

# Working Paper



Date: 9 September 2004

## Rapid Agrobiodiversity Assessment (RABA): A tool to capture the understanding and knowledge of stakeholders on the benefits of agrobiodiversity

Susilo Ady Kuncoro, Meine van Noordwijk and Fiona Chandler



### Introduction

Threats to biodiversity-rich, forest protected areas are mainly caused by humans (WWF, 2004). In contrast, outside protected areas humans also shape their environment - either in the form of managing forest in the buffer zone areas or managing productive land into land use types in which production and protection can co-exist. These types of land uses are also able to undergo similar functions to those performed by forests and protected areas (Plieninger and Wilbrand, 2001; De Clerk and Negregos-Castillo, 2000; Williams et al., 2001; Rasnovi and Vincent, in prep, O'Connor, in prep). Land uses displaying these characteristics are considered to be a haven for agrobiodiversity.

In regards to biodiversity conservation, one of the specific roles of agrobiodiversity is providing habitat and resources for partially forest-dependent species that would not be able to survive in a purely agricultural landscape. This can be done by constructing suitable 'matrices' of habitats and providing corridors or offering habitat niches for partially forest-dependent species.

#### Box 1. Definition of Agrobiodiversity

The Millennium Assessment defines agrobiodiversity as the variability among living organisms, including diversity within and among species and diversity within and among ecosystems. Agrobiodiversity is the source of many agroecosystem benefits and changes in agrobiodiversity influences the supply of ecosystems services.

The Convention on Biological Diversity definition of agrobiodiversity-spelled out in the three levels (Parris, 2001, p.28) is:

- genetic diversity ("within species"): the diversity of genes within domesticated plants and livestock species and wild relatives;
- species diversity ("between species"): the number and population of wild species (flora and fauna) affected by agriculture, including soil biota and the effects of non-native species on agriculture and biodiversity;
- ecosystem diversity ("of ecosystems"): the ecosystems formed by populations of species relevant to agriculture or species communities dependent on agricultural habitats.



Environmental degradation occurs due to lack of benefits flowing to the guardians of the land for their efforts in maintaining the ecosystems and harbouring agrobiodiversity. Where this has happened, potential areas of biodiversity conservation have been converted into intensively managed land uses. The underlying cause of the conversion is mainly financial as the immediate short term financial benefit of the new land uses is potentially higher than setting aside for biodiversity protection. These undergoing conversion processes are detrimental to longer-term sustainability and global biodiversity protection.

Different approaches; such as fencing and integrating conservation and development, have been tried to persuade or to enforce people to guard biodiversity but little success has been achieved. It highlights the need for a different approach to conserve biodiversity. One being considered is the use of market mechanisms and using payments for environmental services to reward users and managers of productive landscapes that can harbour biodiversity - known as agrobiodiversity.

Conservation through use is an approach in which agrobiodiversity fits and thus has the potential to alleviate poverty (Huq, 2000 and Solis-Rivera,

2000). Besides products from the agricultural crops and direct utilization of biodiversity, rewarding environmental services of biodiversity conservation through generating a market-based mechanism is seen as solution to strengthen livelihood opportunities. As a 'new' instrument that more fully recognizes local communities and their rights and abilities to make their own decisions, negotiated rewards and incentives are the focus of 'ES market' approaches.

Biodiversity and agrobiodiversity has many stakeholders and beneficiaries - but so far little effective ways have been found to link external benefits to the local decisions about land use that can affect diversity. Rapid Agro Biodiversity Assessment (RABA) is proposed as an analytical framework to identify the information necessary for providers and beneficiaries of biodiversity protection to engage in environmental service agreements. In the context of RABA, payment for environmental services falls into four main stages: (1) scoping out the domain, (2) identifying partners who will be engaged in the transactions, (3) negotiation among all stakeholders of equitable and efficient reward mechanisms and then (4) monitoring agreements to ensure compliance and sustainability. The RABA itself is designed to cover the first two stages and the framework as illuminated in the following figure:

