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**UNDERSTANDING COMMUNITY
PREFERENCES FOR THE USE AND
MANAGEMENT OF
SAMAR ISLAND FOREST RESERVE
BASED ON PARTICIPATORY
RURAL APPRAISAL¹**



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RURAL APPRAISAL¹**

by

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In association with
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Eastern Samar Development Foundation, Inc. (ESADEF)
Samar Center for Rural Education and Development, Inc. (SACRED)

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EXECUTIVE SUMMARY

It has been acknowledged that the Samar Island Forest Reserve (SIFR) possesses a globally significant forest ecosystem and that protecting it for its environmental value and benefit is a priority concern. However, there remain conflicting priorities among different stakeholders especially those directly benefiting from the resources found therein. Apparently, those espousing the strict conservation of the SIFR are those remotely located from it, and would benefit only if other direct users give up their present claims and/or utilization patterns and practices. On the other hand, communities living within and nearby forest areas are living at subsistence levels, and their resource uses and practices are often conceived to be inconsistent with resource conservation and sustainable management principles. It is within this context that participatory rural appraisal (PRA) plays a key role in eliciting the perspective of forest and forest-edge communities on the use and management of the SIFR.

PRA is a research tool designed to analyze existing conditions in a rural setting by obtaining information through community participation. It consists of a set of participatory and primarily visual techniques for assessing community resources, identifying community development and conservation problems, and appraising strategic options for solving them. The use of graphic representations such as diagrams, figures, maps, tables, etc. created by the community to convey its needs, ideas and priorities legitimizes local knowledge, hence promotes people's empowerment.

In the context of SAMBIO's stakeholders' analysis, the primary aim of the PRA was to identify the communities' priorities for the use of SIFR based on their actual needs and aspirations. This was achieved by purposely selecting a mix of PRA methods and tools: pre-appraisal dialogues, community assemblies or meetings, natural resource inventory, resource and social mapping, transects, seasonal calendar, time trends, livelihood analysis, preference ranking, community validation, and data analysis.

PRA was undertaken in eight selected municipalities covered by the SIFR that extends over three provinces of Samar Island, involving 18 forest and forest-edge communities from February to April 2000. A total of 400 local community members participated in the PRA sessions. The PRA activities were facilitated by community development workers from SAMBIO's local NGO partners: Tandaya, ESADEF, and SACRED.

Among the rich data gathered from the PRA activities, results generally indicated communities' extensive knowledge of the forest and its resources. More importantly, the findings reveal the highly dependent relationship these communities have with the forest. The transect and resource mapping and inventory shopped seven ecological zones classified by the communities with respect to the main uses of its resources: old growth forest, secondary forest, swidden farms, human settlements, river systems, brushland/grassland, and permanent farmland. Within these ecological zones occur the following major socio-economic activities and values attached to it: farming, timber cutting, non-timber forest products gathering, firewood gathering/charcoal mining, hunting, freshwater fishing, extraction of medicinals, mining, settlement establishment, sourcing of water, transportation, and natural heritage. From these areas and activities, communities

have greatly benefited from the SIFR. Among the values attached by the communities on the SIFR are those of direct use values - which are either subsistent (food, habitat/settlement, firewood, construction materials, and medicinals) or commercial (timber, and rattan); indirect use values (prevention of soil run-off, water quality maintenance, and transportation) and non-use values (existence and bequest values).

A culminating activity of the PRA process was a workshop among the participants on their options and preferences for the SIFR use and management. The analysis of options and preferences also follow a review of income sources and livelihood patterns of the communities. The results reveal that based on the relationship and value attached by communities to their resources, some of the options and preferences for the SIFR's use and management articulated were: kaingin farming, permanent farming, barangay development, and forest conservation. The preferences reveal that there exists a conflict between conservation efforts and livelihood and that the incompatibility of the two greatly affects sustainable management of the SIFR.

Therefore, if proper and sustainable management of the SIFR is desired, the following points will need to be addressed:

- Swidden and permanent farmlands are expanding and agriculture is intensifying at the expense of secondary forests and brushlands and is moving towards the old-growth forests.
- The rate of resource extraction is increasing and in many cases employing highly destructive extraction practices.
- The values attributed by the communities on their forest resource needs to be inputted in the general SIFR management equation.
- Management options for the SIFR should provide benefits equal or greater than those being presently enjoyed by communities.
- Communities need to be directly involved in the over-all process of resource management development.
- Rural areas, as a whole, need to be developed alongside the conduct of SIFR management.
- The subsistence activities of communities have a low negative impact compared to highly commercialized activities.

UNDERSTANDING COMMUNITY PREFERENCES FOR THE USE AND MANAGEMENT OF SAMAR ISLAND FOREST RESERVE BASED ON PARTICIPATORY RURAL APPRAISAL

1. INTRODUCTION

1.1 *PRA in the Context of SAMBIO*

Samar Island Biodiversity Study (SAMBIO) was conceived to complement efforts already being made by various parties - UNDP/GEF, DENR, NGOs, LGUs and many others - in protecting what remains of Samar Island Forest Reserve's (SIFR's) biodiversity, as well as other environmental values and benefits offered by this globally significant forest ecosystem.

However, while it may seem that a consensus has been reached as to the final management option for SIFR, there remain conflicting priorities among different stakeholders especially those directly benefiting from the resources found therein. Apparently, those espousing the strict conservation approach are those remotely located from it, and would benefit only if other direct users give up their present claims and/or utilization patterns and practices.

The major contribution of SAMBIO is, therefore, to find a solution among the seemingly conflicting interests and priorities of key stakeholders dependent on the resources of SIFR. Through methods and processes that engage the stakeholders in determining the possible land use and management options, SAMBIO seeks to arrive at a win-win situation to pursue the objective of sustainable management for SIFR.

