscapes (under threat).

- Tree of life is too complex and there are too many organisms to determine or study in details. According to many studies, the best available indicators for biodiversity are trees (woody perennials). We should explore further whether trees are best indicators of biodiversity also in human-dominated landscapes.
- Start with the analysis of the (external) biodiversity values of different land use types, and then move to landscape scales to integrate them.

Prioritizing integration of conservation and development

This point was raised many times during discussions throughout the workshop and it was seen as one of the major challenges (as well as an opportunity) for the Platform. Improved methodologies to achieve integrated conservation and development are needed. First of all, by synthesizing, why, when and what type of various integrated research efforts have been successful, we may find solutions and be able to draw wider lessons from win-win situations. They may include better ways for local people to make money from conservation areas and ways to conserve biodiversity in productive areas. To be objective, failures (lose-lose) or intermediate compromises (win-lose) will also provide lessons learnt. Another perspective to the matter was given by indicating, that even if researchers may have sufficient knowledge on how the combination of conservation and development could theoretically work, difficulty lies in convincing people to do it. In other words:

- We need to develop better tools for implementation of integrated conservation with development goals to achieve concrete results.
- New methodologies (such as more people-focused land use plans) are not automatically adapted. Therefore we need better dissemination strategies to influence conservation and development agencies as well as policy makers.

Recognizing local perceptions

Conventionally, local perceptions are included once biodiversity priorities have already been defined scientifically. This often implies that biodiversity outcomes take priority and local benefits become secondary. A new paradigm that consists in complementing scientific approaches with local perceptions from the very beginning is needed. As it provides a means for local perceptions to be included, partners in other sectors such as water, health, education, culture may find it attractive to co-invest in the process. In addition, we are losing local knowledge and local languages due to globalization. To tackle this problem, we recognize the importance of building capacity and “linking generations”.

Recognizing the social sciences’ role in biodiversity conservation

As any effective conservation process would essentially depend on local people’s perspectives, one needs to understand them and thus to better incorporate social science into biodiversity and development issues. When we work with communities through action research in the context of improving equity, there are emerging local demands that represent opportunities to link the research with issues other than forestry or biodiversity, e.g. with reproductive health issues. Cultural aspects of conservation and development integration are understudied. To be able to draw general conclusions, we need to define a wide variety of sites and understand the significance of culture in every site.

Scaling up to landscape level

Local perceptions are important as a basis but not sufficient to ensure success. The process has to be multi-stakeholder and multi-scale to be relevant beyond local conditions and to attract other sectors. We need to clarify at what scales in landscapes we want or need to work. The goal is to look at wider landscapes rather than only to focus on buffer zones without taking into account protected areas or only on areas disconnected from conservation areas. More studies on gradients ranging from peri-urban to forest conditions are needed. When farmers are faced with environmental changes they are innovative in their response. We need to find new ways to scale up from site-specific solutions and results to lessons applicable widely.

Action research approaches for facilitating fairly negotiated compromises.

Societal consensus (common motivation) of change is needed as well as a more democratic process. We may improve this through:

- Including a democratic process in our projects and research topics.
- Investigating how multi-stakeholder meetings or approaches are facilitated. Approaches in i.e. ACM (Adaptive Collaborative Management) and INRM (Integrated Natural Resource Management) are quite similar but initial questions are different. Can the initial questions, or the fact that one starts looking at win-wins or at tradeoffs cause bias to the process and results?
- To be able to draw generalizations or wider conclusions through action research, we have to better identify factors associated with success and failures.

Local – global governance

In order to enhance equity and efficiency in decision-making processes and achieve full recognition and inclusion of local priorities within external conservation interests, we need to:

- Improve strategies to recognize and approaches to validate local expertise in order to make it more appealing and credible for decision makers. For instance, forest plans developed by local communities are often rejected by government agencies.
- Understand better local values of species and habitat as drivers of conservation.
- Improve understanding of the role and benefits of biodiversity in multifunctional landscape management and promote institutionalization of the multifunctional landscape approach.
- Develop tools to build vision among all stakeholders of what biodiversity in landscape mosaics management should be.
- Give and develop negotiation support through tools such as cost-benefit analysis, tradeoff analysis, win-win scenarios, models of conservation.
- Strengthen local governance.

To establish a shared vision among all stakeholders of what biodiversity in landscape mosaics management should be, we need to:

- Develop scenarios and mechanisms to integrate livelihood priorities and options with conservation.
- Improve skills and raise interest among people in several landscapes to manage biodiversity more effectively (sustainably) and draw lessons from the experience.

In order to make the biodiversity conservation more appealing and understandable for policy makers, we need to:

- Find ways to recognize the role of forest/biodiversity in poverty reduction and conservation in multifunctional landscapes.
- Do demand-driven action-research with local policy makers (stakeholders).
- Develop better tools for communicating biodiversity objectives i.e. by relating biodiversity with health, population water, other issues 'more relevant' to policy makers.

- Improve reward mechanisms and incentive systems through:
 - Generating data for PES assessments.
 - Improving stewardship, corporate social responsibility and certification.
 - Researching compensation systems.

Where market access is leading to over-extraction, incentive or reward systems may not be the only instruments but strategies to strengthen local governance (negotiation, rules and legislation) are also needed.



Plate 4. ICRAF staff Laura German, Jean-Marc Boffa and Aunul Fauzi discuss coffee garden maintenance with farmers in Sumberjaya, Sumatra.

4. Platform agenda and potential outputs

4.1 Defining the Platform's role, agenda and activities

We need to select priorities for the Platform carefully, based on the policy relevance we want to maintain and on centres' scientific mandates. Their poverty alleviation focus leads us to emphasize the utilitarian value of biodiversity, but in order to combine development and conservation objectives, one cannot totally set aside important ethical questions such as “non use”² of biodiversity. This was debated and discussions reflected the fact that positions may be subjective and very personal. Nevertheless, if the Platform will work with and among different stakeholder groups, part of its mandate is to understand how biodiversity perceptions differ.

When defining the Platform's planned agenda and activities, it is important to identify where it will add to activities already conducted by existing institutions. One critical element in the Platform and its relevance is the relationship between science and networking roles (mobilizing our science and global reach to give greater weight in policy on biodiversity as well as on local people and their perspectives). Defining distinctive characteristics of ICRAF and CIFOR will be helpful to better know both what is *useful* as well as what is *practical* in this partnership. These unique elements include the ability to make comparative studies and analyses across sites and thus across scales, as well as taking a multi-stakeholder focus.

One challenge we face is to bring together our complex ‘puzzle’ of activities. The Platform should add value and bring coherence to these diverse and heterogeneous research activities, as well as to staff and partners implementing them. There should be a clear intellectual incentive for scientists to actively join the Platform. One suggested way of securing people's interest and involvement is by defining an ambitious goal, such as to “identify shared visions which promote synergies between local and broader conservation objectives in multifunctional landscapes” (see Part one for the agreed set of goal and objectives).

Some suggestions regarding the role of the Platform in creating useful information and adding value to what is already available:

- Science:
 - Gap filling by additional field research and better use of under-utilized data.
 - Biodiversity characterization across study sites in dynamic landscapes (under threat).
 - Cost-benefit analyses of tradeoffs, in win-win – lose-less situations.
 - Scientific and other publications for the Convention on Biological Diversity, donors.

² Some frequently recognized types of ‘non-use’ values include ‘existence’ values (valuing something regardless of whether one ever sees or uses it), ‘bequest’ values (valuing something because of its known usefulness for future generations) and ‘option’ values (potential, but as yet unknown value of something in the future). (<http://cnx.org/content/m12170/latest>)

- Information sharing, synthesis:
 - Synthesis of information/databases.
 - Clearinghouse mechanisms³ for sharing existing research findings.
- Empowerment, capacity building:
 - Publications and products directed at local audiences, practical management guidelines for improved understanding.

4.2 Open questions and potential outputs

The identification of broad identity and goals, objectives and desired outcomes of the Platform allows for planning of Platform activities. Yet the following points remain unanswered.

- At a theoretical level:
 - How do we define “the needed better outcome”, and the corresponding “better multifunctional landscape?”
 - When it is defined, how do we help progress towards such a better landscape?
- At a more practical level:
 - What balance is sought between synthesis of past research and new research?

It seems likely that this last question will only be answered when a better knowledge of the “puzzle of activities”, e.g. the relevant existing results and sites’ data are collected.

Potential outputs

In order to make the Platform’s science useful and available to relevant audiences, the Platform has the potential to produce ‘outputs’ of several types. These outputs are broadly grouped by the audience at which they are aimed. Both the nature and location of the audience must be considered, for example, lay person or scientist; local, regional or global. It was suggested that the Platform could have something of a ‘clearinghouse mechanism’ on biodiversity and livelihoods in multifunctional landscapes, providing a comprehensive store of information on these topics for the public.

³ See the clearinghouse related to CBD: <http://www.biodiv.org/chm/default.aspx>

The following potential outputs were mentioned during the plenary session:

Local level

- Products useful for people: local and policy-makers (mainly national) based on integrated knowledge (LEK + PEK + MEK⁴) in formats that are appealing to them.
- Characterization of ‘cultural’ values of biodiversity (and the unique ecosystems in which they are embedded) for local and non-local stakeholders in selected pilot sites and their corresponding landscapes.
- Management guideline book directed to local people, translated in (local) ethnic languages based on results. (Not another Multi-stakeholder general audience book but a resource specifically for local people). Could be examples of how other communities managed to maintain traditional practices and local guide to use and manage scientific results.
- Training modules for local stakeholders in biodiversity conservation and management, modules on communication at multiple scales.
- Materials for communities explaining the external value of the biodiversity they look after and means by which they might get help to do this and gain further benefits by their stewardship.
- Tools and incentive schemes for local communities for biodiversity in multifunctional landscape management.

Global/ regional outputs

- A multidisciplinary landscape typology and better understanding of the influence of different landscape configurations.
- Evaluation of landscape changes – How do the multiple functions affect the resulting landscape?
- ‘Biodiversity conservation: Local people’s perspectives’ – a hard hitting document which uses sites to analyze how complementarities of conservation and livelihoods can be achieved.

Topics and format of possible scientific publications

- Scientific publications to support multi-stakeholder management of landscape mosaics.
- Existing (tree) biodiversity characterized and quantified for pilot site(s).
- A comprehensive common database on biodiversity coming from the various research activities of the centres, available and accessible to all through the internet.
- Strategic documents targeted at CBD/COP (Conference of the parties) synthesizing key findings.

⁴ Public, Modelers’ and Local Ecological Knowledge

5. The Platform's Communication and Partnerships – Why, How, When and with Whom?

Partnerships may be established for different reasons, i.e. 1) there is a planned activity for which we want to have adequate partners or 2) we want to work with a given partner and we develop the activity together. In general, it is considered beneficial to communicate with local and national level partners. Some situations, when national institutions have not been well connected to local levels, teach caution. Local NGOs in particular appreciate capacity building, which may be seen as an incentive for them to join the Platform and work with us.

5.1 Partnerships

Both centres have had many partnerships arrangements and the lessons from those in a nutshell might be, that the most important aspects to keep up a functioning partnership are to maintain 1) trust, 2) confidence and 3) consistency in philosophy. Functioning partnerships are not just who we (want to) work with, but how and where.

To improve the CIFOR – ICRAF partnership, we could:

- Develop models and principles for the ways we work together and with our partners.
 - Establish procedures in budgeting.
 - Develop principles on how new initiatives will be created and communicated, looking at comparative advantage of match making.
 - Find ways to make communication more easily and efficiently
 - Clarify expectations, i.e. research ownership and accountability (publication ethics).
- Be even more transparent.
- Match interests on topical areas between scientists in both organizations. This way we can achieve commitment by individuals.
- Recognize that personal level contacts are critical.
- Learn from existing arrangements between CIFOR – ICRAF, such as:
 - CAPRI (Collective action to secure property rights for the poor; CIFOR, ICRAF and IFPRI are the main partners)
 - ASB (Alternatives for Slash and Burn; CIFOR currently chairs ASB steering committee, ICRAF hosts ASB secretariat).
 - In Guinea, a formal collaboration through shared project is starting between CIFOR and ICRAF.
- Engaging students: for successful work with students e.g. model from Poverty Environment -network.

The Platform will need to clarify its purpose of collaboration with each of the following categories of partners and develop principles and strategy to go about it:

- International development agencies and NGOs
- International conservation agencies and NGOs
- Advanced research institutions
- Academic institutions (universities, colleges, etc)
- National-level government agencies, institutions and NGOs
- Local-level communities, NGOs and governments
- Corporate partners
- Donors
- Others

How does the CIFOR – ICRAF relationship fit with links with other NGOs?

So far relationships with NGOs have been seen as being mostly project or location oriented, and both CGIAR organizations have a multiplicity of existing memoranda of understanding. The key global partners of CIFOR and ICRAF are somewhat different. While ICRAF is closest to CI and The World Conservation Union (IUCN), CIFOR works closely with Centre de coopération internationale en recherche agronomique pour le développement (CIRAD), The Nature Conservancy (TNC), World Wildlife Fund (WWF) and Tropenbos. Especially at national and local level it is almost impossible to list all our partners because of their large number and site or country specificity. Both organizations would benefit from better partnering with universities.