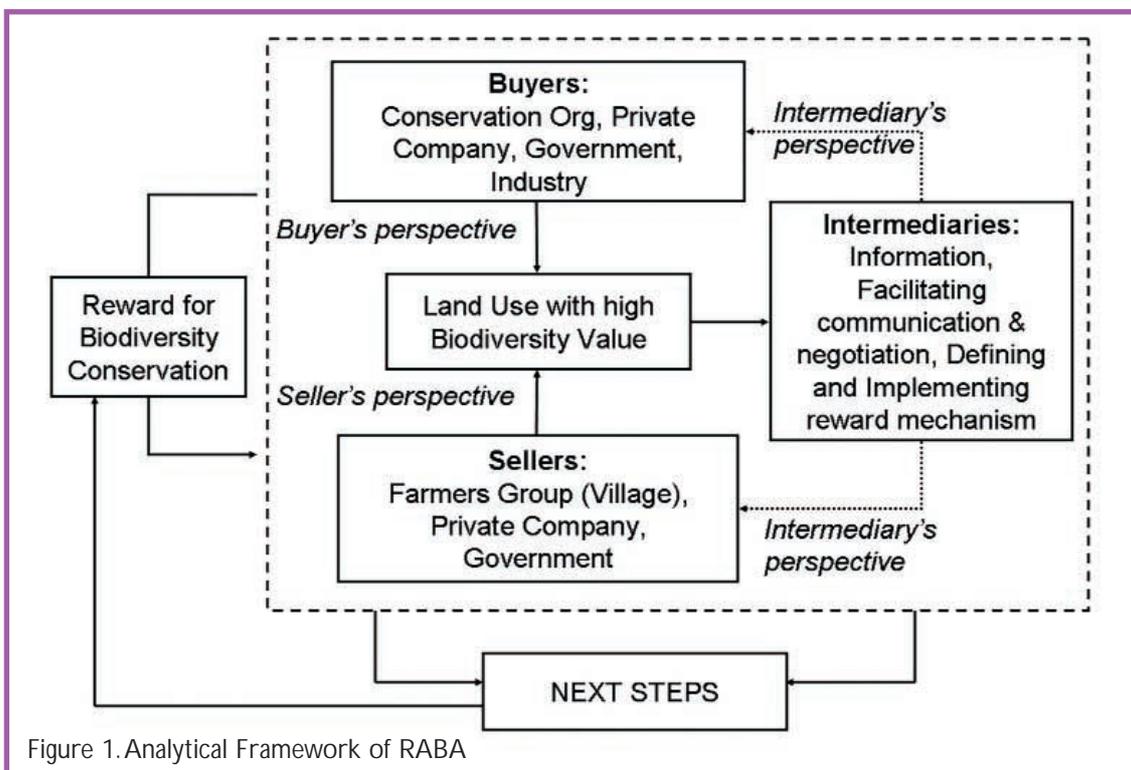


Figure 1. Analytical Framework of RABA



## Development of RABA

Biodiversity conservation today is not only an ecological realm but also a political construct. Although it is not as rigid as it was, the effect of political considerations in biodiversity

conservation can be seen from the traditional motivator of conservation actions being mainly based on the presence of 'flagship' species.

<sup>1</sup> Species that appeal to the public and have other features that make them suitable for communicating conservation concerns ([www.fishbase.org](http://www.fishbase.org))

Similar emphasis is also found in the existing biodiversity assessment methods. Little attention has been given to human-related aspects, although human-related activities have been suggested as being the major cause of environmental degradation.

This shows that there is a gap between the aspects that are being considered in 'common' rapid biodiversity assessment and the major causes. This gap, which is the substantial element in the development and management of agrobiodiversity, needs to be filled in understanding or measuring biodiversity in agricultural landscapes. In this type of land use, human involvement is intense and land tenure is a substantive matter.

Given the potential of agrobiodiversity to provide livelihood benefits to smallholder farmers and biodiversity benefits to the global community it is unsatisfactory that there is still few immediate rewards for the service being provided. This is in some part due to the current lack of clear criteria and indicators that are shared and understood by all the stakeholders on the benefits provided through agrobiodiversity. Therefore, RABA is developed as an iterative tool, which is hoped to serve as source of information as well as analytical framework and is built based on continuous compiling of information about the existing methods, development of technical aspects of assessment as well as lesson learned from case studies. The first version of RABA is developed based on desk study in combination with the

outcome of a RABA methodological workshop held in August 2004.