It is within this context that participatory rural appraisal (PRA) plays a key role in eliciting the perspective of forest and forest-edge communities on the use and management of SIFR. Living at subsistence levels, their resource uses and practices are often conceived to be inconsistent with resource conservation and even sustainable development principles. Thus, a common question raised is: *should the upland dwellers give up their current practices which are supposed to provide them the subsistence they need to benefit the greater public or national and global stakeholders?* What weight should be given to the interest of the communities who are the direct users vis-a-vis the general public who are remotely situated from the resource? How can a decision be made on the use of SIFR given the interest of these communities? What incentive systems should be in place, if any, to encourage compatible uses among the different stakeholders? How can the resulting land use and management option be designed to minimize any undue negative impact on the social, cultural, environmental, and economic milieu of the SIFR communities?

As part of the stakeholder analysis that SAMBIO designed to determine the "best" option for SIFR management, the Inception Report specified the use of PRA as a tool to learn from the communities, and understand their interests and priorities. These information are basic inputs in drawing up a set of criteria for arriving at a "win-win" solution desired by SAMBIO.

1.2 The PRA Objectives

In the context of SAMBIO's stakeholder analysis, the primary aim of PRA was to identify the communities' priorities for the use of SIFR based on their actual needs and aspirations. This was achieved by purposely selecting a mix of PRA methods and tools (see **Part 2**) that progressively built the information to generate the communities' preference ranking. Such methods and tools were meant to shed light on the following aspects of the SIFR communities:

- Characterization of the community resources, their main uses, and associated problems and prospects for conservation and development of SIFR;
- Diagnosis of existing resource uses and practices in relation to social, economic, cultural and environmental factors that influence communities' needs and aspirations;
- Definition of preference ranking criteria offered by the communities that also reflect local perceptions of SIFR resource values;
- Ranking of communities' preferences for SIFR resource uses; and
- Implications for SIFR management options.

Much of the input for this document came from the PRA conducted by SAMBIO's PRA teams from February to April 2000 in 18 forest dependent communities (barangays).

1.3 The PRA Teams

Using the PRA process described in **Part 2**, each of the three NGOs contracted to conduct the PRA in SIFR communities in every province (Northern Samar, Western Samar and Eastern Samar) formed a PRA research team composed of the following:

Table 1
PRA Research Teams

Northern Samar	Western Samar	Eastern Samar
NGO: Samar Center for Rural Education and Development, Inc. (SACRED)	NGO: Tandaya Foundation	NGO: Eastern Samar Development Foundation, Inc. (ESADEF)
PRA Coordinator: Josephine de Leon Orlando Carlon Ruben Esquillo Jessy Cananga Ciro Magdaraog	PRA Coordinator: Rosario Cabardo Copertino Roluna Emilio Llauderer Bernardina Magos Daisy Jazmin Charita Llanera Rogelio Gabon Abril Tuazon	PRA Coordinator: Evelyn Amit-Corado Jessie Abellar Priscila Fabillar Donabelle Lapezura Rufo Caspe Merlyn Alidon Margarito Guasis Fe Pomida Rodulfo Corado Gemma Rosales

The PRA participants from SIFR communities also formed part of the research teams, who provided much of the information contained in this report. After spending most of the day tending their farms or gathering forest products for subsistence requirements, they kindly

shared three to five hours of their time in the evening with PRA teams in social and resource mapping, transect walk and other PRA activities. In some communities, residents even spent their daytime with PRA teams to complete the entire process as planned during the first-day community assembly.

2. EXPLANATORY NOTES ON PARTICIPATORY RURAL APPRAISAL

2.1 Why PRA?

PRA is a research tool designed to analyze the existing conditions in a rural setting by obtaining information through community participation. It consists of a set of participatory and primarily visual techniques for assessing community resources, identifying community development and conservation problems, and appraising strategic options for solving them. It is distinguished from other participatory research techniques (e.g., rapid rural appraisal) by its advocacy for *reversal of roles* in which the community residents act as *analysts and presenters* and the research team (or outsider) as *initiator, catalyst and learner*. Thus, the members of the local community essentially assume the task of analysis.

The use of graphic representations such as diagrams, figures, maps, tables, etc. created by the community to convey its needs, ideas and priorities legitimizes local knowledge, hence promotes people's empowerment. It also enables all community residents to actively participate in the PRA process, including those uneducated who have often showed high abilities for visual communication or literacy. Moreover, PRA paves the way for residents to express their social and cultural values attached to particular natural resources, including the management alternatives for a forest reserve.

PRA is best suited for a *highly participatory research process*, and *when local knowledge and priorities matter most* in defining socially acceptable management options for the use or non-use of a particular resource. Such research and development attributes formed an important part of SAMBIO's framework of analysis.

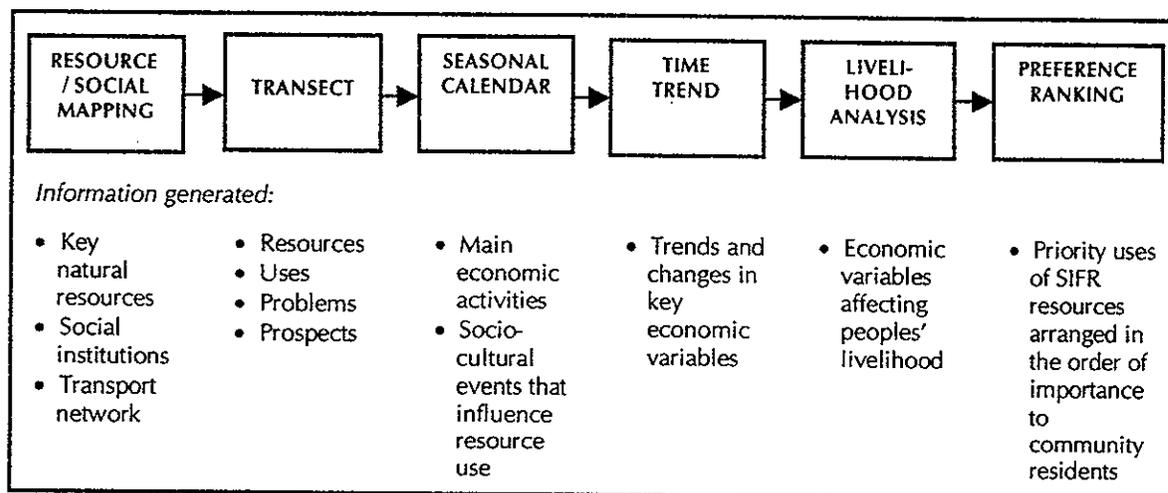
Over the years, PRA has been increasingly applied to needs assessments, feasibility studies, identifying priorities for development activities, formulating community resource management plans, and implementing and monitoring or evaluating development activities. Using PRA, forest and forest-edge communities were given an opportunity to assess, compare, prioritize, articulate and share their preferred resource use and management options for SIFR, while the research team engaged in PRA facilitation and learning process.