5.2 Communications

Our aim is to have an “Open space”, a communication Platform for biodiversity research, for us and for others and to add value to existing research of both centres.

- An internet site could be the main communication mechanism:
 - There are missed opportunities to link people. A clearinghouse type of approach through a website could be possible. Although a website does not reach everyone, it is a powerful way to reach donors, share information between partners and in general communicate with the rest of the world.
 - Newsletters may be an alternative to an internet site for those areas without internet connection.
- ‘Policy Briefs’ as a model for more formal information sharing.
- Personal meetings are valuable ways to engage people, as well as sharing specific work activities together (e.g. common writing workshops).

Practical next steps related to communication after the workshop:

- Develop internet page with the main hypotheses and approach to attract donors and interested partners.
- Publish a brochure/leaflet presenting the Biodiversity Platform as soon as possible:
 - To reach an audience beyond Southeast Asia.
 - To enhance the institutionalization of the Platform.
 - To inform donors and potential partners.

- Publish a scientific paper that provides a state of the art review of the concepts and practices for multifunctional management of tropical landscape mosaics for biodiversity conservation at multiple scales as intended by the Platform. This builds on the Matrix matters report and could take the format of a CIFOR-ICRAF occasional paper. It will include lessons learned from field locations (case studies like those presented in the workshop) and emphasize the need for new ways of doing research.



Plate 5. Personal meetings were perceived by the workshop participants as the most important means to communicate.

6. Guiding hypotheses and approach for the “landscape mosaics” project

6.1 *The basis: project outline*

Having in mind the broader discussion held on the Platform’s outcomes and examples of research methods and field experiences, participants discussed research hypotheses that could fit into the rough outline discussed between ICRAF, CIFOR and the Swiss Agency for Development and Cooperation (SDC) representatives in October 2005. The outline is the following:

Landscape mosaics: tools for integrating management and biodiversity conservation in tropical landscapes

Purpose:

Match appropriate management and biodiversity conservation instruments for tropical landscape mosaics to the scales at which external conservation objectives can be combined with local resource use objectives.

Steps:

1. Assemble a pantropical set of sites with clear external biodiversity value and ongoing action research on the conservation/development interface (including active and past forest margins).
- 2A. Characterize the landscape mosaic from a human use as well as a biodiversity perspective in a standardized way, to allow cross-site comparisons.
- 2B. Characterize biodiversity perspectives of local communities, local and national government bodies, private sector and external conservation stakeholders
- 2C. Summarize location-specific lessons about instruments that are being used and tested.
- 3A. Synthesize data as regards the scale-related tradeoffs involved in local land use decisions.
- 3B. Synthesize the data as regards ‘habitat loss’ or ‘overexploitation’ as main scale-related threats to biodiversity.
4. Adapt and develop (multi-scale) tools and recommendations for combining conservation, management and development.

Two working groups were formed in the workshop and they worked during two consecutive sessions. The first session brought some preliminary results and many interesting ideas but it was decided to continue the work in the same groups to further focus hypotheses.

6.2 Guiding thematic research hypotheses

We entitled this section ‘Guiding thematic research hypotheses’ because the following reflection is still too general to be directly translated into research hypotheses for the discussed project. In what follows, much material deals with the Platform framework (in the longer term) in addition to what will be feasible for a single project. However, such general themes and hypotheses will be useful to guide further works on the project design.

The core elements of the project outline are:

- Biodiversity in landscape mosaics: spatial patterns and ecological processes.
- Stakeholders and objectives: external conservation objectives compared to local resource use.
- Instruments and scales: incentives (rewards and payments) and regulations (customary/statutory).

Within these core elements there are main thematic areas: **landscape ecology**, **governance**, including local rules as well as incentive mechanisms and other “instruments” for rewarding conservation services, **livelihoods** (especially with regard to the Platform’s principle of emphasizing local people’s perspectives)

After the first session, there was a multiplicity of hypotheses and potential research questions. Based on the results of the first working group, the following 4 research hypotheses seem to have captured the most important thematic interests of the participants. At this stage, they may be used as “guiding” hypotheses. They are closely related to the above-mentioned thematic areas:

Biodiversity and livelihoods

1. Timely empowerment of local people through integration of scientific and local knowledge and understanding of thresholds of livelihood-related products and services will mitigate biodiversity loss and maintain/increase livelihood security.

Biodiversity in customary and public policies

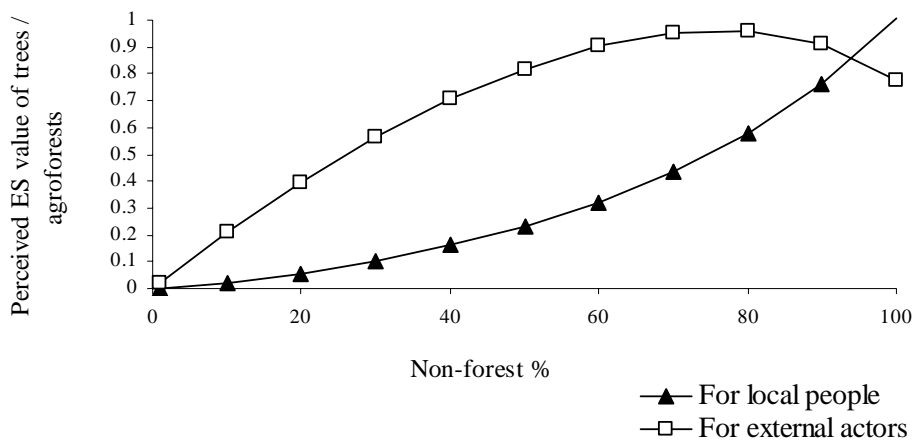
2. Overall landscape sustainability (or performance, resilience measured through indicators; land-use intensity, patterns, tree/forest diversity) is enhanced when public policies are informed by and allow for customary / local rules and practices.

Incentives for biodiversity conservation

3. Incentives (payments and other types of rewards) for biodiversity conservation in landscape mosaics will only work where:
 - The external values of conservation are considered as higher than known and recognized local values and needs of biodiversity products and services (forest conversion/ harvest/ hunting/ tradition).
 - Local regulations and organization, based on a local valuation of biodiversity products and services, effectively constrain individual decisions.
 - External commitment is serious and follows up on promises made.
 - A collaborative monitoring process ensures trust between stakeholders.

Biodiversity in landscape mosaics

4. External conservation values and local values of biodiversity goods and services vary non-linearly in time depending on the *landscape mosaic and overall intensity of land uses*. One can identify a maximum of external interest related to declining forest cover in landscape mosaics after which they will continuously decrease (see graph 1).
 - In forest-derived mosaics, the external conservation value of the area of “intermediate” intensity land use increases more than proportionally to the decrease of forest cover, up to X % of forest cover, where X depends on mosaic configuration.
 - In forest derived mosaics, the local Environmental Services (ES) relevance to the area of intermediate land use increases more than proportionally without threshold.
 - The contrast between local and external conservation value thus depends on forest cover.



Graph 1.

Hypothesis of the way the externally as well as locally perceived biodiversity values of agroforestry depends on landscape-scale forest cover. (A simple model is available on request.)

6.3 A look at a potential multidisciplinary “project approach” for integrating management and biodiversity conservation in landscapes mosaics

The steps defined in the project outline start with a multidisciplinary and multi-scale biodiversity and human use characterization and end with an analysis of appropriate instruments to combine local and external objectives, if needed at multiple scales. The second working group worked using this approach rather than directly “by hypotheses”. They identified elements which form an “organizing framework” and which correspond to methodological issues which are listed below.

In this sub-chapter there are more open questions than the methodological action research of the project will be able to answer, but it is useful to consider them all here.

Steps and methodological issues:

A. Recognizing the desirability of states and the possible pathways / transitions between the states:

- How should we define what is desirable? How much characterization of the system is needed to effectively manage biodiversity outcomes?
- How should we define the scales of the analyzed system? According to biodiversity threats?
- What dimensions of the landscape are subject to thresholds (for targeting management and instruments)? What are key thresholds in the relationships between biodiversity states?
- What are effective methods for identifying and managing “critical uncertainties” relevant to different management options?

B. Identifying and understanding how the context (factors outside of the reach of the mechanisms that are put in place) **affects the states.**

B1. Factors that are relatively time invariant and certain.

B2. Dynamic and uncertain factors or driving forces or threats.

- Are there external driving forces that rule out change through particular mechanisms and state transitions?
- Can key relationships between livelihoods and biodiversity be organized into the food system (e.g. local dependence on wild foods in stress times, harvesting of bush meat, etc), health system (ecosystem threats to health, disease epidemiology, medicinal plants), governance system (decentralization of responsibility for landscape management) and land use?

C. Identifying the mechanisms for achieving transitions towards more desirable states and implementing mechanisms, the approaches for moving to “more desirable states”.

C1. Identification includes various combinations of externally-motivated mechanisms such as regulations, investments, rewards for ecosystem services, and empowerment, rights to resources and support for local organization. It also includes design principles for identifying combinations of the mechanisms that might be most appropriate in different circumstances.

- What are effective methods for understanding where local interests intersect with conservation interests at different scales? [Typology of interactions].
- Can the framing of the approach in terms of win-wins vs. tradeoffs influence outcomes?
- Will a better consideration of the links between biodiversity and livelihoods that are mediated through health, food systems and water quality foster better links between biodiversity conservation and other development processes (e.g. poverty reduction strategies)?
- What thresholds exist in stakeholder interest? How can the concept of thresholds help to manage conflict/negotiation?
- What are effective methods for determining the most appropriate scale for mechanisms?
- Are critical economic / governance indicators subject to thresholds or linear relationships? What is the effect of these underlying properties on negotiation support systems? Opportunities for harmonizing conservation and livelihood goals?
- What are the tradeoffs among different land management scenarios? (Quantify gains and losses for different stakeholders.)
- Will integration of incentive and regulatory mechanisms foster more 'win-wins' [create more 'wins' for more stakeholders] than their application in isolation?
- Will integration of biodiversity with other environmental services (that might be of higher local value than biodiversity) enable 'win-wins' in multi-functional landscapes?

C2. "Implementation processes" (potential processes by which the mechanisms are put in place).

- Can the institutionalizing processes of social learning contribute to biodiversity goals (as local people come to better appreciate their own expertise, the value that they get from their biodiversity resources and their increasing ability to deal with external threats to local biodiversity)?
- Are rewards delivered by external stakeholders through a given instruments sufficient to support or shift management to achieve specific biodiversity targets?

6.3 “Post-workshop” comments

In principle, the different results of the working groups - the first one working by thematic hypotheses and the second one working by an ‘action research approach’ - could be combined within this first project of the Platform. First of all, through thematic syntheses of research findings and applied experiences, the guiding hypotheses could lead to high-level research outputs on crucial topics such as *biodiversity and livelihoods*, *biodiversity in customary and public policies*, *incentives for biodiversity conservation* and finally *biodiversity in landscape mosaics*. A first “axis of intervention” of the project could be to facilitate the information sharing within and between CIFOR and ICRAF according to research findings and site experiences related to these hypotheses.

If we think now about the approach presented above, its development and implementation would take advantage of the “thematic syntheses”. Through ‘action research’, the project will try to answer some of the open questions previously mentioned. Such ‘action research’ should then be conducted in sites or landscapes in which a clearly defined ‘biodiversity issue’ occurs and where the project could bring targeted supplementary information and tools for facilitating needed negotiations.

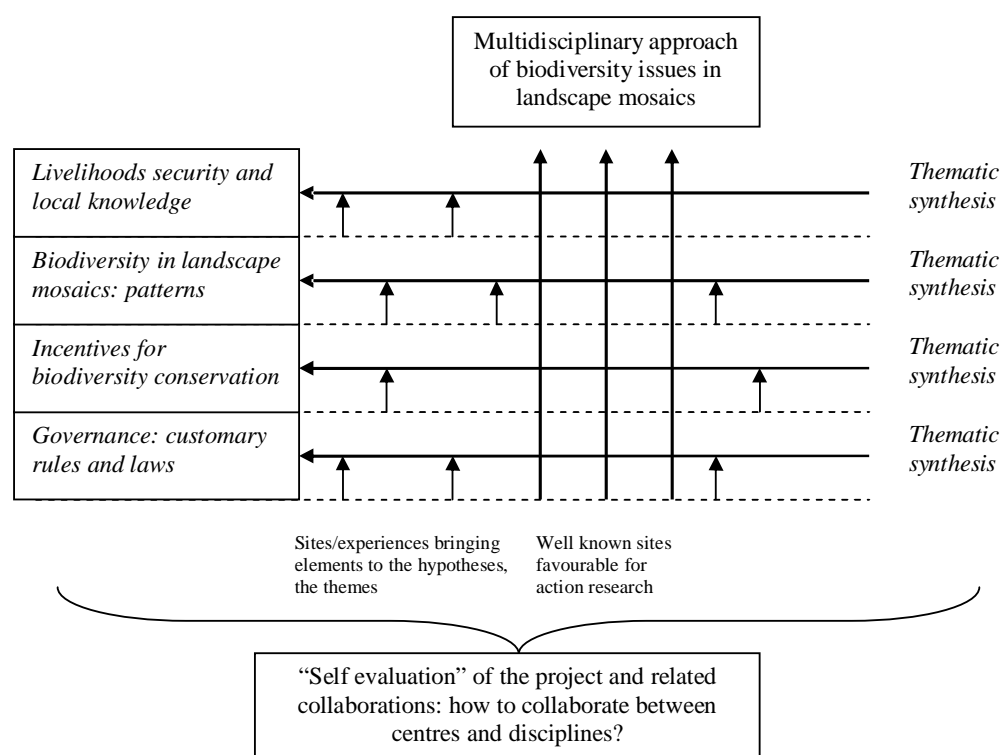


Figure 2. The framework of the project can be characterized by three working domains: thematic syntheses, action research approach and self evaluation (meta-analysis) on “the way to do research”.