## Analytical Framework of RABA

As an analytical framework, RABA offers guidance on the important things that should be noticed in attempt to advocate conservation of agrobiodiversity in the context of payment for environmental services.

### Stakeholders Analysis

The initial step of RABA is gathering available information from different actors. The outcome of RABA methodological workshop suggested that the different actors (potential sellers, buyers and intermediaries all require some common information) such as;

1. Determining the stakeholders
2. Determining the most appropriate site
3. Determining aspects of agrobiodiversity to which actors are interested
4. Determining the extent of threats
5. Existing and future market niche for the products/services

In order to obtain the information mentioned, stakeholder analysis is suggested. The objective of conducting a stakeholder analysis is to understand who is involved or who has a vested interest in the management of rich agrobiodiversity at a certain spatial and temporal scale. Figure 2 outlines the stakeholder analyses.

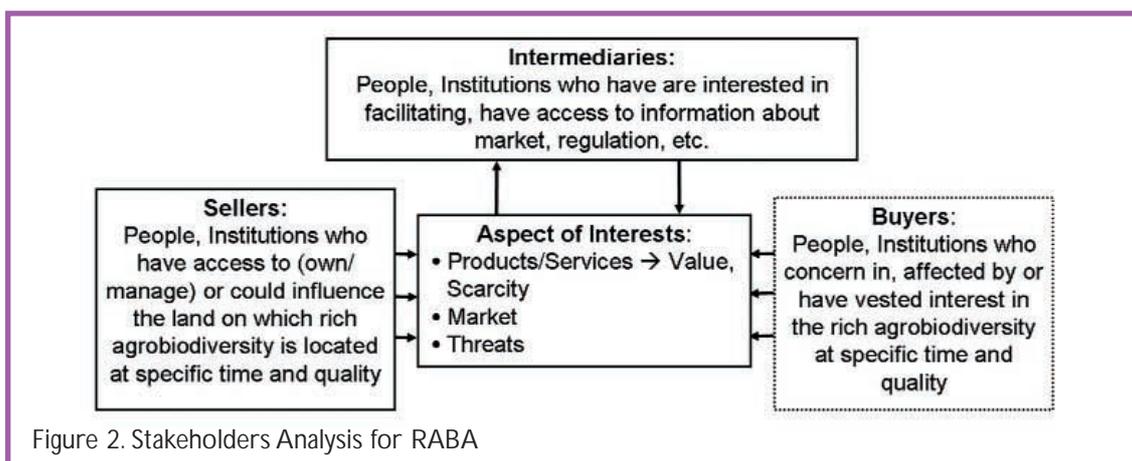


Figure 2. Stakeholders Analysis for RABA

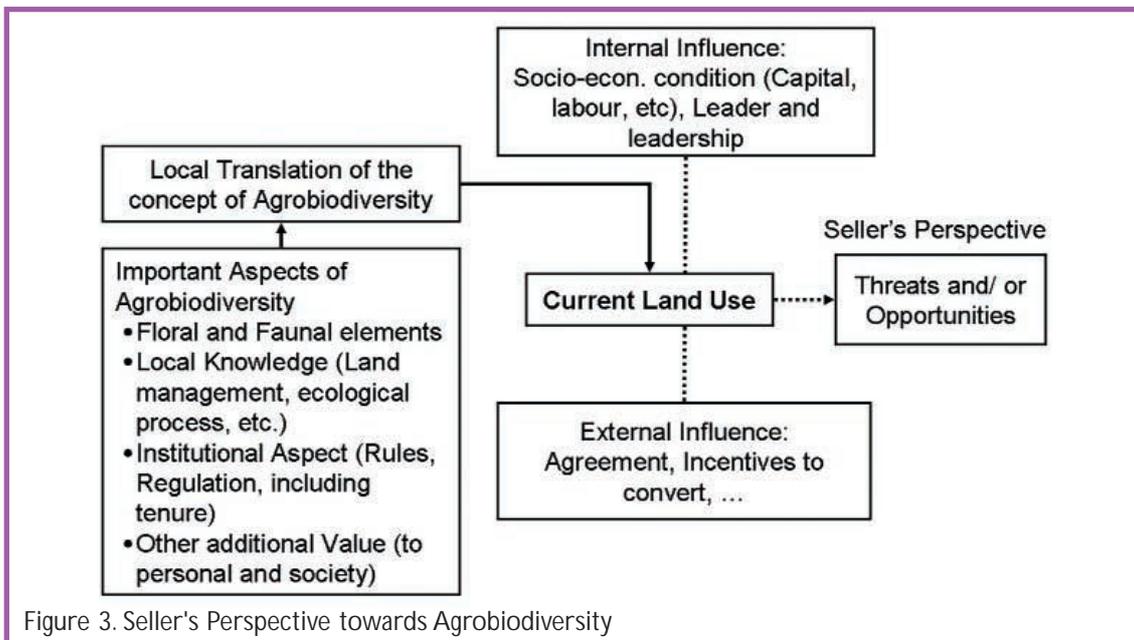
Whilst general information is obtained through stakeholder analysis, the more actor-specific information required is elaborated in the following sections.