2.2 PRA Research Plan

The design and sequence of PRA methods and tools were carefully planned to derive information of direct relevance to the achievement of its primary purpose. The PRA tools were arranged to initially draw up a general picture of SIFR's resources, uses, problems and prospects in each community, as shown in **Figure 1**. Succeeding tools then progressively dealt with other specific PRA objectives - main economic activities, trends/ changes in key economic variables, household-level livelihood assessments based on income sources or assets owned/ claimed, and community's priorities for SIFR resource uses. This sequencing

of tools was also made to build community residents' confidence in the PRA process by starting with the relatively easy ones to the more difficult. However, local contexts dictated the actual tools used in the PRA that suggested a need for resource and social mapping to help the people get started with the PRA process.

Figure 1
Design and Sequence of PRA Tools



The PRA process was generally conducted through workshops and focus group discussions among different social groups (farmers, housewives, loggers, gatherers of non-timber forest products (NTFPs), consumer (*sari-sari*) store owners, barangay officials and students). Reliability and consistency of information were addressed by validation of PRA outputs through key informant interviews and direct observations.

Each of the three NGOs tasked to conduct the PRA in every province (Northern Samar, Eastern Samar and Western Samar) formed a PRA research team consisting of about five members per team. Four of the members served as facilitators, while the fifth member, who has an educational background and field experience in forestry, acted as a resource person. Each NGO also designated a senior officer as PRA coordinator for each province to oversee the actual conduct of the PRA and to review and integrate the PRA outputs and findings.

As a whole, the PRA process involved pre-appraisal dialogues, community assemblies/meetings, the PRA proper, PRA validation, and data analysis. These processes are further discussed below.

2.3 PRA Sites and Participants

PRA was undertaken in eight selected municipalities covered by SIFR that extends over the three provinces of Samar Island, involving 18 forest and forest-edge communities (or barangays), from February to April 2000, as listed in **Table 2**. The PRA sites represented four of the *five agro-ecological zones* identified by the Samar Island Biodiversity Project (SIBP, November 1999). The only zone not covered in the present PRA is Calbiga-Basey region with generally open and degraded land, and with upland areas under the traditional "slash and burn" cultivation.

Table 2
PRA Sites

Province/ Municipality	Barangay	Important Features	SIBP's Agro-Ecological Zone*
<i>Northern Samar</i>			
• Las Navas	Catoto-ogan McArthur San Miguel Taylor	Forests of these sites have not been subjected to any commercial logging in the past.	Northeastern Region (covering Pambujan, Catubig, Dolores and Can-Avid Watersheds, where permanently farmed forest lands are more productive in N. Samar than in W. Samar)
<i>Eastern Samar</i>			
• Arteche	Concepcion		Northeastern Region
• Can-Avid	Balagon Boco Pandol		
• Llorente	Barobo Borak Canduros		Eastern Samar Ridge (covering Suribao and Llorente Watersheds, where sloping upland areas are planted with coconut, banana, vegetables and rootcrops)
• Taft	Del Remedios		
<i>Western Samar</i>			
• Matuguinao	San Isidro Sta. Cruz	Entire municipality rests within what is classified as timberland.	Northwestern Region (covering Gandara Watershed, where permanently farmed forest lands are devoted mainly to coconut)
• San Jose de Buan	Brgy. 2 Brgy. 4		San Jose de Buan Central Uplands (covering large tract of cogonal and brush land that forms as buffer zone of SIFR; habitat of rare and endangered Philippine Eagle)
• Paranas	San Isidro Tenani	Sites where CBFMA has been awarded.	

* Samar Island Biodiversity Project. November 1999, pp 6 & 7.

In the selection of participants, the diversity of social groups was considered more important than the total number of participants. A conscious effort to get representatives of the different groups in the barangay such as *kaingineros*, farmers engaged in permanent farming, loggers, NTFP gatherers, consumer store owners, barangay officials, housewives, and students was emphasized to understand their diverse problems, needs and priorities. This helped avoid the mistakes committed by some PRAs and other research methods that implicitly assumed that the poor rural communities have homogenous populations, often resulting in generalizations of community problems, needs and priorities.

A total of 400 local community residents have participated in the PRA sessions. The salient socio-economic characteristics of these participants are summarized as follows:

Main occupation: swidden farmers: 102 (25%), timber cutters: 12 (3%); non-timber forest products gatherers: 60 (15%), livestock growers: 2 (0.5%), permanent farm cultivators: 150 (37%), traders/sari-sari store owners: 17 (4%), handicraft makers: 3 (0.5%), housewives: 39 (10%), others (students): 15 (4%)

Gender: male: 190, female: 210

Age group of 366 participants (incomplete data): below 15: 3 (1%), 15-30: 85 (23%), 31-50: 168 (46%), 51-65: 93 (25 %), over 65: 17 (5%)

Educational level: about 60% of the participants have primary education, 23% have secondary education, 5% have reached college level, 2% graduated college, and 10% have no school education

Number of children for 102 participants (incomplete data): 1-2: 28 (27%), 3-4: 17 (17%), 5-6: 24 (23%), over 6: 20 (20%), no child: 13 (13%)

2.4 Methodology of PRA

The general sequence of the six PRA tools was followed during the fieldwork to understand community-forest/river interactions in each barangay. Such tools were discussed with the PRA teams and coordinators in a two-day PRA seminar held in January 2000. Variations in the order of tool application were largely determined by local contexts. A brief description of the actual methods and tools used is as follows:

Pre-appraisal dialogues with barangay leaders and residents, a few days before holding the PRA workshop proper, to explain the purpose and process of PRA and the target participants, and build rapport and elicit support.