The work of the project should lead to methodological outputs with regard to a more integrated way to do research, between international centres and partners as well as between different disciplines. In this regard, it was highlighted during the workshop that a “meta-analysis” level for monitoring the work of the Platform and the approach of the project itself (design, effectiveness, etc.) would be crucial in order to give some recommendation on a potential “new way of doing research together”.

Next Steps regarding the project

Before entering into the SDC project proposal's writing phase, the "coordination unit" of the Platform still has to gather comments and information. If the main intervention axes of the project seem defined (cross-sites synthesis and selected pilot landscapes for testing an action research approach), the next steps are:

- To work with key specialists on the way to refine the thematic hypotheses and define related operational research questions.
- To work with key specialists on the way to define a preliminary framework and steps for a "multidisciplinary, multi-scale" action-research approach (see the steps of the project's outline).
- To work with the resource people from both institutions to better know :
 - What information is available for sites and landscapes (especially where both institutions are or have been involved)?
 - What links exist between research results or current activities and the project's thematic hypotheses?
 - What could be the key conservation opportunities or constraints that may be interesting to tackle through our approach?
- To contact potential partners and discuss about their interests and possible synergies and to develop specific work plans at site level.

7. "Post-workshop": CIFOR's EPMR recommendations related to the Platform

The CIFOR-ICRAF Biodiversity Platform for rural landscape mosaics is a promising step towards enhanced collaboration and synergy between CIFOR's three research Programmes and ICRAF. As currently formulated, it is well-conceptualized and presents opportunities for fruitful collaboration, with a large number of local, regional and international partners and initiatives such as the Global Partnership for Forest Landscape Restoration. As with many other Projects, this initiative is very broad in scope. CIFOR and ICRAF will need to more clearly define their respective roles and more sharply focus their research activities in order to complement, rather than duplicate, on-going or completed research worldwide related to tropical landscape ecology and forest landscape restoration and management. This will require a more in-depth review of the literature to identify significant knowledge gaps, careful prioritization of study topics and site selection, and strategic partnership development. In its choice of partners, the joint initiative should look beyond the large conservation NGOs like CI, TNC and WWF. It should work more closely with communities, local universities, national forest research organizations, and other relevant organizations that may have complementary expertise (including local and traditional ecological knowledge), and those that are in a position to translate and transfer the project's findings into improved landscape management practices on the ground, and inform decision-makers at local and national level.

8. Glossary

This glossary was not discussed during the workshop and we intentionally did not want to enter into a “definition” exercise. However, as several important concepts and terms were used during the workshop and are reported in this document, we gather here some existing definitions to serve as general information to the readers.

Action research:

- A method for intentional learning from experience, originally formulated by social psychologist Kurt Lewin. "Action Research" is characterised by intervention in real world systems followed by close scrutiny of the effects. Its aim is to improve practice and it is typically conducted by a combined team of practitioners and researchers.
http://en.wikipedia.org/wiki/Action_research
- A (usually cyclic) process by which change and understanding can be pursued at the one time, with action and critical reflection taking place in turn. The reflection is used to review the previous action and plan the next one.
<http://education.qld.gov.au/curriculum/learning/literate-futures/glossary.html>
- Natural resource management is like jazz; it requires constant improvisation. This implies that researchers can no longer remain exclusively external actors, but need to engage themselves in action research to develop appropriate solutions together with resource users (Sayer and Campbell 2001).

Biodiversity:

- Comprises "genes, individuals, demes, metapopulations, populations, species, communities, ecosystems and the interactions between these entities" (Lindenmayer and Franklin 2002).
- The variability among living organisms from all sources, including inter alia terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity of species, between species and ecosystems (Convention on Biological Diversity 1992).

Cultural landscapes:

- "Combined works of nature and of man." They are illustrative of the evolution of human society and settlement over time, under the influence of the physical constraints and/or opportunities presented by their natural environment and of successive social, economic and cultural forces, both external and internal.
<http://whc.unesco.org/exhibits/cultland/categories.htm>
- A cultural landscape is a geographic area that includes cultural and natural resources associated with an historic event, activity, person, or group of people. Cultural landscapes can range from thousands of acres of rural land to homesteads with small front yards. They can be man-made expressions of visual and spatial relationships that include grand estates, farmlands, public gardens and parks, college campuses, cemeteries, scenic highways, and industrial sites. Cultural landscapes are works of art, texts and narratives of cultures, and expressions of regional identity. They also exist in relationship to their ecological contexts.
<http://whc.unesco.org/exhibits/cultland/categories.htm>

Landscape:

- 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 1995).
- “*Landschaft ist der Totalcharakter einer Erdgegend*” (“Landscape is the total character of a region of the Earth”) (Alexander von Humboldt cited in Zonneveld 1995).
- The landscape is “*die sichtbare Fernumgebung oder Fernsicht*”, (the visual surroundings), and “*alle sinnlich wahrnehmbaren Sondererscheinungen*”, (all sensory experiences) (Granö 1929 cited in Antrop 2006).
- Landscape embraces geo-ecological relations, spatial patterns, scenic and aesthetical qualities and even social and cultural traditions (Claval 2004 cited in Antrop 2006).
- 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).
- Large-scale conservation planning efforts at WWF and throughout the wider conservation community have identified priority areas - regions with particular biological importance - for conservation investment. Within WWF's ecoregion programs, such priority areas - often referred to as landscapes or seascapes - are identified in the ecoregion's biodiversity vision.
<http://www.worldwildlife.org/science/ecoregions/landscapes.cfm>

Landscape mosaics (also see landscape and mosaic):

- A geographic group of site-level ecosystems (Bailey, 1998).

Landscape unit:

- For the purpose of the forest practices code, landscape units are planning areas delineated on the basis of topographic or geographic features. Typically they cover a watershed or series of watersheds, and range in size from 5000 to 100 000 ha.
<http://www.for.gov.bc.ca/hfd/library/documents/glossary/L.htm>
- One of the fundamental truths in the study of natural systems is that there is no single correct scale on which to study dynamics. It is thus of fundamental importance to recognize how our perceptual scales condition the way we describe systems, how patterns change across scales, and how phenomena at different scales influence one another (Levin 1992).

Landscape resilience:

- The resilience of a system describes its ability to persist, to absorb change and disturbance and still be recognizably the same ecosystem.
<http://www.cazr.csiro.au/resilience.htm>
- The capacity of the system to absorb disturbances, reorganize and maintain adaptive capacity (Bengtsson et al. 2003).
- Resilience is the ability of a social-ecological system to undergo, absorb and respond to change and disturbance, while maintaining its functions and controls. Resilience provides the component for renewal and reorganization following the change. Vulnerability is the flip side of the resilience (Carpenter et al. 2001).

- Landscape resilience refers to the rate at which vegetation on the landscape recovers after the disturbance (O'Neill et al. 1997).

Landscape sustainability:

- Sustainability is multi-dimensional, involving the maintenance of natural resources and spatial patterns of land use that are ecologically, economically and socially beneficial. Its spatial dimension is strongly related to the interdependence of land uses and spatial processes, such as fragmentation (Bryden and Amanda 2005).
- “Little literature on sustainability exists at the landscape and regional scales. Yet these scales may be the most important for attaining sustainability. A sustainable environment is an area in which ecological integrity and basic human needs are concurrently maintained over generations.” (Forman 1995)
- Stability in the management of the system is an illusion that disappears when one chooses the scale of perception commensurate with the phenomena under investigation (van der Leeuw 2000).
- “The concept of Landscape sustainability should be applied to a wide diversity of landscapes: natural and cultural ones, traditional and contemporary ones, spectacular and ordinary ones. What has to be sustained in each of those is not yet solved. Also the definition of time and scale is needed.” (Antrop 2006)

Matrix:

- In technical language of landscape ecology this term refers to the most dominant and most extensive “patch type” (Forman 1995).
- In the conservation biology and forest planning literature it refers to areas not reserved primarily for nature conservation (Graig et al. 2000).
- Comprises landscape areas that are not designated primarily for conservation of natural ecosystems, ecological processes, and biodiversity regardless of their current condition (i.e. whether natural or developed) (Lindenmayer and Franklin 2002).

Mosaic:

- A pattern of patches, corridors, and matrices, each composed of small similar aggregated objects (Forman, 1995).

Multifunctional landscapes (MFLs):

- Co-existence of different spheres of landscape, such as ecology, economics, culture, history and aesthetics (Tress and Tress 2000).
- System of landscape qualities, functions and human values, that interact with the economical function (Soini 2001).
- MFLs should be conceived as tangible mixed natural and cultural interacting systems. They are concrete self-transcendent, self-organizing Gestalt systems of our total human ecosystem. They range from the smallest mappable ecotone to the global ecosphere landscape. For this purpose they have to be treated simultaneously as products of material, natural biogeophysical systems and mental cognitive, noospheric systems (Naveh 2001).

Tradeoffs:

- Usually refers to losing one quality or aspect of something in return for gaining another quality or aspect.
<http://en.wikipedia.org/wiki/Tradeoff>

Working landscape:

- A landscape used by people, for production purposes as well as for cultural, social and utilitarian values. This term is broader than that of "managed landscapes", as not all landscapes are "managed" and many are even mismanaged (Cunningham et al. 2002).

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Annex 1

Workshop on Launching the CIFOR and ICRAF
Biodiversity Platform
2nd – 5th March 2006
**CIFOR Headquarters, Bogor and Happy Valley (GG House),
Ciawi, Bogor, Indonesia**

Introduction to the workshop

1. Objectives of the workshop and “historical” background

Welcome everybody to the launching of the joint biodiversity platform. At this stage, each of us can for sure contribute in a significant manner to shape this “joint venture”. We hope that its future will also be as interactive as possible, with more and more voices from local people, in parts of the world where conservation matters and where a livelihood also remains a challenge.

In other words, we would like to give a start to a platform that will be useful for biodiversity conservation... in a complex and developing environment. However, we are all aware that many different people, in various circles, have a similar goal and that, unfortunately, *“ecological and economic systems both independently exhibit the[se] characteristics of complex systems. Taken together, linked ecological and economic systems are devilishly complex”*. (Constanza et al. 1993).

Therefore the challenge is probably to find our “niche”, to be able to adequately combine the skills of each one to develop synergies and... to **launch a living and “workable” platform!**

Objectives of the workshop:

- **Share our expertise and experiences to give the platform a large and solid ground.**
- **Get a common understanding of what the platform should be and where it should go (targeted outcomes and outputs).**
- **Design the first research project of the platform.**

- Some elements from the “Matrix matters report” (2002)

The “Matrix Matters” report has been prepared to assist ICRAF and CIFOR to achieve synergies in joint biodiversity research. The experts acknowledged that some work on biodiversity in landscape mosaics had already been done and proposed consequently a first set of goal, objectives and “projects”. Here they are, already slightly modified:

§ Goal

To promote biodiversity conservation and use through integration of biodiversity management, local livelihood improvement and governance at multiple scales by doing research that influences key conservation and development groups and by building capacity of individuals and institutions from developing countries.

§ Objectives

- a) Better use of existing scientific data and provision of new information for biodiversity management in landscape mosaics;
- b) Strategic support for pilot study sites promoting biodiversity conservation in working landscapes;
- c) Improve recognition of stakeholder interests, and definition of suitable incentive strategies, including those allowing rural people to sustainably manage biodiversity in working landscape mosaics;
- d) Influence global and national policies and corporate responsibility strongly supporting biodiversity conservation in development of working landscapes;
- e) Capacity building and development of training and resource materials for training in biodiversity management and conservation at multiple-scales.

§ Components

1. Ecological principles and practices for biodiversity management in tropical landscape matrices (comparative research and synthesis);
2. Strategic support for pilot studies at research and implementation sites promoting biodiversity conservation in working landscapes;
3. Strategies to engage and benefit local people involved in biodiversity management in working landscapes-- comparative research and synthesis;
4. Policy analysis and influence to promote biodiversity conservation in working landscapes;
5. Capacity building through information dissemination and training.