### Sellers Perspective

Agrobiodiversity may be an unfamiliar terminology or concept for local people. The elements may be present in the land use systems which they are cultivating and practices they have been doing, but

local people might not know what the term refers to. Therefore, an initial step is to translate the term and concept of agrobiodiversity into local language and local context.

Additionally, the perspective is obtained through exploring the elements and aspects of agrobiodiversity as defined by local people. These may encompass utility and non-utility values of products and services from the targeted land use; including the religious importance of biodiversity,



institutions, local knowledge and other added values. Other parameters that are of importance include historical background of the location, traditional practices, institutional aspects including land tenure, land management practices and knowledge, social organizations and their experiences concerning direct and indirect biodiversity preservation activities.

The outputs of the above scheme are description or lists of what local people (sellers) perceive as threats and opportunities from current land use respective to the aspects they consider related to agrobiodiversity. Their preferences towards continuation of current land use practice in regard to external and internal influences are also considered in this process. The list of threats and opportunities are important as they will be used in formulating the next step for agrobiodiversity conservation or enhancement.

Other important points that should be noted are acquiring information about agreement or negotiation that has been made by local people with external actors and identification of a 'mental map' of local leaders. The former is of importance in regards to seek other opportunities to complement ongoing agreement with the proposed agreement for biodiversity conservation purpose. As for the latter, It is often found that a village<sup>2</sup> perspective is highly influenced by a few dominant people-usually by wealth. Therefore, for the magnitude of their influential power, the values these people think important as well as their expectation from a village should also be taken into account as an internal influence of changes.

<sup>2</sup> The result of RABA workshop in Jambi, Sumatra, suggested that there is a difference in terms of institution (values especially normative ones) between 'old' villages and new and transitional villages. It was mentioned that in the two latter cases, there has been a shift of respected values from normative towards practical (economical).