Community assemblies or meetings were held a few hours after arrival of the PRA team in each barangay to introduce the PRA team members and explain the purpose of PRA. The whole program on PRA was clarified at this early stage to avoid any undue expectations of the community for any forthcoming projects or assistance, or immediate solutions to their problems.

Natural resource inventory immediately followed the community meetings in all barangays covered by PRA in Eastern Samar to help local people in recalling the natural resources such as plants and animals that exist in four micro-ecosystems, i.e. river, lowland cropland, upland farm, and forest. This tool also recorded important use values of the river ecosystem (e.g., water transportation). The participants were divided into four small groups, and each group was tasked to note the relative abundance of natural resources for a specific ecosystem. The resources of each ecosystem were listed on a piece of craft paper and presented to the entire community for immediate validation.

Resource and social mapping was the common first PRA tool used by the teams in Northern and Western Samar to investigate the spatial relationships between resources and between houses and other social institutions in the barangays. Sketch maps made by the community residents provided a rapid understanding of the distribution of community houses, forest lands, *kaingin* and more permanent farms, water, roads and other features of the landscape. These maps also provided the starting point of a sequence of relaxed PRA methods/tools, especially if the maps were seen as part of the learning process. For many of the PRA team members who were relatively new in the application of the methods/tools in a real life situation, the creation of social and resource maps built up their self-confidence

and helped establish greater interaction between the community residents and the team members.

Transects then followed social and resource mapping. Two groups were formed for a walk across the barangay for observing and recording the salient physical and biological features of the community such as land and soil types, different land use zones, topography, water bodies, cultivated crops, natural vegetation, plantations, birds and other animals, houses and other structures. Each group consisted of two to three PRA team members and two to six community members who have volunteered or were recommended for their familiarity with the landscape. One group walked along the east direction from the settlement proper and another towards the west direction, to cover a cross-section of the barangay. The recorded information were incorporated in a barangay transect map, focusing on resources, their main uses, problems and prospects. The transect map was cross-checked for accuracy by other community residents prior to the conduct of the next PRA tool, either in a workshop setting or through focus group discussion. The information for each main land use zone was completed using the social and resource map and/or resource inventory.

Seasonal calendar was prepared for selected cultivated crops, timber and non-timber forest products, and livestock to explore the sequence of typical activities involved in producing them over a period of 18 months, as well as to illustrate changes in one production cycle. It also reflected the pests and diseases of plants and animals raised by the community, the time and labor allocation for production activities, seasonal migration and water sources. Developing the seasonal calendar revealed how much time were spent in producing main cultivated crops, in gathering non-timber forest products such as rattan and wild pigs, in catching freshwater fish, etc. It also provided information on the seasonal constraints and opportunities by diagramming changes month by month throughout the year.

Time trends focused on how key economic variables changed over time. These included changes in cultivated areas for *kaingin* and permanent farming, crop yields, harvest volume of NTFPs (e.g., rattan) and freshwater resources (e.g., fish) per person per day, time and distance to collect NTFPs in the barangay, and prices of selected products. These allowed community residents to visualize temporal changes in resource uses, and explore reasons for such changes.

Livelihood analysis helped understand the relative dependency of barangay households on different resource use activities (e.g., *kaingin* farming, logging, NTFP gathering, animal hunting, livestock production, permanent farming and consumer store operation) for their livelihood. This was accomplished by dividing barangay residents into small groups based on income sources or assets owned/claimed/occupied. Then, each group was asked to record important household and livelihood information: household size and composition, land tenure status, land area by tenure status, animal ownership, proportion of income by source, and average monthly cash expenses per household. In some PRA sites, when a consensus for the basis of socio-economic stratification was reached, the participants worked collectively to generate the information. Cross-checking of information gathered from the PRA sessions was done mainly by the PRA teams through direct observation.

Preference ranking was used to understand local perceptions of the importance of the forest reserve and its different resources/products. This tool proved very useful in learning local people's criteria for preference ranking and their priorities for the management and use of

SIFR. It placed the preferred uses of the forest reserve in rows in a matrix and the criteria for ranking in columns. The participants filled in the boxes with appropriate scores for each row. The total scores for each preferred use were added and compared, to rank the order of preferences by the community residents.

PRA validation was carried out in two stages. The first stage involved an examination of the completeness and consistency of information generated through the different activities and tools mentioned above. A 3.5-day PRA review workshop was held in Catbalogan last April 4 to 7, 2000 to learn from the PRA teams the methods/tools used, processes followed and results obtained. This workshop resulted in the identification of sets of information that needed further confirmation and/or elaboration by the barangay residents. The second stage involved the presentation of clean copies of PRA outputs in the form of diagrams, maps, tables, etc. by the PRA teams at a gathering of selected barangay residents to correct or modify the information whenever necessary based on residents' comments and suggestions.

Data analysis and report writing were made after the second stage of PRA validation to have a more complete set of information. Other secondary data on socio-economic, biophysical, political and historical contexts of SIFR communities were also gathered from barangay and municipal profiles prepared by LGUs concerned. This PRA report is an attempt to synthesize all relevant information.

As reported by PRA teams, the generally high level of community participation gave credence to the appropriateness of the PRA methodology and the resulting rich quality of information generated at the local level. The openness of PRA participants to reveal sensitive information, such as their direct engagement in timber and non-timber harvesting, resulted in a more dis-aggregated classification system of resource uses, definite conservation-livelihood resource conflicts and community development concerns, and more realistic options for resolving such conflicts/ concerns.