- Some elements from “CIFOR annual meeting” (October 2005)

CIFOR’s annual meeting was organized in a new way, an “OpenSpace” way. This permitted each participant to propose the subjects they wanted to be discussed among the interested people. Biodiversity research was proposed and discussed during two sessions of about two hours. Here are some highlights of these discussions in which ICRAF representatives participated.

From the general discussions

- Some regarded the **matrix matters report** as too broad, not well linked to the actual research of the centers and not able to identify/analyze the existing gaps accurately. The report also lacked some realism (very large need for funds and labour).
- The strategy for the Joint Biodiversity unit could be to start adding **value to the existing research**. It should include the work on cultural landscapes (landscapes with social and anthropological conservation values) and try to integrate researchers across the spectrum of subjects addressed by CIFOR and ICRAF. One of the targets for the Joint Biodiversity unit could be to link the research on how to maintain/design land uses that maintain biodiversity to “actual” research on biodiversity... **From a biodiversity unit to a biodiversity platform!**
- **Reflections on topics:** a) How management practices influence biodiversity (is improved coverage needed?), b) what are the methods for monitoring, assessing, valuing biodiversity (ongoing research on this, relatively well covered), c) *How landscape influence biodiversity through ecological processes occurring between its patches (Not yet covered!).*

- **Existing knowledge on:** sustainable forest management, biodiversity in plantations, biodiversity assessments, alternatives to slash and burn, trees and agroforests diversity... At a landscape level, especially “tree cover”, gradient from forests to agroforests. At a natural resource management level, incentives (PES) and governance.

Open questions

- The **term biodiversity** needs to be clarified – what do we mean when we talk about biodiversity research (concerns every researcher, almost every research?) - how to make the concept operational in terms of research? **Why biodiversity matters and to whom?**
- A biodiversity platform could be left too isolated if it concentrates on some specific project and is not able to integrate both centers. The research should be relevant at the institutional level as well as **engage already very busy people** in the Joint Biodiversity platform.
- **Organization of the platform?** How to work with the needed interdisciplinary coordination (livelihoods, ecology and policies)? Leadership?
- Development will happen – what possible scenarios are there for biodiversity? Joint biodiversity unit should not be focused only on Asia or mega diverse tropical rain forests, should not forget the **cultural landscapes**.
- How can our research increase people’s knowledge and understanding of biodiversity – how to disseminate the research for **local beneficiaries**?

Remarks from the annual meeting leading to this workshop:

- One should prioritize the long-term goals, outputs and expected results of the unit. Define the key problems and how, using what methods, we can reach those goals!
- One should organize a multidisciplinary workshop in 2006 for ‘biodiversity in dynamic landscapes’ and set the targets and agenda for the joint Biodiversity platform
- Results of the workshop could be published.

2. Biodiversity platform – current state and points to be discussed

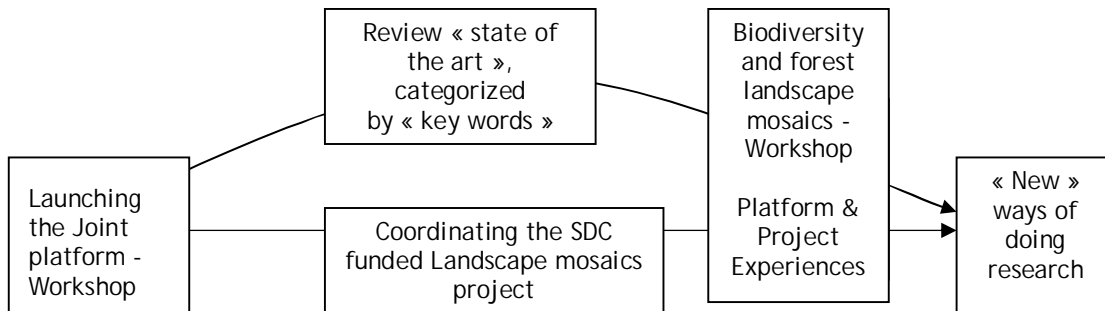
Some people have perceived the abovementioned matrix matters report as very ambitious. Nevertheless, it has had the great benefit of raising interest (among the centers and some donors) and to (re-)launch common discussions on the biodiversity concept and the possible gaps on which we could work.

Many scientists believe that a new way of doing research is needed with regard to biodiversity conservation, not only with regard to the probable weaknesses of the protected area/species approach and to increasing threats, but also with regard to new findings and technologies emerging from various domains, for instance social sciences and communication technologies.

None of us can be expert in all the issues that are required to really address conservation and development issues at the landscape scale. The platform could be a way to promote/share our own work with others. We hope that involvement with the platform will enrich our own research – for instance through a *forum for communication* within which to share ideas and borrow expertise.

The workshop should explore what *new ways of doing research* we want to develop in the way we manage knowledge and work together. For that matter, we have planned to create a specific website for the platform. How could it serve the platform the best?

During SDC mission in October 2005, right after CIFOR's annual meeting, the expected tasks of the scientists already involved in the platform (especially Piia and Jean-Laurent at that time, Jean-Marc soon) were discussed and the following main elements were seen as part of their potential activities.

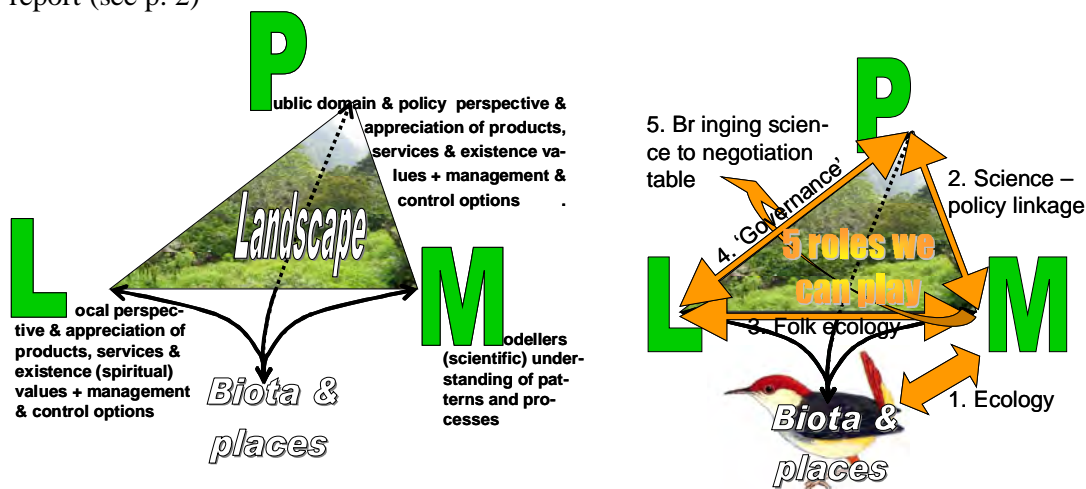


Reviews goal is to define the operational framework for biodiversity research. While an exhaustive review of all published work does not make sense, the key approach would be to add the value of existing research by categorizing it using key themes or key questions and link the findings at the landscape level. It focuses to synthesize what CIFOR, ICRAF as well as their partners have to say about biodiversity issues and how they have studied them.

Review could grasp the complexity of what we're dealing with by starting with 4 entities: the biota + sites that form the basis of our interest, and three domains of 'knowledge': local, public/policy and modelers/scientist. Acknowledging that we essentially have the 'scientist' role this leads to 5 perspectives:

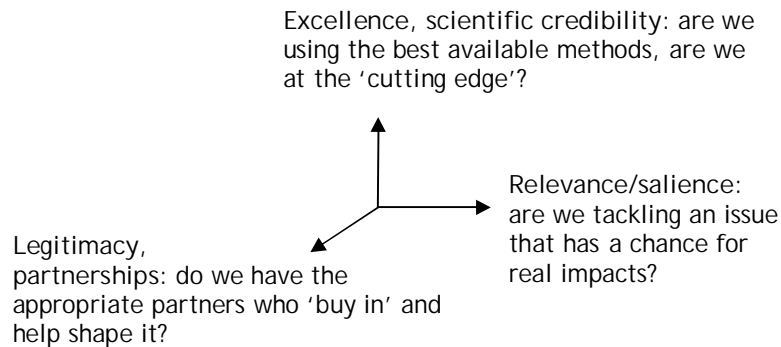
1. Ecology of mosaics (scientist + biota & places),
2. Science-policy linkage in relation to landscape biodiversity
3. Understanding folk ecology of mosaics 1 + local taxonomies, preferences
4. Understanding 'governance' issues in the landscape
5. 'Bringing science to the negotiation table'

These 5 perspectives roughly match with the 5 components of the Matrix Matters report (see p. 2)



Shaping together the platform

One way to design the activities of the project and platform is to think of three axes: salience, credibility and legitimacy.



We designed the first part of day 1 according to the relevance axis, especially to reach a common understanding about the outcomes, outputs and research questions of the biodiversity platform. We will have two main presentations, one from the conservation point of view and the other from local people's perspective.

We would like **to focus then on the second axis, on conceptual and methodological aspects** with presentations of different tools/approaches and with a discussion of **what is biodiversity and how to approach it in terms of research.** Without trying to re-invent the wheel, we would also like to place a particular emphasis on scale issues, if this is to be a landscape-oriented approach.

THE IDEAL OUTPUT OF DAY 1 WOULD BE ONE PAGE SUMMARIZING:

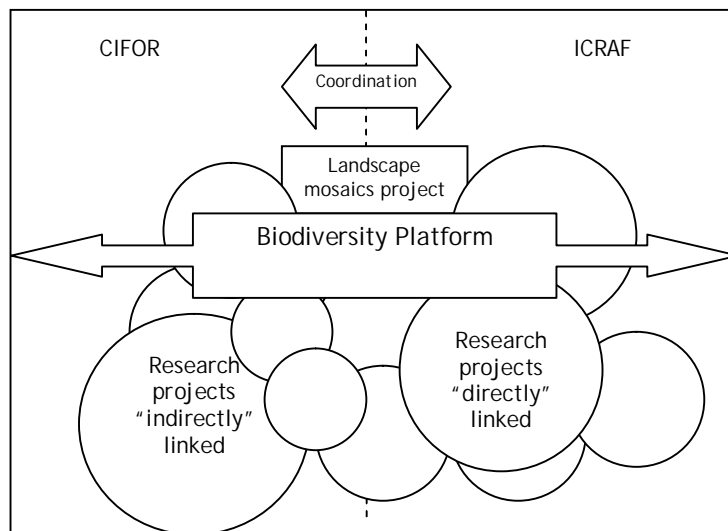
- **A common understanding of the terms “biodiversity” and “landscape”**
- **5 outcomes, related outputs and research questions for the platform**
- **5 related methods and tools that we could apply with regard to the research outputs**

The **third axis**, the legitimacy aspects – **for whom and with whom are we going to work** – will be approached more precisely during the following days, first in relation to your field experiences and the coming SDC project, and secondly with regard to the collaboration “on and with the platform”.

The term “partnerships” is open for a broad discussion about the way to collaborate between our centers, with local partners and solid field teams and at higher levels with different decision makers, other organizations and networks such as Poverty Environment Network - PEN, Alternatives to Slash and Burn - ASB, Forest Landscape Restoration – FLR. Moreover, with regard to the platform *and* the project, the matrix matters report already highlighted the importance of a multi-scale approach at a conceptual level and this is reflected in the project design (see next point).

For the time being, the platform can be represented according to various components – a coordination “unit” catalyzing exchanges, a first project (with multiple sites) which is to be seen as a first research among many other current or potential projects (that may be linked to the platform directly – e.g. with common work - or indirectly – e.g. through information exchanges). The platform has arrows pointed outward to

highlight the potential – and probably the need – to look for external partnerships (local communities, conservation organizations, research networks, governments).



3. SDC "landscape mosaics" project: current outline and elements for discussion

Perhaps like the "matrix matters report", the project's outline that you have already received seems ambitious at first sight, especially with regard to its "multi-site and multi-scale" framework. This design was discussed according to the recognition that we will have to deal with the "bigger picture", e.g. with various objectives at various level. It was based on the view that we have to understand and characterize landscape dynamics across different local contexts in order to derive a site-independent landscape typology.

In order to go towards a **"workable" project**, we would like to have your experiences and opinions as a starting point. The main question might be "what is useful and achievable in our position?"

It makes sense to look for synergies, i.e. to take into account what information we already have, what we can reasonably collect, how it can be analyzed in a way that we have some real answers to questions that matter (that we will have discussed during the first days). In addition to existing knowledge, researchers able to be involved in the sites are going to be a crucial element to consider. They can be center staff but local scientists will be encouraged to participate and there will be no restriction for partners. The idea of working with students may have many advantages in our context, as it was underlined during CIFOR's annual meeting. In terms of sites, we will probably have to be careful to avoid remaining where people may have been "*overloaded* by research", to maintain or develop a strong and unbiased link with local people.

