

SLE Publication Series - S246 -



**Towards sustainable land-use:
A socio-economic and environmental
appraisal of agroforestry systems
in the Philippine uplands**

Executive Summary

Study context

In the Philippines, more than a quarter of the country's population (i.e., approx. 25 million people), live in upland areas. Many depend on farming as their only source of income. Most of the uplands are forest land, so they belong to the Department of Environment and Natural Resources (DENR). DENR's primary aim is the conservation of natural resources. Many other national and local agencies are also involved in managing the uplands.

As a result, regulations related to land ownership and use rights are complex and often conflicting. Many farmers suffer from insecure land tenure, discouraging them to make long-term investments like planting trees on their fields. Uncertain land use rights also contribute to illegal logging and uncontrolled conversion of forest land to other forms of use.

In previous decades, most of the Philippine's forests have been lost. Such deforestation has provoked many negative consequences, including soil erosion, water scarcity, flash floods, landslides – and the loss of farmer's subsistence.

This study examines the extent to which agroforestry systems in the Philippine uplands are a sustainable land use. Sustainability in this context is defined as a practice that protects the environment, particularly forest lands, from degradation and, at the same time, provide a foundation for the upland farmers' livelihood, including sufficient income and social wellbeing.

In order to assess such diverse land-use systems in terms of their potential to generate environmental, economic and social benefits, the study team developed the Model for Assessing the Sustainability of Agroforestry Systems (MASAS). Through MASAS, the three dimensions of sustainability, that is, environmental, economic and societal, are operationalized by a set of indicators that are measured using quantitative data and qualitative information. A scoring mechanism allows these measurements to be combined, so an overall score representing the level of sustainability of an agroforestry system can be calculated.

The study was carried out in five municipalities in Southern Leyte Province on Leyte Island, Eastern Visayas, and in the municipality of Claveria, Misamis Oriental Province, Northern Mindanao.

Altogether, 100 agroforestry parcels were examined. To facilitate specific, yet comprehensive conclusions and recommendations, these agroforestry systems were grouped (i.e., stratified) into six strata named after their main crop, including banana, coconut, coffee, rubber, fruit tree, and timber tree based agroforestry systems.

Findings

The study revealed that by our metrics timber tree based agroforestry systems are the most sustainable, followed by rubber-based and coffee-based systems. In contrast, banana and coconut-based systems score lowest. However, despite its impressive score, timber-based agroforestry in the Philippine uplands is not completely free of problems. For example, farmers often struggle to get the legal permits and permission required to harvest their trees. In other cases, farmers do not want to plant trees since they have not managed to secure long-term land-use rights.

The assumption that coconut and banana-based agroforestry systems are not able to provide the same (or nearly the same) environmental services (e.g., soil protection) as trees-based systems was confirmed. Coffee and timber tree based agroforestry systems scored best on the environmental indicators, followed by rubber and fruit tree based systems.

Regarding socio-economic aspects, the fruit tree based agroforestry systems achieved the lowest scores, with coconut-based systems performing only slightly better. In other words, on average, these systems provide the fewest socio-economic benefits to the farmers in the study area. However, there are exceptions with good scores on the socio-economic indicators. The higher scores are explained by differences in the way these farms are managed. In most cases, low scores for the socio-economic indicators could be attributed to inadequate farm management practices (e.g., fertilizing, pruning, rejuvenating, pest control), to the use of low-quality seedlings and, in some cases, to the high age of respective perennial plants.

The rubber and timber-based systems achieved the best socio-economic results. A major contributing cause to these high scores was proper management of the transition period (i.e., the time it takes from planting to the first harvest of perennial crops). Availability of training and advice for the transition period and the systems overall were major factors contributing to the success of these systems.

In preparation for this study, one assumption was that, within agroforestry systems, there is always a trade-off between economic benefits and environmental services. However, this assumption was not confirmed since the combined scores for all socio-economic indicators correlated with some environmental indicators.