3. GENERAL CONTEXT OF SAMAR ISLAND

3.1 Background Information

With an area of 1,342,888 hectares, Samar Island keeps one of the largest lowland tropical rainforests in the Philippines straddling over its three provinces (Northern Samar, Western Samar and Eastern Samar). Intact tropical rainforests measure some 360,000 hectares, or 27% of the island's land area, and consist of diverse populations of endemic, rare, endangered and economically important plant and animal species that are dependent on forest ecosystem as follows (Gee, 1998; Madulid, undated; Tabaranza, 1999):

- 406 endemic species of flowering plants in at least 200 genera and 65 families, with 40 species found only in Samar Island;
- 197 species of birds, or more than 34% of total count for the Philippines, that include the Philippine (Monkey-Eating) Eagle - the world's second largest eagle and a rare and endangered bird in the country;
- 39 species of mammals, or about 23% of total number of mammal species in the Philippines, with 18 species endemic to the country and 7 found only in Samar Island;
- 25 species of reptiles, 10 are endemic to Samar Island; and

- 12 species of amphibians, 5 are endemic to Samar Island.

In addition, many freshwater fish species inhabit the island's major rivers and serve as main protein source for upstream communities, although no systematic inventory and assessment of these species exist to date. The concentration of all these plant and animal species in Samar Island makes it a globally significant biodiversity site, resulting in the government declaration of the tropical rainforests as Samar Island Forest Reserve (SIFR) in February 1996.

The resource and community assessments conducted by DENR and its partner institutions in 1998-1999 to prepare for the Samar Island Biodiversity Project (SIBP) indicated that SIFR biodiversity is under serious threats due to habitat destruction, over-exploitation, chemical/environmental pollution, and weak legal and institutional capacity of regulatory agencies (DENR and LGUs). All these threats were largely linked to man-made activities arising from population growth, economic development, and community expansion which, in turn, created pressures and changes on SIFR uses and resources. A cursory look at the current land use and local economy in the island will shed light on vulnerability of SIFR biodiversity to commerce and community expansion.

This chapter contains information on land use status and socioeconomic condition of Samar Island, which is considered an important input to planning for SIFR biodiversity conservation and development. It includes consolidated data taken from results of PRA conducted in forest and forest-edge communities (*Table 2*) as well as secondary data from published materials.

Following are baseline information about land area, population and administrative units of the three provinces of Samar Island:

Table 3
Land Area, Population and Administrative Units of Samar Island

	Northern Samar	Western Samar	Eastern Samar
Total Land area (ha)	349,798	559,100	433,965
Population (1995)	454,195	589,373	362,324
Number of families	85,369	115,498	67,584
Population density (persons/ha)	1.3	1.1	0.8
Population growth rate (1990-1995)	3.2	1.9	1.8
Number of municipalities	24	25	23
Within the SIFR	3	11	17
Number of barangays	569	951	597
Within the SIFR	26	93	70

3.2 Land Use

The 1996 land classification status in the country (DENR-FMB, 1996) showed that Samar Island's alienable and disposable (A&D) lands comprised around 487,570 hectares, a low 36% of its total land area as compared to its equivalent figures at the regional and national levels estimated at 48% and 47%, respectively. Only Northern Samar has a relatively larger

area of A&D lands that exceeded the island's average, about 42% of the provincial land area. However, Northern Samar has the smallest total land area and highest population growth rate.

Given the rugged, hilly and mountainous terrain of the island interior, the existing A&D lands could hardly be fully utilized for agriculture, residential area, and industry. Flat areas could only be found in coastal fringes and river valleys, but human settlements already occupied most of these areas. The continued increase in population - and the concomitant need for food security and community expansion - has also resulted in agricultural expansion. In the 1991 Census of Agriculture (NSO, 1991), for instance, total land area devoted to agriculture was about 476,514 hectares, or 98% of the island's A&D lands. *Farmed area in Northern Samar was almost twice as large in size as the provincial A&D lands, while it was more than half in Western and Eastern Samar. As SAMBIO's PRA results highlighted, agricultural expansion has moved in the direction of the forest lands.*

Forest lands covered about 855,290 hectares, or 64% of the island's total land area. Among the six types of forest lands, timberland took up 90%, while forest reserve occupied some 2%. Other types of forest lands found in the island include national park, military and naval reservation, and fishpond but altogether they covered a very small area of less than 8% of the total forest lands. Thus, the forest reserve, national park and a large track of the timberland formed part of the SIFR area coverage.

A breakdown of the status of land classification of the three Samar provinces is presented and compared with the regional and national levels, as follows:

Table 4
Land Classification of Samar Island

Land Classification	Philippines	Region VIII	N. Samar	W. Samar	E. Samar
Alienable & disposable land	14,117,244	1,023,715	148,134	196,456	142,982
Forest land	15,882,756	1,119,454	201,664	362,644	290,983
Unclassified	881,157	38,925	-	-	-
Classified	15,001,599	1,080,529	201,664	362,644	290,983
Forest reserve	3,272,912	51,508	11,864	168	1,890
Timberland	10,015,866	1,018,238	188,160	358,224	228,467
National park	1,340,997	4,108	-	840	-
Military/naval reservation	130,330	176	128	-	-
Civil reservation	165,946	862	-	-	-
Fishpond	75,548	5,637	1,512	3,412	626

Source: DENR-FMB, 1996. 1996 Philippine Forestry Statistics

Over the past four decades, community and commerce have also increasingly expanded in upland areas due to the following factors:

- Inability of growing population, marked with a severe poverty problem, to own decent houses and farms in A&D lands,

- Inequitable land ownership distribution,
- The introduction of commercial logging (up to the late 1980s) and mining (up to the mid 1990s),
- Limited employment and livelihood opportunities in the lowlands, and
- Community perception about the 'open access' character of forest lands.