§ Outline of the project (reminder)

Working title:

Landscape mosaics: tools for integrating management and biodiversity conservation in tropical landscapes

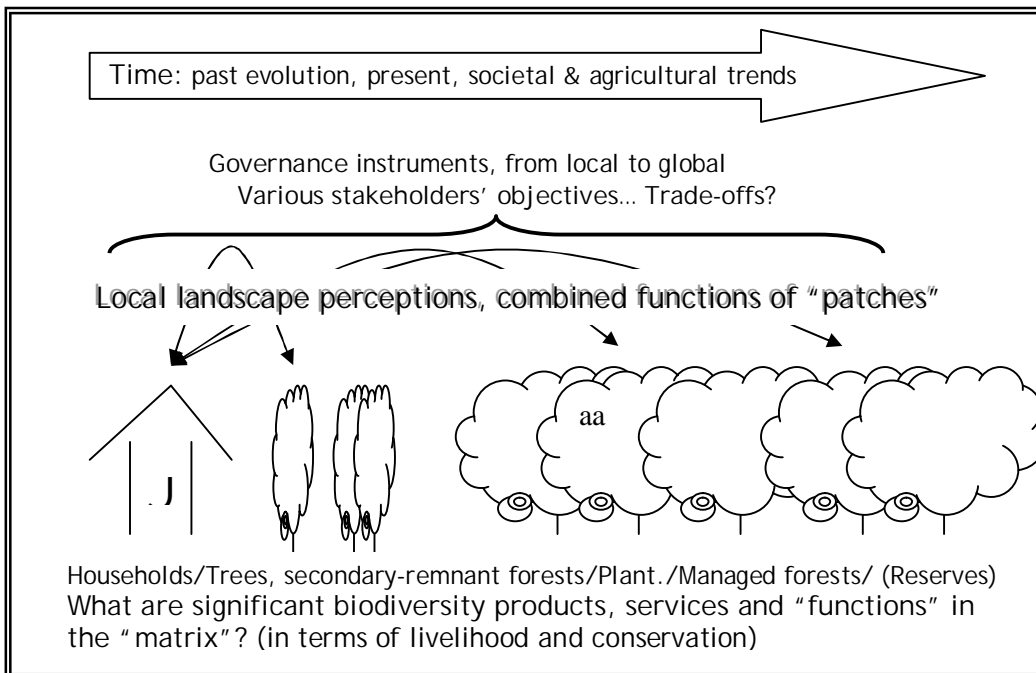
Purpose:

Match management and biodiversity conservation instruments for tropical landscape mosaics to the scale at which external conservation objectives can be combined with local resource use objectives through an appropriate set of incentives, regulations and rewards

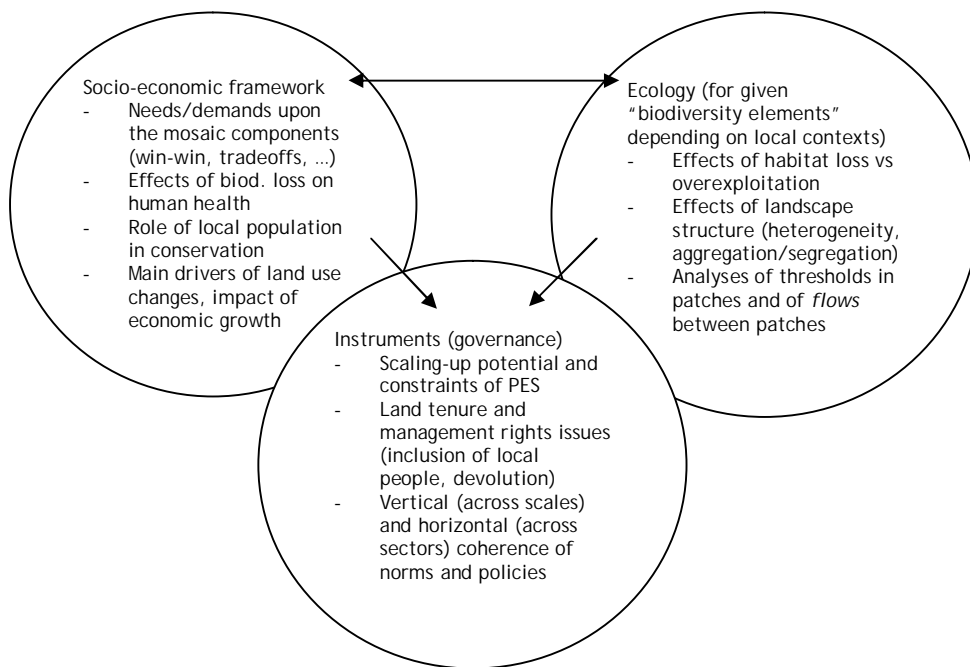
Steps:

1. Assemble a pantropical set of sites (10-20) with clear external biodiversity value and ongoing action research on the conservation/development interface (including active and past forest margins...)
- 2A. Characterize the landscape mosaic from a human use as well as biodiversity perspective in a standardized way, to allow cross-site comparisons
- 2B. Characterize biodiversity perspectives of local communities, local and national government bodies and external conservation stakeholders
- 2C. Summarize location-specific lessons about instruments that are being used and tested
- 3A. Synthesize data as regards the scale-related tradeoffs involved in local land use decisions
- 3B. Synthesize the data as regards 'habitat loss' or 'overexploitation' as main scale-related threats to biodiversity
4. Adapt and develop (multi-scale) tools and recommendations for combining conservation, management and development

§ Preliminary thoughts about the project



This scheme illustrates some interactions – between time, society, external and local people and... between elements of the matrix itself. As mentioned before, the framework of the platform as well as of the project is “by nature” interdisciplinary (anthropology-economy-governance, ecology, spatial analysis, etc.). Our job (or problem ;-)) is probably to focus on well defined research subjects in order to be able to realize comparisons between sites. Following are some elements that might be linked with research questions.



What follows is preliminary as we are going to discuss such points during the workshop and as site selection will essentially depend on research questions and what we will be willing to analyze and compare **between and within the landscapes and between the “patches”**. We only hope the following might help to launch the discussions.

The steps mentioned in the outline already define some crucial elements about which we have to develop a common understanding. They are the sites or landscapes, the biodiversity “subjects”, the threats and the “instruments”. In the end, site selection may be linked with a combination of these aspects. We present here some very first and rough thoughts according to them.

Sites

Forest margins are mentioned and the focus seems to be clearly put i) on ecosystems’ biodiversity of various patches (forests, agroforests and trees...) and/or ii) on species depending on those forests and trees in “frontier” fragmented landscapes or landscape mosaics. In principle, the idea of “matrix” focuses on areas which are outside parks or reserves.

Patches with “trees” and different kind of managed forests will interest our organizations. It may be appropriate to work in sites with numerous different types of patches in order to study the flows and interactions between these landscape elements.

The important point is that a landscape is not necessarily defined by its size; rather, it is defined by an interacting mosaic of patches relevant to the phenomenon under consideration (at any scale). The essential first step in any landscape-level research or management endeavor is to define the landscape, and this is of course prerequisite to quantifying landscape patterns.
(<http://www.umass.edu/landeco>)

A high number of sites (10-20) were mentioned in the project outline. To be as “economic” as possible, we may have to think about the opportunity to deal with “subsites” that would be located within a given region or landscape, may have some common features but diverge on one or another variable (e.g. effects of overexploitation rather than habitat loss, different local contexts, policies, etc.). For instance, the matrix matters report mentioned 8-10 representative landscapes and proposed to focus on Sub-Saharan Africa (poverty) and South Asia (population

density). To consider the global perspective and the activities of CIFOR+ICRAF in South America, we could imagine counting 2-3 sites per continent and would be happy to count dry ecosystems in addition to the humid megadiverse hotspots. With regard to people's traditional knowledge, some well "preserved" ecosystems will remain nevertheless interesting to have in the final set. A list of potential sites is provided in annex.

Two criteria are also mentioned: the need of an "external" biodiversity value and of on-going action research. The latter criterion is related to the idea of taking advantage of existing knowledge and researchers in place. It also means we will probably have to fill different knowledge gaps depending on the situations.

Biodiversity interests, biodiversity "subjects"

The criterion of the "external" biodiversity value was linked with the idea of rewarding conservation services for local populations. These external interests can be diverse (ecosystems/hotspots, charismatic/endangered species, wild relatives of crops) and come from different "circles". In addition to them and with regard to CIFOR+ICRAF goal of poverty reduction, one could consider that biodiversity conservation for "internal" purposes should be better acknowledged and if possible strengthened, especially in countries with high population densities and external pressures. In any case, we will need the presence of clear enough links between people and biodiversity issue in question. To define the biodiversity "subjects", one possibility is to be guided by the local/external interests and to use the related species/products/services "as an example" for the ecological analyses. At this stage, the approach and the process will probably be more important outputs than the possibility to generalize the findings.

Threats

The emphasis on threats often conceals other sources of resource degradation or misuse and the powerlessness of local communities in front larger political and/or economic interests in the hands of more powerful persons or groups, that keep a status quo or prevents alternate management paths. The "overarching threat" is probably formed by high population density and both overexploitation and habitat loss may be linked with a better understanding of human population dynamics and with gender issues.

However, we would like to consider especially the crucial issues of *overexploitation* (harvest and resource consumption) and *loss of habitat* (changes in land use and land cover) but will have to pay attention to potential effects of other threats' variables, in order to be able to derive cause-effect relationships. Possible other origins of threat to biodiversity may be the following (according to the Millenium Ecosystem Assessment):

- Species introduction or removal
- Technology adaptation and use
- External inputs (fertilizer, irrigation, pest control...)
- Climate and natural drivers

Search for trade-offs, use of governance and management “instruments”¹

As there are obviously different interests coming from different social groups and socio-economic levels which influence biodiversity losses or conservation, one needs to consider **multiple scales and stakeholders** to understand the processes related to threats’ origins and to conservation objectives. Gender aspects may be crucial when population growth represents the main issue and one can imagine that some trade-offs can be linked with societal and gender aspects. A better knowledge and information about the governance “power games” and about possible ways to strengthen mechanisms linking various actors with convergent interests for biodiversity conservation should surely be crucial outputs of the project. There is perhaps underevaluated “win-win” potential between local and external actors.

Trade-offs have been developed between the different stakeholders but those have seemingly not yet favored either poverty reduction or biodiversity conservation. Without blaming it, the traditional model of “protected” areas and species is to be seen as a first step, but unfortunately it will not easily fulfill the requirements of local people, sometimes even with ecotourism revenues. Better advocacy and access to management rights, land tenure issues and better inclusion in decision-making process may represent better leverages.

A new potential is emerging with the better recognition by external actors of the services offered by populations living in and around forested areas, for environmental services that can or could be sometimes bundled (biodiversity with water and carbon?) according to the interests in place. Payments for environmental services seem linked with very specific contexts and we still do not know well the potential to scale-up and the possibility of application in complex systems.

Towards a combination of biodiversity issues, stakeholders and instruments for site selection?

To go further than external interests only concerning site selection, we can distinguish local and external biodiversity interests and actors², especially with regard to potential interventions favoring local populations. Of course, it won’t help focus but can give another perspective at this stage of the reflections.

¹ **Among other things...**

- Protected areas, parks
- Land tenure - property/management rights
- Land-use and/or management plans, Collaborative Forest Management, Adaptive Collaborative Management
- Payment for environmental services (biodiversity, carbon, water, etc.)

² **Potential local influence (utilitarian and cultural perspectives)**

- Habitat losses for agricultural production or livestock husbandry
- Overexploitation of subsistence products (health, food... safety net role)
- Overexploitation of trade products (direct purchase or collection from outside)
- Conservation for regulation services (water, diseases, pests, pollination...)
- Conservation for support services (primary production, soil fertility)
- Conservation for cultural/spiritual services (culture, recreation... well being)

Potential external influence (utilitarian and non-utilitarian perspectives)

- Habitat losses for agricultural production or livestock husbandry
- Overexploitation of trade products (directly or indirectly)
- “Conservation services” (“ecologists” interests, value of resilience/option values)

For the site selection, we may not only think about diverse criteria (see hereafter), but also about sites with regard to a combination of “biodiversity subjects” and potential interventions:

Biodiversity “subjects”	Potentially interested people	Potential instruments	Potential sites according to consultation as examples
Conservation of endangered ecosystems and/or charismatic species (often animal) or wild relatives of crops	Conservation agencies Agro-business	Rewarding Conservation or Bundled Services, linked with enforcement	Batang Toru, Sumatra, Indonesia Danau Sentarum, Borneo, Indonesia Beforona, Eastern escarpment, Madagascar Morondava, Western coast, Madagascar Mt Elgon, Uganda Makokou, Gabon
Conservation of biodiversity products/services for local populations in cultural landscapes	Local population	Customary rules, CFM/ACM, land-use plans, policies, issues of land tenure...	Amapa, Brazil Acre, Brazil Pando, Bolivia Malinau, Borneo, Indonesia Bungo, Jambi province, Sumatra, Indonesia Sumberjaya, Lampung province, Sumatra Fouta Djallon Highlands, Guinea Several sites in Cameroon and West Africa
Conservation of a biodiversity “minimum” in intensively managed landscapes like large-scale plantations, animal husbandry, etc.	Conservation agencies Local population	Corporate responsibility, policies and enforcement	Riau, Sumatra, Indonesia

Other ideas on possible “must have” and “optional” site selection criteria
“Must have”

- Clearly defined biodiversity interests and “subjects”.
- Frontier/Fragmented landscapes (previously forests) - margins of “big forest”, occurrence of other (“many”?) land uses with forest and tree components around: remnant forests, agroforests, secondary vegetation, plantations.
- Known history and spatial coverage.
- Known farming systems, possible definition of “subsites” with different farming systems around an endangered forest ecosystem/within a country.
- Knowledge of current drivers of threats and of conservation.
- ICRAF/CIFOR knowledge, team or “solid” local/external partners (various domains: biophysical, socio-economic, spatial analysts)

Optional criteria

- Suitability for replication of subsites
- Existing knowledge of some “reactions” to threats (effects of habitat losses/overexploitation), some ecological thresholds,...
- Existing knowledge of instruments (rules, incentives/rewards) and of their impacts on habitat losses, overexploitation, land uses.