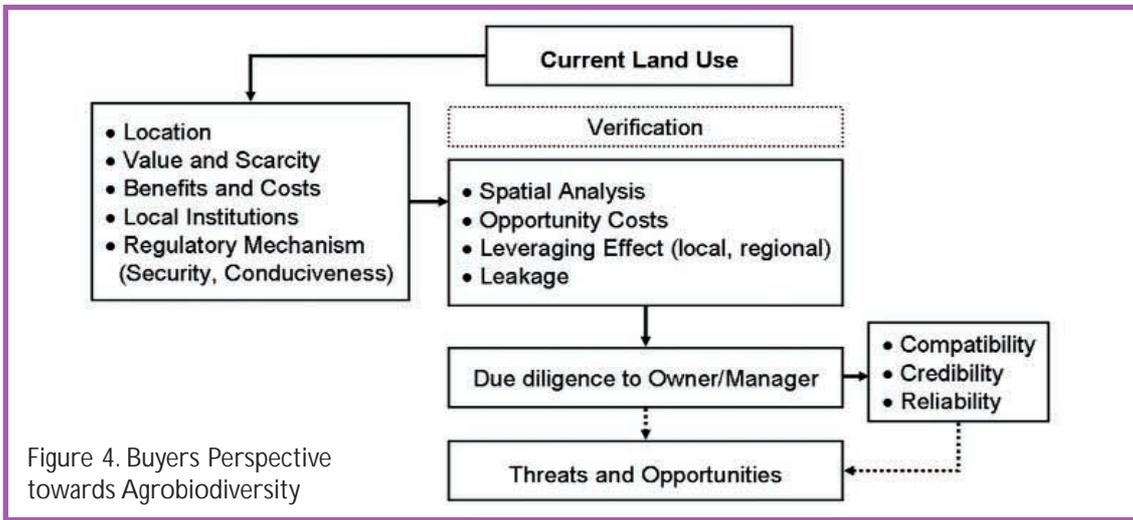
### Buyer's Perspective

Buyers of environmental services, biodiversity in particular, could comprise of government, conservation organisations and even private sectors. The perspective of buyers mainly covers three general aspects of biodiversity conservation; the product/services (extent or quality and quantity as well as compatibility of biodiversity), the impact of conserving agrobiodiversity to a larger scale and security of regulation, including land tenure.

One of the most important thing buyers consider in paying for biodiversity conservation is the potential of the location for the conservation efforts - both ecologically and economically - with the least occurrence of leakage. Spatial analysis of the potential location can broadly assess the potential of each possible location. The qualities being assessed range from the value and scarcity, benefit and cost, local institutions as well as regulatory mechanism, including tenure.

Other aspects that buyer consider essential is the credibility, reliability and compatibility of the seller to deliver the product are substantial. Therefore, it is necessary to conduct a due diligence assessment for potential sellers. The approach to capture buyer's perspective is elaborated in the figure 4.

Buyers need solid justification - usually scientific- to select potential locations for agrobiodiversity conservation. Existing methods that have been designed to assess various aspects of conservation have been the Rapid Assessment Program (RAP) developed by the Conservation International, Conservation by Design developed by the Nature Conservancy and others to assess ecological aspect; participatory approach to assess social aspects and other economic approaches to determine opportunity costs (ASB Matrix, etc.).



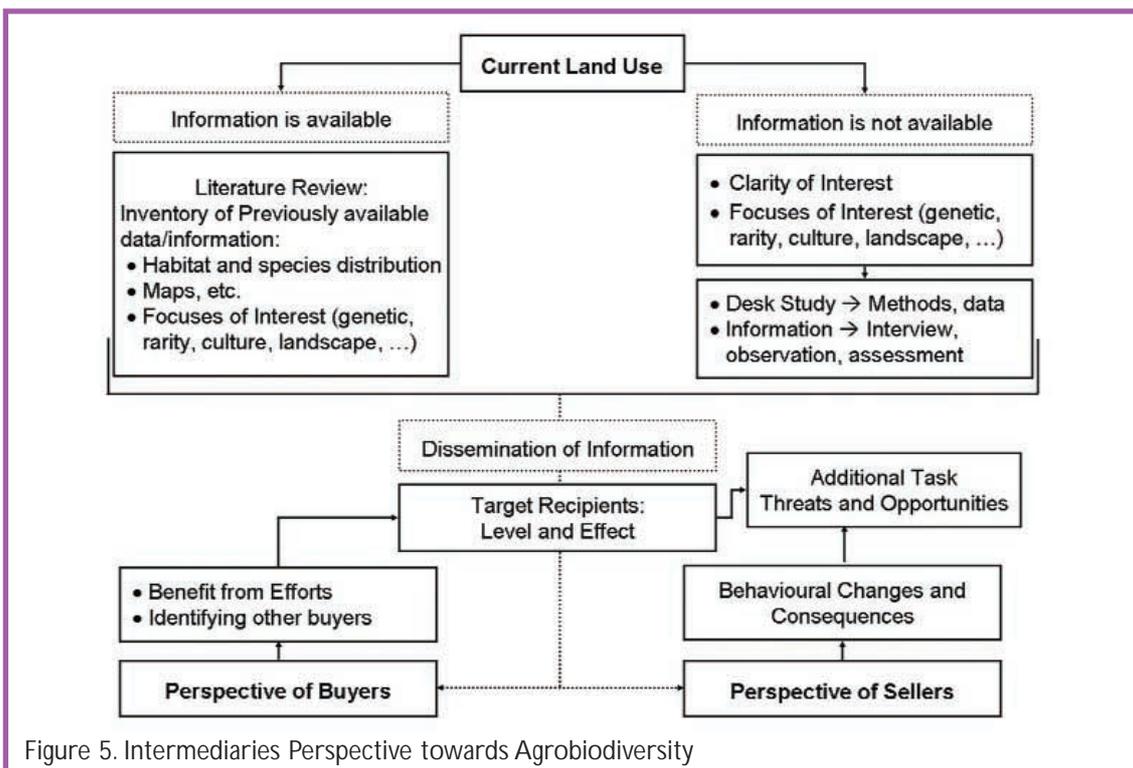
However, as the method (as well as most of the methods) is designed to assess conservation areas, it would need a tuning and adaptation before it becomes usable to assess agrobiodiversity.