By 1996, close to 60% of the original forest lands were transformed into a mixture of swidden agriculture, brush lands and grasslands, dotted by human settlements, which characterize the typical land uses of forest-edge communities in the island. SAMBIO's PRA results identified seven major uses of forest lands and associated ecosystems as shown below with the types of economic activities conducted by forest-edge communities:

Table 5
Major Uses of Forest Lands and Associated Ecosystems

Forest / Ecosystem	Economic Activities of Forest-Edge Communities
Primary forest	Timber cutting; harvest of rattan, almaciga resin, orchids and other ornamental plants; hunting; source of medicinal plants
Secondary forest	Swidden farming; timber cutting; harvest of wild abaca, bamboo, rattan, almaciga resin; firewood collection; source of herbal plants; hunting
Swidden farm	Mixture of crops (rice, rootcrops such as sweet potato and cassava, coconut, banana, etc.)
Brush land/grassland	Grazing area; coconut plantation; swidden farming
Permanent agriculture	Mainly rice, coconut, corn and banana, with some fruit trees and vegetables
River system	Transport system; fishing; source of irrigation water; bathing and washing; recreation
Settlement (barangay proper)	Backyard gardening and livestock raising

These information illustrate not only the socioeconomic significance of SIFR resources to the development and survival of local communities, but also give hints to the potential threats of current anthropogenic activities on SIFR's biodiversity conservation.

3.3 Local Economy

Basically an agrarian economy, Samar Island derives much of its revenues from farming and fishing. Data from the provincial profiles indicate that agriculture was the main source of income in Northern and Western Samar by about 50-65% of families, followed by non-agricultural enterprises (23-25%) in 1996. Other income sources included share of crops, fruits, vegetables, livestock and poultry, gifts, rent and sustenance activities. In Eastern Samar, however, non-agricultural enterprises served as the main source of income for about 45% of families, followed by other sources (44%) and agriculture (11%).

The three key agricultural crops in each province in terms of area coverage were as follows:

Table 6
Key Agricultural Crops of Samar Island

Northern Samar		Western Samar		Eastern Samar	
1. Coconut	43%	1. Coconut	49%	1. Coconut	64%
2. Palay (rice)	36%	2. Palay (rice)	35%	2. Palay (rice)	30%
3. Corn	10%	3. Tubers	10%	3. Tubers	3%

Source: Ibon Philippines Databank and Research Center, 1996. Ibon Philippines Profile: Region VIII.

Three types of fishing operations exist in the island: municipal, commercial and aquaculture. In 1993, municipal fisheries contributed much to total volume of fish production, ranging from 37% (Western Samar) to 84% (Eastern Samar). In Western Samar, aquaculture was the major producer of fish (47%), mostly located along Maqueda Bay. Commercial fisheries sector provided the least in Western Samar, and ranked second only to municipal fisheries in Northern and Eastern Samar. Inland fishing in rivers and creeks, which provides a source of livelihood for upstream, forest-edge communities, has no existing record.

Non-agricultural enterprises in 1994 mainly involved cottage industries (98%) employing less than 10 persons. The other 2% were considered small-scale manufacturing firms.

Beach tourism, especially in Northern and Eastern Samar, gives another source of livelihood for local residents, but this remains underdeveloped. The island maintains large caves, good waterfalls and high level of forest biodiversity with significantly high ecotourism potential, but also remains untapped at present.

In forest-edge communities of SIFR, the results of SAMBIO's PRA revealed the following sources of livelihood:

- Kaingin farming (shifting cultivation)
- Timber cutting
- Rattan, bamboo and abaca gathering
- Almaciga resin gathering
- Mining (e.g., sand and gravel extraction)
- Orchids and other ornamental plants collection
- Hunting
- Fishing
- Firewood collection
- Permanent agriculture
- Livestock and poultry raising
- Sari-sari store operation

In the past, commercial logging and mining provided main sources of income for many local residents who settled temporarily in operation sites until they had formed barangays or sitios. The imposition of the logging ban moratorium in 1989 and the proclamation of about 360,000 hectares of tropical rainforest as SIFR in 1996, virtually stopped these commercial activities. Consequently, the displaced workers of logging and mining

companies resorted to *kaingin* farming to support their livelihood. Timber cutting for domestic consumption (i.e., house construction or repair), and sometimes for commercial purposes, has become a major part of livelihood activities of forest-edge communities. Although licenses and permits for logging have been suspended, those for rattan gathering continued. In 1993, for instance, 36 rattan cutting permits were granted to individuals and corporations covering an aggregate area of 430,262 hectares, where 68% of the area were located in Northern Samar. Such permits covered a total production quota of about 11.5 million lineal meters of rattan. Rattan grantees, mostly from the town proper, made arrangements with upland community residents to harvest and supply rattan, by types and sizes. The grantees, however, would normally specify the price of rattan, as well as the manner by which the product would be picked up.

3.3.1 Agriculture

As noted earlier, 3-5 main crops such as coconut, palay, tubers, corn and banana dominate Samar Island's agriculture. Coconut covered about 40-65% of cultivated land, while palay took up about 30-35%. The other crops, including tubers, corn and banana, accounted for the remaining planted area (5-25%).

Coconut is grown extensively in both lowland and upland areas, and harvested 3-4 times a year. Palay production in lowland farms, although mostly rainfed, observed two cropping seasons per year (wet: November-January and dry: July-September); while it was generally planted once in upland *kaingin* farms. It is the main staple, and most produce is consumed domestically. However, the island remains not self-sufficient in rice and thus continues to import this staple from Iloilo province.

Corn is grown as a supplementary staple, and usually planted in rotation with palay after the first harvest in *kaingin* area. Tubers (cassava and sweet potato) are largely planted in *kaingin* farms. Of these four crops, only coconut (in the form of copra) is marketed commercially to the nearest municipal markets for cash income. The copra produce is largely brought to a coconut-based oil manufacturing plant in Tacloban City.

The average annual yields of selected agricultural crops in 1993 are shown in *Table 7*.

Table 7
Average Annual Yields of Selected Agricultural Crops in 1993 (metric tons / ha)

	Northern Samar	Western Samar	Eastern Samar
Palay (rice)	1.21	1.17	1.46
Corn	0.94	0.72	1.65
Coconut	1.86	5.00	2.65
Abaca	0.71	1.52	0.80
Banana	10.12	6.59	2.87
Cassava	1.65	4.82	6.83
Sweet potato	1.76	2.38	1.88
Cacao	0.34	0.17	0.46
Calamansi	3.73	7.50	1.55
Eggplant	3.15	5.74	4.35

Source: DA-Bureau of Agricultural Statistics cited in Ibon Philippines Databank and Research Center, 1996. Ibon Philippines Profile: Region VIII.