Another interesting finding was that agroforestry systems established on steep slopes, if properly managed, did not necessarily provide less environmental services or socio-economic benefits than those located on flatter terrain. This is a positive result for upland farmers who have no choice other than cultivating sloping lands.

An important finding of the study is that land tenure does influence the farmer's income. With only a few exceptions, the study results confirmed that farmers without secure and long-term land tenure earn less income. For example, all farmers

cultivating public land under an official temporary tenure instrument only had low revenues.

Recommendations

When promoting agroforestry, species selection and site matching are not the only important aspect influencing the sustainability of agroforestry systems. Providing training and advice to agroforestry farmers on required site and crop management practices is equally important.

Good management practices also include the production and use of quality seedlings, fertilizer and pesticides. Many farmers lack the necessary knowledge of how to properly use fertilizers and pesticides as well as the financial resources necessary to purchase them. Alternative and cost-efficient options (chicken dung, vermicomposting, integrated pest management) should be further explored and promoted to remedy this. Particularly in Southern Leyte, these techniques are not yet widely known. Here, training should be provided on how to produce and use organic fertilizers and/or nitrogen-fixing species.

High-quality fruit and rubber tree seedlings are fairly expensive and consequently unaffordable to smallholders. However, initial experience from some People's Organizations in Southern Leyte demonstrate that tree nurseries managed by farmers can produce high quality seedlings and generate additional income for farmers. In recognition of this, we recommended expansion of support for tree nurseries.

Providing more specific capacity building on how to bridge the transition period is highly recommended for all types of agroforestry systems. In addition, material support should be provided in order to make sure that the relatively high initial investment needs resulting from enhanced transition management can be met.

In this study, using the MASAS approach, banana and coconut-based agroforestry systems were identified as the least sustainable agroforestry systems examined in Southern Leyte and Claveria. However, there is great potential to improve these widely used systems. Better farm management practices along with increased integration of other perennials, especially fruit and timber trees, would result in these systems providing increased environmental services and generating enhanced socio-economic benefits.

In Claveria, most farmers who apply innovative techniques (e.g., use of organic fertilizers) do so due to the support they received from the Claveria Landcare Association. One main factor that has helped establish Landcare in Claveria was the cooperation with the scientists of the World Agroforestry Center (ICRAF) and the utilization of existing socio-cultural networks, including farmers' organizations,

women's groups and religious communities. It is highly recommended to support a similar process in Southern Leyte connecting, for example, Visayas State University in Baybay and Southern Leyte State University in Maasin with existing social networks of upland farmers.

The results of this study also show, that upland farmers with secure land-use rights achieve a higher income than farmers without such rights. At the same time, the former are more willing to plant trees. Therefore, it is recommended to work towards more secure tenure rights for all agroforestry farmers in the uplands. In doing so, one major objective should be to reduce the number of agencies involved in granting land ownership and land-use rights, thus increasing farmers' abilities to attain secure land tenure.

Despite good overall results in the assessment, a high number of farmers said that they were not willing to engage in timber farming again. Many had to sell their timber far below the officially estimated farm gate price and far below the price they had imagined. Another problem relates to the issuances by DENR of resource use permits (RUP) that are required to harvest trees. For farmers, such permits are difficult to obtain. For this reason, we recommend that timber tree based agroforestry systems should only be actively promoted by development projects and agents if tree harvest rights can be secured. At the same time, farmers should be supported in getting better access to information about market prices of different types of timber.

The study also revealed that many farmers hesitate to grow certain promising crops (e.g., coffee, cacao or rubber) because they see no available market. Therefore, it is also recommended to support the development of existing and new markets for these crops, especially in Southern Leyte. One way of doing this could be through brokering public private partnerships (PPP).

Finally, in conducting this study, the need for further agroforestry research became apparent, including the role of transition management in securing economic returns, the measurement of carbon stored in agroforestry systems, and the assessment of biodiversity in complex land-use systems.