Annex 2- Potential sites

Name of the site/ landscape	Country	Mean annual rainfall mm	Elevati on m asl	Populati on density km-2	Contact person
Northwest of Pando, Bolivia	Bolivia				CIFOR: Pablo Pacheco, Peter Cronkleton, Cesar sabogal, Will de Jong
Acre, Brazil	Brazil				CIFOR: Christiane Ehringhaus, ICRAF: ASB staff
East Amazon, Brazil DJA-MINKEBE-ODZALA-MINKEBE Landscape, Central Africa (Cameroon, Congo, Gabon)	Brazil				CIFOR: Patricia shanley ICRAF: Peter Mbile, caft_Cameroun@yahoo.fr; cleto.ndikumagenge@iucn.org ; a.ntongho@wwfcarpo.org
Takamanda-Mone-Okwangwo Landscape, Cameroon and Nigeria	Cameroon Cameroon & Nigeria	3500 - 4500 2500 - 3500	400 - 700 100 - 2500	<25 15,707 people in TOU	CIFOR: Terry Sunderland
Makokou, Gabon	Gabon				CIFOR: Robert Nasi, Philippe Haeckerscheiler
Fouta Djallon Highlands, Guinea (Guinea Conakry)	Guinea Conakry			24-120	CIFOR: Oussenou Ndoye, Crispen Marunda, Daniel Tiveau, ICRAF: Brent Swallow
Bungo, Jambi province, South Sumatra, Indonesia	Indonesia	2500	50-300	60	ICRAF: Meine Van Noordwijk, Laxman Joshi CIFOR: (ACM) Carol Colfer, Moira Moelino, Yanti Kusumanto, Linda Yuliani
Sumberjaya, North Lampung province, Sumatra, Indonesia	Indonesia	2500	600- 1200	150	Universitas Brawijaya, BGBD: Prof. Kurniatun Hairiah, ICRAF: (RUPES) Dr. Suyanto,
Batang toru (Sibolga), Sumatra, Indonesia	Indonesia	2500	0-1500	50	ICRAF:James Roshetko, Meine van Noordwijk
Gunung Halimun, west Java, Indonesia	Indonesia	3500	300- 2500	100	ICRAF: Gerhard Manurung, Gamma Galudra
Bulungan Research Forest, Malinau, Kalimantan, indonesia	Indonesia	2500 - 4000	100- 2500	10	CIFOR: Petrus Gunarso, Douglas Sheil, Imam Basuki (MLA), Moira Moelino (ACM, Poverty and Decentralization)
Riau, Central Sumatra, Indonesia	Indonesia				CIFOR: Robert Nasi, Piia Koponen, WWF: Michael Stuewe
Danau Sentarum, West Kalimantan, Indonesia	Indonesia	3300 - 4000	0-35	8.5	ICRAF: Gerhard Manurung, Gamma Galudra
Mamberamo watershed, Papua, Indonesia	Indonesia		50 - 200	<1	CIFOR: Linda Yuliani, Moira Moelino

Mamberamo biodiversity corridor, Papua, Indonesia	Indonesia		50 - 200	<1	CIFOR: Manuel Boissiere
Waigeo Nature Reserve, Jayawijaya Wildlife Reserve, Papua, Indonesia	Indonesia		0 - 4000	Low	CIFOR: Manuel Boissiere, Krystof Obdzinski ICRAF: Wahida Patwa Shah, Mohamed Bakarr, CIFOR: Daniel Tiveau
Liberia	Liberia				
Eastern escarpment, Manompana/Beforona, Madagascar	Madagascar		0-1200	30	CIFOR: Jean-Laurent Pfund, Doris Capistrano
Morondava, Western coast, Madagascar	Madagascar	800	50	10	CIFOR: Habtemariam Kassa, Bruce Campbell, Jean-Laurent Pfund
Western African Sahel (Niger, Mali, Burkina faso, Senegal)	Niger, Mali, Burkina faso, Senegal				ICRAF: Antoine Kalinganire, CIFOR: Daniel Tiveau
Kitangland/Lantapan, Philippines	Philippines	2000	500-2000	60?	ICRAF: Grace Villamor, Dennis Garrity
South Africa	South Africa				ICRAF: Patrick Matakala
Mae Chaem, Thailand	Thailand	1500	300-3000	20	ICRAF: Veronica Areskoug
Mt Elgon, Uganda	Uganda				ICRAF: Jean-Marc Boffa, Willy Kakuru
Mekong area - Hue province, Central Vietnam	Vietnam (Mekong area - Cambodia Laos, Thailand)				CIFOR: Manuel Boissiere, Wil de Jong, William Sunderlin

Annex 3- Abstracts of Workshop Presentations

Conservation of Biodiversity in Landscape Mosaics: A Mainstream Perspective³

Mohamed I Bakarr, ICRAF

Introduction

Throughout the mid-to late 1900s, biodiversity conservation was focused on protection of so-called “charismatic” mega-fauna (i.e. large mammals that captured the imagination of early explorers). During this period, agriculture and extraction of natural resources for human livelihoods emerged as threats to biodiversity. Hence, mainstream conservation gained the reputation of being essentially anti-human, resulting in polarization of the two most important sectors that serve as the foundation for human survival in rural areas – agriculture and biodiversity. Although the pattern was more widespread in the open woodland ecosystems, conservation in forest regions was no exception.

Since the late 1980s, conservation paradigms have undergone very radical changes, shifting from a purely site protection focus (so-called “trench warfare”) to broad-scale, integrated conservation that attempts to accommodate human livelihood needs. Much of this transformation began with a wave of integrated conservation and development projects (ICDPs), many of which ended up in fiascos as a result of poor conceptualization. But the conservation community learnt a lot from failures of ICDPs. As a result, mainstream conservation now emphasizes: a) setting the right agenda for action through application of science and scientific principles, b) dialogue among scientists policy makers, funding agencies, rural farmers and civil society, and c) partnerships and alliances across disciplines and sectors. More importantly, conservation actions are now based on promoting the landscape approach, which involve defining and designing landscape units that integrate protected areas and other land uses.

Therefore, the message for global biodiversity conservation is now clear and consistent:

- Maintain representative networks of natural habitats – *protect habitats*
- Avoid extinction – *protect species*
- Consolidate natural areas into conservation landscapes – *integration protection goal with other land uses to leverage livelihood options*

This latter point establishes the context for cross-disciplinary and cross-sectoral alignments of conservation agendas in order to harness long-term benefits for biodiversity and human livelihoods. Landscape mosaics provide the perfect spatial framework for testing assumptions about the value-added of cross-disciplinary and cross-sectoral linkages, such as through the CIFOR-ICRAF biodiversity platform.

Science in Conservation

Progress in transforming mainstream biodiversity conservation has benefited immensely from the application of science and scientific principles in defining priorities and actions. This is demonstrated in four major areas:

³ The views presented here are solely mine and not those of The World Agroforestry Centre (ICRAF) or its donors.

1. Understanding large scale biodiversity patterns for improved targeting of conservation actions. Various conservation organizations have embraced the need for strengthening the scientific basis for defining conservation priorities and targets, such as through,
 - characterization of richness and endemism based on species ranges – *e.g. important bird areas* developed and used by BirdLife International
 - characterization of habitat variations based on vegetation patterns – *e.g. terrestrial ecoregions* used by World Wildlife Fund (WWF)
 - evaluation of the degree of habitat loss relative to original extent in ecoregions of high biodiversity richness and endemism – *e.g. biodiversity hotspots* used by Conservation International (CI)
2. Understanding landscape scale patterns and processes that impinge on biodiversity at multiple spatial scales, such as,
 - Locally - logging, hunting, over-fishing, conversion of forests to agriculture or pasture, fires, etc
 - Regionally - landscape fragmentation and ecosystem degradation loss of irreplaceable habitat
 - Globally - permanent loss of habitats within ecosystems and biomes
3. Effectiveness of protected areas as a “tool” for biodiversity conservation, mainly to serve the needs of site managers, for example, in relation to the following questions:
 - What is the nature of vegetation/habitat patterns in my park? *Implications for use by wildlife*
 - What is happening to my protected area? *Spatial and temporal dynamics*
 - What is happening to the landscape around my protected area? *Encroachment and boundary or edge dynamics*

Despite their vital role in protecting biodiversity, protected areas are ultimately “sitting-ducks” if they are managed independent of surrounding landscape matrix. For example, edge effects can be pronounced by “harshness” of the matrix, such as incidence of fires, changes in *biotic* and *abiotic* features, and exotic and invasive species. In addition, receding edges can lead to increased impoverishment of the habitat interior in forest ecosystems.

4. Evaluating land use options for designing sustainable landscapes - integration of biodiversity conservation and development needs. Information from 1-3 above can be used to evaluate land use patterns and anthropogenic changes in order to design conservation landscapes that better integrate multiple options. In addition, predictive modeling can be used to assess potential long-term impacts on biodiversity of biophysical change and trends in major economic drivers (*e.g.* deforestation, fires, climate change, and expansion of agricultural commodities). Such models can be used to establish *early warning systems* for biodiversity in fragile ecoregions.

Defining a niche for the CIFOR-ICRAF Biodiversity Platform

How can CIFOR and ICRAF evolve a strategic research agenda that leverages effectively for mainstream biodiversity conservation in landscape mosaics? The CIFOR-ICRAF Biodiversity Platform “aims to advance our understanding of, and capacity to manage biodiversity in human dominated landscapes.” Accordingly, the goal is “*to promote biodiversity conservation, restoration and use through integration of biodiversity management, local livelihood improvement and governance at multiple scales by doing research that influences key conservation and development groups and by building capacity*

of developing country individuals and institutions.” There is an immediate need for clarity on how the platform will approach alignment with mainstream conservation interest groups on concepts such as biodiversity conservation, biodiversity management, at multiple scales.

Because of our mandate and obligation to deliver innovations that benefit the poor and foster environmental sustainability, CIFOR and ICRAF have legitimate rationale for stronger engagement with mainstream conservation. But articulation of a goal that emphasizes “supporting” as opposed to “promoting” biodiversity conservation is key to defining the basis of our collaborative advantage with respect to salience X credibility X legitimacy. In this regard, *“research and capacity building to enhance conservation, management, restoration, and use of biodiversity, integrated with local livelihoods and governance at multiple scales”* will go a long way in building effective bridges with mainstream conservation interest groups.

Options for an integrated research for development agenda in landscape mosaics that will leverage immensely for mainstream biodiversity conservation include:

- Options for leveraging and sustaining benefits to rural livelihood – *incentives, rewards, empowerment, and rights (property and tenurial)*
- Options for managing and harnessing biodiversity friendly land uses – *mitigating loss of natural habitat, diversifying production systems, enhancing habitat connectivity*
- Science and innovations for biodiversity targets at landscape scale – *species persistence and ecosystem resilience; biodiversity “thresholds” in landscape mosaics*
- Tools and indicators for evaluating and monitoring biodiversity targets – *species and habitat dynamics in response to land use change*

All of these can be clearly justified in the CGIAR priorities 3, 4, and 5. But activities will need to be carefully benchmarked (with appropriate indicators) in order to demonstrate impact on conservation outcomes, in addition to CGIAR goals of poverty reduction, food security, and environmental sustainability.

Biodiversity and some thousands of other concepts...

Manuel Boissière, CIFOR

I have worked with the MLA (Multidisciplinary Landscape Assessment) team during the last 3 years as an ethnobotanist. The MLA set of methods has been developed in Kalimantan, but was tested and applied in many different sites and countries (Bolivia, Cameroon, Gabon, Mozambique, Papua, Sumatra, Vietnam, Philippines). The methods deal with the human aspects of the biodiversity management. It can be applied for conservation issues, land tenure and land management, community forestry. Even if it was first meant to be used with communities living in tropical forests and depending on forest products for their livelihoods, it has also been successfully used in countries where forests are becoming rare, and where rural communities are essentially depending on farming activities (e.g. Vietnam).