The existing crop yields for rice and corn have been low due to a shortage of irrigation systems, farm inputs and traditional farming practices. Such low productivity was possibly the main cause of the island's failure to become self-sufficient in basic staples, considering the realizable optimum yields of these crops, as shown in **Table 8**. However, the high average yield of coconut (with the probable exception of Northern Samar) showed the potential of this crop, especially when linkages with food and oil industries could be established.

Table 8
Optimum Yields of Selected Crops

Present Average Yield in Progressive Areas in the Philippines		Target Yield of Agrikultural MAKAMASA	
Palay (rice)	4.9 to 5.3 tons/ha	Palay (rice)	5.0 tons/ha
Corn	3.0 to 3.5 tons/ha	Corn	3.0 to 5.0 tons/ha
		Coconut	2.0 to 4.0 tons/ha

3.3.2 Cottage Industry

In the three provinces of Samar Island, the industries operating in 1997 have been classified as small and medium scale enterprises such as furniture making, machine shops, woodcrafts, and banca making, including cottage industries such as basket, bag and mat making, shell craft, charcoal making, and abaca processing. These industries have used raw material inputs from wood, abaca, vines and shellfish to produce final products. The success and sustainability of these industries would, therefore, depend on the availability and quality of timber and non-timber forest and wetland products.

Available data on the number of provincial industries indicate that a total of 986 small and cottage industries were registered in 1994, with about 98% comprising the cottage industries (i.e., with less than 10 employees). The 2% accounted for the small-scale industries (with 11-99 employees).

3.3.3 Tourism

The intact lowland tropical rainforest of Samar Island, accentuated by its unique natural caves, waterfalls, complex network of river systems, diversity of animal and plant species, and other natural and historical attractions, have been identified by SIBP as potential tourist attractions that could be developed into ecotourism business. Such distinct natural features have not been highlighted in the present tourism offerings of the island, which merely revolved on beaches, annual festivals, and natural/historical places, despite the fact that the recent international ELF Adventure package has focused on unique mountain features, riverways and waterfalls. The potentials of SIFR for conservation, adventure or ecotourism needs, however, should be examined in two aspects: (1) the possibility of misuse of resources already raised by SIBP, that offered also solutions to prevent its occurrence, and (2) the likelihood of commercialization of existing community activities in the guise of promoting native products such as woodcrafts, vine crafts and other similar cottage industries.

3.4 Basic Services

Samar Island has all the basic services in education, health, water, electricity, transportation and communication, including welfare programs, for its constituents as in other similar areas in the country. However, both the availability and quality of physical, material and human resources of these services have been generally low outside of the provincial capital towns and cities, particularly in remote municipalities and barangays such as majority of forest-edge communities (see *Part 4*).

3.5 Financial Resources

Based on the financial statements gathered from the Department of Finance's Bureau of Local Government Finance for the three Samar Island provinces, the main sources of income were the annual internal revenue allotment (IRA) from the national government, business taxes, real property taxes, receipts from economic enterprises, and miscellaneous fees and charges during the period 1995-1997. Samar Island posted an average annual income of about 761.8 million pesos for the period. Of this amount, the annual IRA provided some 92%, indicating the very high dependency of local development planning and implementation from the national government contributions. In contrast, average annual expenditures amounted to some 745.0 million pesos from 1995 to 1997. Approximately 80% of annual expenditures were used for personal services, operating expenses and special projects.

More details about the average annual income, expenditures and IRA for the period 1995-1997 of the island's provinces and pertinent municipalities, as well as the corresponding values for the whole Region VIII, are summarized in *Table 9* below.

Table 9
Income, Expenditure and Internal Revenue Allotment (IRA) of Samar Island
(in million pesos)

	Income			Expenditure			IRA		
	1995	1996	1997	1995	1996	1997	1995	1996	1997
Northern Samar	213.3	230.5	289.0	218.6	221.0	270.0	196.6	221.1	267.4
- Las Navas	10.5	10.5	14.5	9.1	9.1	12.9	10.3	10.3	14.1
Western Samar	240.9	263.8	324.1	236.0	253.4	332.3	225.9	243.4	310.5
- Matuguinao	8.9	9.5	8.2	9.4	9.4	8.6	8.9	9.4	8.1
- San Jose De Buan	8.9	9.4	11.9	8.8	9.5	11.5	8.8	9.4	11.8
- Paranas	16.0	17.7	21.7	15.8	12.2	18.2	15.3	16.3	20.4
Eastern Samar	212.9	212.9	280.0	214.6	-	274.6	192.2	-	253.5
- Arteche	8.1	-	11.0	8.5	-	10.2	7.8	-	10.6
- Can-avid	10.0	-	13.8	9.6	-	13.2	9.5	-	13.1
- Llorente	14.7	-	19.5	12.7	-	17.7	13.5	-	17.1
- Taft	9.6	-	13.4	9.2	-	12.0	9.1	-	12.8
Samar Island	667.0	707.2	911.1	669.1	689.0	876.9	614.7	646.7	831.5
Region VIII	1,411.3	1,547.4	1,909.9	1,381.3	1,495.5	1,836.4	1,225.6	1,315.0	1,640.1

Source: DOF-Bureau of Local Government Finance

All the three provinces have an occasion that their expenditures exceeded income from 1995 to 1997. Among the eight municipalities, Matuguinao (Western Samar) and Arteche (Eastern Samar) have also experienced operating under deficit spending. Matuguinao and San Jose de Buan, both located within SIFR, have practically derived their income from annual IRA given by the national government.

3.6 Significance to SIFR Conservation and Management

The above information imply that the conservation and management of SIFR would need a more comprehensive approach aimed at improving the broader regional economic situation and the current biophysical constraints to agricultural development. The pattern of resource mismanagement on the important biodiversity resource was simply a result of the pressures brought about by the very low economic growth and the limited area available for agricultural production in the lowland areas.