### Intermediaries Perspective

Intermediaries are important in respect to their role in linking buyers and sellers as well as compiling and providing necessary information for both parties. The aspects that are considered necessary to be taken into account in order to facilitate the process of negotiation between sellers and buyers of environmental services can be seen in figure 5. It was highlighted during the RABA methodology workshop that the role of the intermediaries is in trying to find answers to these questions if the buyers and sellers cannot themselves.

Considering that information is the key element for intermediaries, their perspective differs by the availability of information available to them on the location for protection. A location whose attributes are already known is preferred as to some extent it would be easier to 'sell'. More effort – and more transaction costs – would be necessary to be undertaken prior to negotiation. However, as for the latter case – the one which the information is relatively unavailable, intermediaries highlighted the necessity of clarity of interest from the potential buyer to the location as a pre-condition for further step to be undertaken.

The key roles of intermediaries are finding and gathering information, communicating the information to sellers and buyers and bridging the gap between sellers and buyers by facilitating negotiation. The perspective of intermediaries is proposed using the scheme illuminated in figure 5.



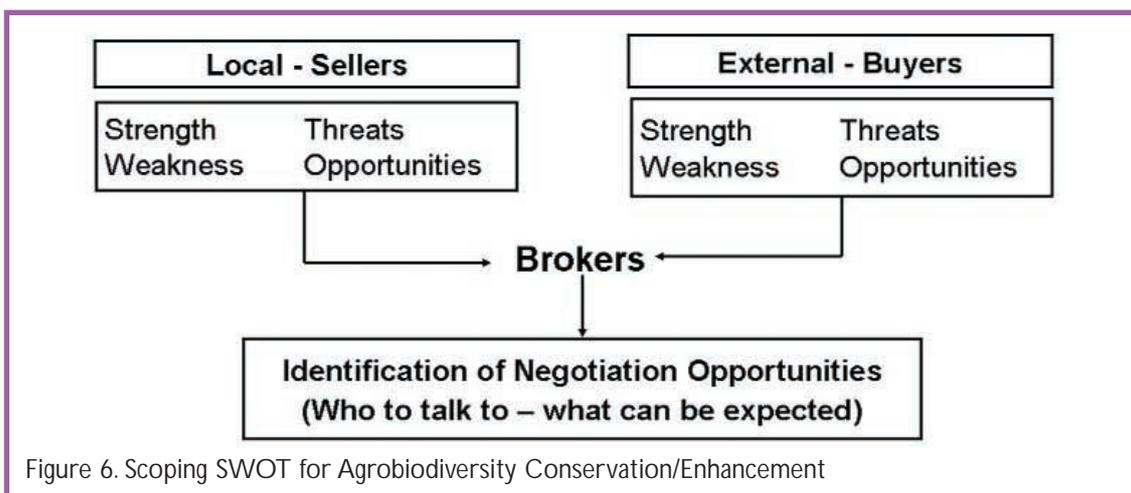
The most important thing from the perspective of intermediaries is to make people aware of the potential of their land uses for biodiversity conservation. As emphasised in the seller section, local people are mostly unaware that what they have or practice is actually beneficial to a larger fraction and so would be interesting to external parties. Therefore, the main objective after the completion of data collection is raising awareness amongst local people that what they have is actually valuable.

Representatives of local people in the case of Jambi (Sumatra, Indonesia) note that they have never been involved in any sort of negotiation or information dissemination from external actors

other than private companies who are interested in establishing commercial plantations. This limited interaction affects local people's perspective toward external interest, which to date has been solely commercial.