From my experience and background, biodiversity can be studied, understood in two different ways:

1. According to my work on MLA: how to add human and social aspects to more classical biodiversity studies? We focus on assessing the local perception of the forest resources and landscapes, taking into account the importance local people give to them, the social organisation of the villages, the history and stories linked to the landscape typology, the traditional ecological knowledge, and all elements that can provide different insights to better understand what is hiding behind the concept of biodiversity. Our work with the MLA (Papua, Philippines, Vietnam etc) was made within the context of biodiversity research, and for that reason it was developed within the Environmental Services and Sustainable Use of Forests Programme.
2. According to my background, from both human and natural sciences: how to ask local people to define biodiversity, as the concept is not clear even for scientists? Understanding the relationships of local communities with their environment, how they manage it, according to what traditional rules, was an important step, during my researches in Papua, to better understand the relations at the local level between all the elements characterising the biodiversity. But it doesn't give a definition of the concept. And it was always difficult to explain its meaning to the societies I was working with. In fact I think local people don't know and therefore don't care about biodiversity, because this concept is not used/defined in their traditional system of classification of the environment. Sometimes, the sole definition of forest is unclear, as people may not differentiate forests from other kind of landscape: they are leaving closely to it, sometimes in it, and they only recognize the forests products they can get from it, or some special places (sacred forests, fallow, high mountain vegetation).

This said, the different field studies we have done show that, recently, local people are learning about these concepts (**conservation, biodiversity, future generation, development, poverty alleviation, democracy**) from outsiders (developers, scientists, NGOs, government institutions), not because they understand the meaning or the implications these concepts bring, but because they know they have to use them to catch the attention and interest from people and institutions that may help them to improve their livelihoods, and make their voice, opinion, perception heard at a higher level. And we can therefore add another concept: **devolution...**

My interest is to understand the way local people appropriate these concepts, and how they define them in the local context. Are there any implications for their traditional rules, their

social organisation, and how do they perceive their own possible role in the decisions that can be made about their territory?

For example, **in Papua**, devolution has been accelerated after the special autonomy law in 2001. Using MLA tools, we have worked on local perspectives on the management of forests in Mamberamo watershed. We have observed that even if local people should have increasing rights in the frame of the new law, the situation of Papua remains sensitive, and the local point of view is still not strong enough to be heard at the government level when it comes to problems linked to biodiversity conservation and land management. Decisions on land use planning are still made at the province level without taking into account the priorities of the local communities. Some tentative can be observed of more devolution, with local people having more responsibilities in the local government, with local associations more active and recognized (FORMAS, LSM). But the administration of the province remains very centralised. In Mamberamo, once the Foja Mountain was recognised as a high value area for biodiversity, with many new species of birds, frogs, local people's role in maintaining this situation was almost ignored, and they were even suspected of helping potential poachers to reach the location (Nature 439, 16 Feb 2006). In the future, local people should be more considered as the best partners to protect what remains their own territory, whatever the richness of "biodiversity".

In **Vietnam**, MLA provided information on the role of local people in forestland management. There, very little devolution can be observed. All decisions concerning land management, forest protection, are taken at the National, Province, District or Commune levels. Local communities have no rights on their lands, and can even be forbidden to develop any extractivist activity in, or near protected areas. Community forestry (CFM) is still at its beginning in Vietnam, and regulations are still a top-down process.

In conclusion, even if our work emphasised the importance of devolution and of the local perspectives in all decision related to biodiversity management, still very little information is available on the local meaning of several concepts such as biodiversity, conservation, development, and still very little attention is given by decision makers (government, NGOs) to the local point of view and the role local people can play in forest management.

Biodiversity management in mosaic landscapes of the Sahel

Antoine Kalinganire, ICRAF

The West African Sahel a semi-arid landscape stretching from Niger to Senegal. The region is characterized by low and highly unpredictable rainfall patterns (400-1000 mm/year) during a 3-month period followed by a 9-month dry season and high temperatures throughout the year. There have been years of intense drought, and other risks to food security due to bush fires, crop pests, parasites, etc. People in the region have evolved strategies to adapt to this harsh environment and reduce their vulnerability to risks related to climate fluctuations and extreme environmental conditions. Part of the answer lies in the diversity of native trees and shrubs that people have used for generations in the parkland agroforestry system.

Parklands are mixtures of trees and shrubs that farmers select for certain functions and cultivate together with staple food crops, such as millet and sorghum (Boffa 1999). Parklands are managed to fit environmental conditions and to fulfil specific functions (foods, traditional medicines, fuel wood for domestic use; house construction materials; cordage; extracts for dyes; material for household implements, handicrafts and clothing; and fodder and medicines for livestock), so they vary in species composition and density within and among countries in the region. Many parklands, especially those situated immediately around the village, are characterized by a few “dominant” tree species, but this is not always the case. Parklands situated at greater distances from the village often have greater tree/shrub diversity, but again this is not always the case. When parklands are assessed throughout the entire village territory, they may contain 3-50 tree and shrub species per hectare (Niang *et al.* 2005; Larwanou & Saadou 2005).

Unfortunately, the parklands are being degraded due to several biophysical, socio-economic and political factors. Degradation due to the harsh climate, infertile soils, natural fires and pests is largely beyond the control of the rural poor, but the continually growing, rural population has arguably exacerbated this degradation. Decreases in both richness and abundance of these useful native trees and shrubs leaves the rural poor with fewer options to improve their health, nutrition and income. In addition, it reduces available habitat for other native plants and animals that figure importantly in local diets, medicines, etc. Moreover, since traditional knowledge is transmitted from generation to generation by using the plants, this knowledge is also being eroded as species' richness and abundance decrease. The loss of this knowledge will make it more difficult for future generations to establish and manage the useful native tree and shrub species in the region.

There are some projects assisting in the management of the Sahelian landscapes (see location sites on Figure 1) in the partnership with various donors (IDRC, IFAD & GEF) and the National Agricultural Research Systems. The followed methodology emphasizes participatory approaches involving all stakeholders (farmers, decisions makers, universities, schools and NGOs etc) and this is believed to have a direct impact on sustainable development and conservation of natural resources in the Sahel. In order to achieve this, rural communities are involved in all stages of the research/development process, working as partners with scientists, extension agents and educators.

This is an opportune time to take advantage of these attitudinal changes in the region, and strengthen the partnerships between national institutions and rural communities to rebuild the parklands. The results include the establishment of the Village Biodiversity Conservation Committees (members of such committees include village decision makers, CBOs, farmers, traders and processors of agroforestry products and other related activities), the development of manuals on the characterisation and evaluation of tree biodiversity in the Sahel, the assessment of regional policy on the management and utilisation of parkland agroforests (Kalinganire *et al.* 2005; Kalinganire *et al.* 2006; Abegg *et al.* 2006). Moreover all biodiversity stakeholders (developers, scientists, decisions makers and farmers representatives) at a provincial level for example, interact in an agroforestry RED consortium. These consortia are platforms of collaboration, information exchange that are used to plan and coordinate management of parklands agroforests within and outside the pilot areas. The consortia create the necessary synergies and complementarities in approaches and resources.

Past research and development activities on parklands was poorly coordinated, localized and fragmented – focusing predominantly on assessing biophysical effects and the contribution of parkland products on farmers food, nutrition and income. Management and enrichment methods have been investigated and developed but with limited farmer adoption rates and low survival rates of species used. These options included assisted natural regeneration techniques, tree management techniques, live fences, fodder banks, contour planting and introduction of high value trees in the parklands. The efforts are for increasing tree density and diversity of the parklands.

The low adoption of technologies aiming an improved management of parklands is mainly due to existing forest legislation. The evaluation of the legislations of the Sahelian countries made it possible to note that the various forest and land related texts do not sufficiently take into account the agroforestry systems within the framework of the positive law (Ly 2005). The present situation does not favour the management of the agroforestry parklands. Policy practices which would help for a better management of the Sahelian agroforestry parklands consist in not revising the current forest laws, but rather to look for opportunities by which agroforestry could benefit from a suitable legal framework. Such occasion is for example the on-going decentralization of natural resources management, inviting local communities and administrative units to play an active role in the management of their own environments. There are also customary practices and regulations favouring agroforestry practices, which should be acknowledged by respective governments.

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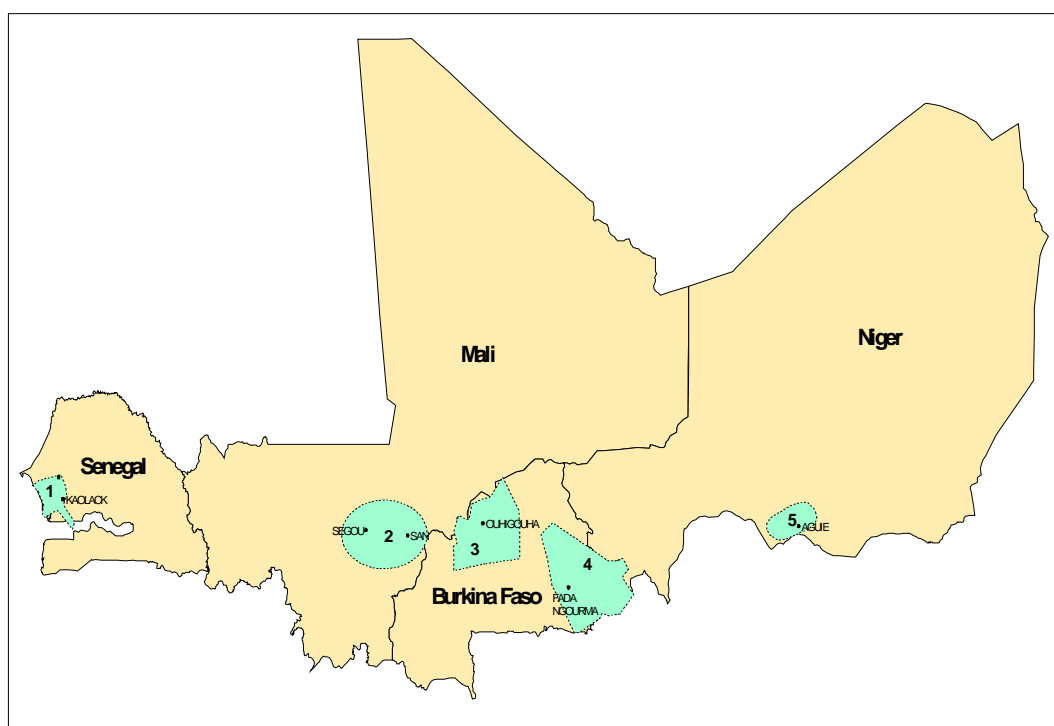


Figure 1. Location of major sites in the western African Sahel for landscape biodiversity research

Harmonizing people-park interactions for biodiversity conservation and development in the transboundary Mount Elgon ecosystem

Jean-Marc Boffa, ICRAF

Mt Elgon is an extinct volcano situated on the Kenya-Uganda border about 100 km northeast of Lake Victoria. It rises from 1,460m to 4,320 m a.s.l, it is the third highest mountain in Africa. It falls within the districts of Mbale, Sironko and Kapchorwa in Uganda and districts of Trans-Nzoia and Mt Elgon in Kenya. Conservation of the Mt Elgon ecosystem is justified by the benefits it provides locally and regionally as a catchment area and source of livelihood as well as for its unique biodiversity.

The park covers over 2,000 km² in Uganda and Kenya combined, and includes 180,000 ha of natural and planted forest cover in various conditions. It provides livelihood security for many hundreds of thousands of people – directly and indirectly. Mt Elgon is also the catchment for Lake Kyoga in Uganda and Lake Turkana in Kenya. A series of rivers (Bukwa, Siti, Kaplegeg, Sipi and Lwakaka in Uganda and Suam, Kimothon, Sosio, Laboot, Kabeywan and Rongai in Kenya) originate from this water tower for East Africa.

Mt Elgon presents distinct vegetation and associated biodiversity with altitudinal zonation. The mountain ecosystem includes four main forest types: 1) a mixed montane forest below 2500 m; 2) bamboo and low canopy montane *Hagenea-Rapanea* up to 3000 m; 3) a high montane heath to 3500 m; and 4) and high moorland beyond. The Park is not highly diverse, but supports many species of high conservation value because of their rarity and limited distribution. Compared to 65 other forests in Uganda, species richness in the Mount Elgon National Park ranks average for trees and shrubs, birds, small mammals and butterflies and is below average for large moths. However, in terms of the ‘conservation value’ of the species represented, Mount Elgon ranks in the top 10% of sites for trees and shrubs and large moths, and is above average for the other taxa. 123 restricted-range species, recorded from no more than five Ugandan forests, are known to occur. Thus, the flora and fauna of Mount Elgon is particularly notable for its rarity rather than its diversity.