### Next Steps

It may be useful to categorise the scoping questions along the lines of a SWOT (Strengths - Weaknesses - Opportunities - Threats) analysis in an attempt to provide a logical sequence for the questioning and finding a way to group the questions from the sellers and buyers perspective. The role of the brokers (intermediaries) would be to link the results of the two SWOTs.



Using the SWOT as a basis for prioritization the following equation can be used as indicators:

Strengths - Weaknesses = functional value

Threats \* (Strengths-Weaknesses) = urgency of action required

(Threats \* (Strengths-Weaknesses)) \*

Opportunities = relevance of taking next steps: important threats that can be overcome.

If the sellers believe that the positive value of the system is higher than the threats but the buyers do not come to similar findings then there will be no demand for the environmental service. In this case the sellers would be keeping the system for their own benefit and not that of the external buyers. If, on the other hand the positive value were greater for the external stakeholders they would be willing to pay for the environmental service being generated.

In other words:

$(S - W)_{local} > (S - W)_{external} \rightarrow$  limited need for intervention beyond helping to realize local incentives

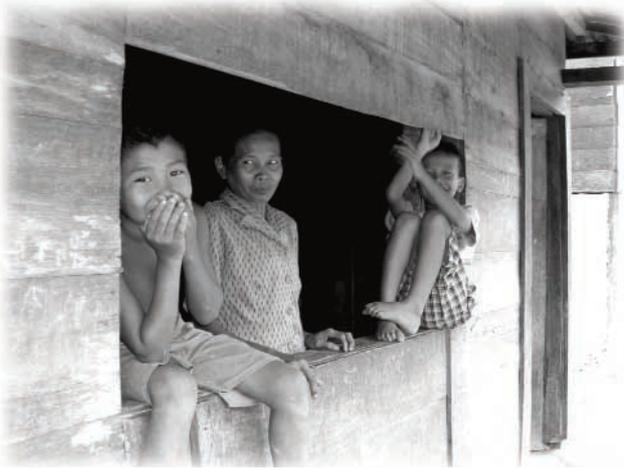
$(S - W)_{local} < (S - W)_{external} \rightarrow$  true externality requiring incentives to overcome opportunity costs



### Concluding Remarks

What is known about agrobiodiversity at this point is very little; hence the biggest challenge might be how to use the available information and resources to provide the best assessment of the conservation priorities between areas. Land uses of rich agrobiodiversity are potential as alternatives for conservation and have to be advocated by acknowledging and providing rewards to the owners and managers to reduce detrimental effects from biodiversity losses.

Bringing together the perspectives of three different stakeholders in biodiversity conservation can help to understand the importance of biodiversity from different point of views. Linking up the perspectives and providing necessary information to conclude a common understanding amongst these stakeholders is crucial to shift the negative effect of local causes of biodiversity conservation by capitalizing the opportunity from conservation.



Appendix 1. RABA Questions, List of Important Aspects from Different Perspectives

Sellers	Intermediaries: suggested questions to be asked		Buyers
	By the Sellers	By the Buyers	
<b>I. Scoping out the domain</b>			
<ul style="list-style-type: none"> <li>• What do we have</li> <li>• Positive sides of maintaining biodiversity?</li> <li>• Downsides of maintaining biodiversity?</li> <li>• Willingness to pay</li> </ul>	<ul style="list-style-type: none"> <li>• Urgency for conservation action</li> <li>• What can be gained from conservation</li> <li>• Available aspects of biodiversity</li> <li>• Who are the potential buyer/s</li> </ul>	<ul style="list-style-type: none"> <li>• Willingness to sell</li> <li>• What aspect of Agrobiodiversity under threats</li> <li>• Level of current threats</li> <li>• Other potential buyers – join forces</li> </ul>	<ul style="list-style-type: none"> <li>• How much should be paid and for what?</li> <li>• The extent of treats and pressure</li> <li>• Benefit from conservation and what is being bought?</li> <li>• The value and its scarcity</li> <li>• Where is the best location for conservation</li> <li>• The link of services provided to a broader scale</li> </ul>
<b>II. Identifying Potential Partners</b>			
<ul style="list-style-type: none"> <li>• Who should we talk to</li> <li>• Who are the important players?</li> </ul>	<ul style="list-style-type: none"> <li>• Who are the potential buyer/s (the whole pool) with whom seller can negotiate?</li> <li>• What is the necessary behavioural change?</li> </ul>	<ul style="list-style-type: none"> <li>• Equity and representativeness of local actors</li> <li>• Who are the stakeholders and major players</li> <li>• Due diligence</li> </ul>	<ul style="list-style-type: none"> <li>• Counterparts with whom an agreement should be negotiated</li> <li>• Management and control of resource</li> <li>• Credibility and reliability</li> </ul>
	<p>What are the implications of such change to daily life?</p>	<ul style="list-style-type: none"> <li>• Implication of decreased biodiversity to different levels</li> <li>• Appropriate actions at different levels</li> </ul>	<ul style="list-style-type: none"> <li>• Regulatory mechanism to provide guidance</li> <li>• Criteria to measure outcomes</li> <li>• Institution to use to reduce transaction costs</li> <li>• Level of sufficiency (amount of service at given landscape)</li> <li>• Conduciveness of regulatory framework</li> <li>• Security of regulation</li> <li>• How much is available</li> <li>• Ensure the payment reaches the seller</li> <li>• Opportunity costs</li> <li>• Existing market for the commodity</li> </ul>

## Reference:

- De Clecrk, F.A. J., and P. Negregos-Castillo. 2000. Plant Species in Traditional Mayan Homegarden Mexico as analogs to Multi Strata Agroforest. *Agroforestry System* 48; Pp. 23-34.
- Huq, M. F. 2000. *Biodiversity-Based Rural Strategy for Poverty Alleviation: In search for Insight and Element for from the Experience of Nayakhrishi Andolon (New Agricultural Movement) in Bangladesh*. Paper presented in Workshop on Biodiversity for Poverty Alleviation, Nairobi 12-14 May 2000.
- Parris. K. "OECD Agri-Biodiversity Indicators: Background Paper", in OECD Agriculture and Biodiversity: Developing Indicators for Policy Analysis, Paris, OECD Publication. Available at <http://www1.oecd.org/agr/biodiversity/index.htm>
- Plieninger, T., and C. Wildbrand. 2001. Land use, Biodiversity Development and Rural Development in dehesas of Quatro Lugares, Spain. *Agroforestry System* 51; Pp. 23-34.
- Solis-Rivera, V. 2000. *Poverty Alleviation and Environmental Services in Costa Rica*. Paper presented in Workshop on Biodiversity for Poverty Alleviation, , Nairobi 12-14 May 2000.
- WWF. 2004. *How Effective are Protected Areas? A Preliminary Analysis of Forest Protected Areas by WWF*. A Report prepared for the 7th Conference of Parties of the Convention on Biological Diversity, February 2004.
- William, S. E, M. van Noordwijk, E. Penot, J. R Healey, F. L Sinclair and G. Wibawa. 2001. On-Farm Evaluation of Establishment of clonal rubber in Agroforest in Jambi, Indonesia. *Agroforestry System* 53; Pp. 227-237.

## Web source:

<http://www.millenniumassessment.org/en/index.aspx>

The report of RABA Methodology Workshop can be obtained at the following link:  
<http://www.worldagroforestry.org/sea/networks/rupes/events.htm>



The Program for Developing Mechanisms for Rewarding the Upland Poor in Asia for Environmental Services They Provide (RUPES) is supported by the International Fund for Agricultural Development (IFAD).



Published by:  
RUPES Program  
World Agroforestry Centre (ICRAF)  
Southeast Asia Regional Office  
PO Box 161, Bogor 16001, Indonesia  
Tel: +62 251 625415, 625417; fax: +62 251 625416, email: [RUPES@cgjar.org](mailto:RUPES@cgjar.org)  
RUPES website:  
<http://www.worldagroforestrycentre.org/sea/Networks/RUPES>  
2004

Layout by: DN Rini & Hulaesuddin  
Photos: Susilo Ady Kuncoro  
orang utan <http://osha.ucsd.edu/orangutan.jpg>



World Agroforestry Centre  
TRANSFORMING LIVES AND LANDSCAPES