Over the years, the Mt Elgon ecosystem has been threatened by agricultural encroachment and illegal resource exploitation resulting from a wide range of factors including political instability in the 1970’s and 80’s, lack of financial resources in the Forestry Department, insecurity of the population due to cattle raiding, population expansion in the area, declining land productivity and various other socio-economic factors. Most of the park is surrounded by land under agricultural production reflecting the high population density ranging from 200 to 600 people/km² or more in specific areas. Lack of roads to markets constrains the sale of local produce. Poor education and communication facilities and the lack of job opportunities maintain people strongly dependent on agricultural activity, in a context of increasing land shortage. Therefore, natural resources located within the protected area play an important role in daily needs including house construction, food security, health and cultural requirements. Resources with highest local value include bamboo, honey, medicine, as well as wood for poles, timber and fuel.

Mount Elgon has had a history of conflicts between ethnic groups, between residents and Karamojong cattle rustlers and between local people and park management

authorities. In the 1970s, the Forest Department started to resettle the Benet, an ethnic group of dispersed pastoralists living from hunting-gathering in the upper portion of the mountain, who had recently started cultivation in the protected area. The resettlement was done in a hasty fashion, and opposed by some communities and led a second boundary line in 1989. However, as the Forest Reserve became a National Park under management of the Uganda Wildlife Authority, the cleared area which was originally planned to be 6000 ha was resurveyed and found to be considerably larger. The Park boundary was redrawn according to the officially surveyed area of 6000 ha, resulting in intense social tension, and insecurity in land tenure and land use.

The Mount Elgon Conservation and Development Project was implemented in response to these threats. In successive phases between 1988 and 2000, the project worked with the Uganda Wildlife Authority on a range of strategies to conserve the Mount Elgon ecosystem and promote rural development in the communities dependent on park resources. These included the development of agricultural extension programmes, environmental education, establishment of a planted park boundary and support for law enforcement within the national park. In its latter phase, emphasis was put on linking the conservation and sustainable development components, through the development of collaborative management arrangements aiming at community participation in park management decisions and sustainable use.

Building on previous ICDPs in both countries, the 4-year Mount Elgon Regional Ecosystem Conservation Programme (MERECP) will be implemented regionally in 2005-2009 by IUCN with a series of partners. ICRAF is likely to be involved in activities related to promoting sustainable development in a landscape conservation approach including activities such as:

- Development and application of resource monitoring tools
- Participatory GIS-supported assessment and planning of community resource use and negotiation support for conflict resolution
- Buffer zone agroforestry to promote resource substitution
- Capacity strengthening and development support in agroforestry enterprises at farm and catchment levels

Collaboration is planned with the African Highlands Initiative (AHI) which is also present in Kapchorwa district and works to develop an institutional district-level platform open to all local stakeholders to plan, review and manage integrated conservation and development initiatives in a concerted way. It facilitates negotiation support mechanisms between the Uganda Wildlife Authority and key local ethnic groups including the Benet in the co-management of protected area resources. AHI plays a catalytic role among farmer groups to generate and implement plans for natural resource-based income generation activities that promote conservation through the facilitation of local NGOs including Action Aid.

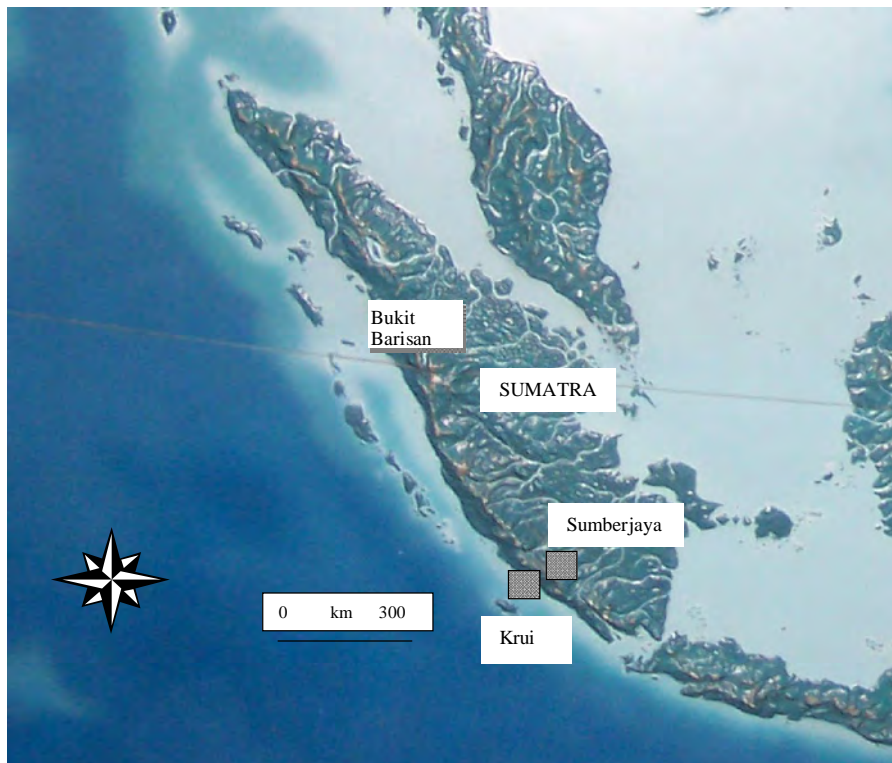
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Sumberjaya and Krui: Avian biodiversity in two contrasting locations in West Lampung, Sumatra, Indonesia.

Trudy O'Connor –ICRAF

Sumberjaya and Krui are two areas located in the west of Lampung province in Sumatra. This region was previously covered by lowland and sub-montane rainforest. This rainforest was also home to a rich assemblage of birds, including many endemic and range-restricted species. However, following the widespread de-forestation of Lampung, these birds have been subject to rather different fates in different areas.



Sumatra, showing topographic relief, and the areas of field study of Sumberjaya and the Pesisir, respectively east and west of the Bukit Barisan Range. Source: modified from Wis (2005)

Sumberjaya is a lower montane area in the foothills to the east of the Barisan range, close to the Bukit Barisan Selatan National Park. It appears to have largely escaped development until the 20th century, but in the second half of that century was subject to very rapid change. As part of a soldier re-settlement program in the 1950s, deforestation occurred for the establishment of permanent agriculture. Later programs of transmigration of people from the densely populated Java island, intensified deforestation, and for several decades this continued apace. The high prices available for coffee during the late 1970s also provided a strong financial incentive for forest conversion (Verbist and Putra 2002; O'Brien and Kinnaird 2003). It is now a largely agricultural region, with the main crop being coffee, while there are some forest remnants on the hill tops. There are various types of coffee garden, including monocultures, simple and more complex shaded systems. The landscape is also a

very patchy one, with these various gardens mixed with areas of scrub, grassland and rice paddy.

Krui is located in the Pesisir region, on the west coast of Lampung. This is west of the Bukit Barisan range, and borders the Bukit Barisan Selatan National Park. There, the damar (*Shorea javanica*) agroforests, which are the mature stage of a coffee-based agroforestry system, provide an interesting example of the long-term potential for development of coffee gardens. These agroforests are long-established and wide in area. Structurally, they compare well with forest due to the tolerance of many spontaneous germinants and planting of a variety of species beneficial to the community. They are rich in plant species compared with intensive agriculture, although species poor compared with forest (Michon and Foresta 1995).

Both Sumberjaya and Krui have been subject to conflict over land tenure. In Krui, damar agroforest lands which had been long stewarded by local communities were assigned by the government as a commercial logging concession. The situation was eventually resolved by the creation of a special conservation designation for the region. This was a precedent in Indonesia (Poffenberger undated). In Sumberjaya, the encroachment of coffee farms into designated protection forest led to violent conflict between the local community and government agencies, in the 1990s. Attempts to ameliorate these problems are ongoing. ICRAF is involved in the progressive negotiation of community forestry permits, which allow provisional tenure recognition to farmers who have established farms in protection forest areas, in return for their more careful stewardship of these lands (Verbist, Putra et al. 2005).

In terms of biodiversity conservation, the Krui system is often cited as a case study of 'success'. Not only are the gardens botanically rich, they also have bird assemblages that are relatively species rich, when compared with many agricultural systems, although approximately half of the relevant 'forest' species are missing (Thiollay 1994). In Sumberjaya, the situation seems rather different. Although the forest remnants (which are also disturbed) are a refuge for the bird species adapted to closed conditions, the largely agricultural landscape surrounding does not support many of these species.

The observable differences between the Krui and Sumberjaya cases are many. Some of those which might be relevant to conservation of avian biodiversity are:

Krui	Sumberjaya
Many native plant species used	Exotic tree and crop species
Broad scale of gardens – well connected	Landscape very patchy – many open areas
Tall and multi-layered system – comparable with forest	Gardens generally low in stature and simple in profile
Established system of cultivation for long term.	Population of incomers, many trying to make a quick profit after the mid 1990s coffee boom.
Long-established community aware of local species	Transmigrant community less aware of local species
Some recognition of land tenure	Land tenure still evolving.

Lampung has also become a target for bird trappers, who feed the markets for captive birds both locally and nationally. This seems to be a threat to birds in both Sumberjaya and Krui, although it is difficult to quantify.

It is too early to evaluate the impact of the new community forestry permits on Sumberjaya's biodiversity. The permits' focus on watershed properties, rather than biodiversity, as well as their slow uptake and still unclear conditions, suggest that expectations should be modest. Yet it seems possible that they have potential to create a more stable buffer around the remnant forests, possibly allowing a greater area of the landscape to be covered by a connective canopy. Ideally, this would also include some native plant species. The cooperation of the community, (through the farmer groups that are mandatory for the granting of permits) to maintain such a cover over the long term, could perhaps create a system more like that of Krui, where a reasonable compromise has been made between biodiversity conservation and community livelihoods.

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NIPAS: Strategy for Biodiversity Conservation and Participation of Indigenous People in the Philippines – After decades of Implementation

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The Philippines is one of the few countries designated as both megadiversity and biodiversity hotspot for its immensely rich and highly unique biological resources. The Philippine government as one of the signatories of Convention of Biological Diversity (CBD) strongly recognizes the critical importance of protecting and maintaining biodiversity for the present and future generation through the establishment of National Integrated Protected Areas Systems (NIPAS). NIPAS Act as enacted in 1992, is a prime national strategy for conservation of biodiversity. Among its main features are: (1) designation of an added layer of protection to stabilize protected area boundaries by establishing buffer zones; and (2) recognition of ancestral rights and the inclusion of the policy of community sustainability with the concern for the development of the socio-economic and political fibers of communities that directly uses the resources. Currently, there are 244 protected areas in the country as components of the law.

These features allow local and indigenous communities to continue their traditional land-use management and practices without jeopardizing the biodiversity in the protected areas (PAs). The said law enshrines the people's participation and indigenous traditional rights in the management of PAs while making sure that management zones such as strict protection zones, sustainable use zones, restoration zone, habitat management zones, multiple-use zones are clearly designated.

Mt. Kitanglad Range Natural Park provides a unique case study to clearly grasp the implication of the said law because of the ancestral domain claims of Talandig-Higanonon-Bukidnon tribe at the same time as protected area. The natural park, located in the central and northern portion of Bukidnon Province covering a total land area of 47,270 ha, provides habitat to the endangered Philippine Eagle (*Pithecophaga jefferyi*) and one of the last sanctuaries in the country. In 1992, the natural park became an initial component of NIPAS.

After decades of NIPAS implementation in the park the following were achieved:

- Establishment of Protected Area Management Board (PAMB), which acts a local governing authority;
- Federating the various peoples' organizations (POs) within the PA. POs become beneficiaries of financial assistance extended by local government units.
- Issuance of Community-Based Forest Management Agreement (CBFMA) which stipulates production sharing, rights, and responsibility to utilize, manage and conserve a specific portion of the forestland in PAs. As of 2001, 13 POs have been awarded with CBFMA by the management board and the DENR occupying 60% of the 16,270 ha buffer zone area; and
- On-farm demonstration modules of improved farming practice and environmental management were developed, and farmer training and train-the-trainer short courses on buffer zones were conducted.

In some buffer zone areas, soil conservation practices (e.g. natural vegetative strips, contour hedgerows) are being adopted for the farmers' crops while increasing the fruit and timber tree crops. Landcare approach is being implemented particularly in Lantapan and Claveria areas where significant progress has now been achieved in assembling the elements for an effective social contract to protect the biodiversity of the park while improving the livelihoods of the communities (Garrity, et al. 2002).

The essence of the NIPAS law is to put certain area under protected system to preserve the integrity of the natural ecosystems while recognizing the indigenous rights to their ancestral domain to strengthen their security of tenure in managing sustainably their natural resources within their domain. Based on further studies on NIPAS Act, the management zones specified in this Act are compatible and consistent with the cultural zones of the indigenous people.

However, despite of these developments, this Mt. Kitanglad Range Natural Park is continuously losing its natural habitats, which support threatened and endemic flora and fauna. Moreover, the PAMB is challenged by the sustainability, political and funding issues and problems.

Key areas need to be addressed to sustain biodiversity conservation of this important protected area; which include: 1) valuation due to the existence of buyers of environmental services from biodiversity protection; 2) carrying capacity and buffering strategies of the area where human and natural resources are interacting; and 3) impact of land-use changes to biodiversity therein particularly in the population of Philippine Eagles.

Annex 4 – List of Participants

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