As statistics have shown, Samar Island possesses one of the smallest percentages of potentially productive agricultural lands because of the natural limitations of its landscape (i.e., topography). With only 36 percent of its total land area classified as A&D, almost 98 percent of these lands are now placed under agriculture production. With increasing population requiring additional areas for settlements and other types of urban land uses, one can surmise that the direction of agricultural production over the years has been towards the public lands or timberlands within SIFR.

The natural features of Samar Island pose a natural constraint to improving agricultural productivity through expansion. The very limited A&D lands could hardly be utilized if at all, for agriculture, given the rugged, hilly and mountainous terrain of the island interior. The relatively flat and rolling terrain of the island has been occupied by human settlements. In the absence of efforts to intensify agriculture and provide other economic opportunities for its population, the natural refuge would be towards the upland areas.

Finally, the economic and policy contexts in the lowland areas have remained favorable to the continued influx and agricultural expansion in the uplands. Samar Island provinces have, over the years, consistently been in the list of areas where poverty incidence is high compared to other areas in the country. Basically an agrarian economy, the production from agriculture has produced dismal records - producing only less than 25 percent of the average rice yields compared to other areas in the Philippines, and less than 30 percent of the potential corn yield compared to national average. Surprisingly, given the very low yields, there were very little efforts to diversify the economic base. Moreover, over the years, there has been very little impact on efforts to increase agricultural production. The structural pattern of land ownership has contributed very little to the improvement of the situation of the agriculture economy.

Due to the functional linkages of the threats to SIFR with the broader demographic, social, economic and geographic milieu of Samar Island, there needs to be a parallel approach aimed at:

- Addressing agricultural productivity in what remains of A&D in the lowland,
- Improving land redistribution and ownership, and
- Increasing economic opportunities in the lowland and coastal areas.

Some economic stimuli are also needed to encourage the revival of a relatively lagging economy in the 18 local communities in the three provinces, and to improve the generation of local revenues so that the LGUs can increasingly and regularly provide the basic services to their constituents.

However, the fact remains that there are already about 189 forest dependent communities within SIFR and along its buffer zones. In some cases, these are duly recognized and established communities within the reserve. There is a need, therefore, for an improved settlement planning strategy such that further development and expansion needs of the communities are made compatible with the overall management approaches of the reserve, and yet supportive of the local needs of their residents.

4. HISTORIES AND PROFILES OF PRA COMMUNITIES (BARANGAYS)

This chapter presents the short history, socioeconomic and biophysical information, whenever available, about the 18 forest-edge communities (barangays) that participated in the PRA process conducted by SAMBIO and its partner NGOs. The information is based mainly on secondary sources, and sets to establish the specific local contexts of PRA communities to better understand the relationships between the conservation-livelihood resource conflicts and the community development concerns. The information is organized according to the order of barangays listed in **Table 10** from Northern Samar to Western and Eastern Samar:

Table 10
List of PRA Barangays

Northern Samar	Western Samar	Eastern Samar
Catoto-ogan, Las Navas	San Isidro, Matuguinao	Balagon, Can-avid
McArthur, Las Navas	Sta. Cruz, Matuguinao	Boco, Can-avid
San Miguel, Las Navas	Bgy.2, San Jose de Buan	Pandol, Can-avid
Taylor, Las Navas	Bgy. 4, San Jose de Buan	Barobo, Llorente
	San Isidro, Paranas	Borac, Llorente
	Tenani, Paranas	Canduros, Llorente
		Del Remedios, Taft
		Concepcion, Arteche

4.1 Northern Samar

4.1.1 Barangay Catoto-ogan, Las Navas

Table 11
Community Profile of Barangay Catoto-ogan, Las Navas

Components	Description
Population	251 individuals, 49 households
Land Area	170 hectares
Schools	Incomplete elementary

Components	Description
Health Services	No data
Water Source	Water collection during rainy season; spring water available during dry season 3 km. away from barangay proper
Electricity	None
Organizations	Parent-Teacher Association, Religious Organizations

Barangay Catoto-ogan is a small community with only 49 households and a population of 251 residents. The Catubig and Bulaw rivers provide means to access the barangay, most especially during rainy season. In summer, however, it could be reached only on foot by hiking for 5-6 hours.

The barangay is quite small, with a land area of only 170 hectares. Its residential area is only 2.0 hectares, while the rest are distributed almost equally between agricultural and forest lands. Some 88 hectares are covered by agriculture, while 80 hectares are devoted to forests. These forest areas, in contrast to other upland barangays and adjoining municipalities, have not been subjected to commercial logging in the past.

Being remotely located from the poblacion and urban centers, combined with the difficult access to the area, Barangay Catoto-ogan has very poor access to basic services. There is no school in the barangay that offers complete elementary education. There is only one teacher who teaches alternate grades - grade 1 and 3 for one year and then grade 2 and 4 in the next year. Children have to go to the lowland barangays to continue elementary schooling. It does not enjoy the benefit of electricity at all. Similarly, there are no health service facilities. Worse, only 10% of the residents have toilet facilities. The barangay has no source of spring water for domestic use of its residents. During rainy season, the residents collect surface water, while during the dry season, people have to trek 3 kilometers to reach a spring source. There are no local organizations established to cater to community development needs. The only existing organized groups are the Parent-Teacher Association and some religious groups.

4.1.2 Barangay McArthur, Las Navas

Table 12
Community Profile of Barangay McArthur, Las Navas

Components	Description
Population	225 individuals, 41 households
Land Area	250 hectares
Schools	Incomplete elementary
Health Services	No data
Water Source	Spring located 1 km from the barangay proper
Electricity	6-10 pm only, supplied by local power generator
Organizations	Parent-Teacher Association, Religious Organizations

Barangay McArthur is another small community comprising of only 41 households and a population of 225. It is located 8 kilometers from the town proper and can be reached by traversing the Catubig River.

Out of its total land area of 250 hectares, a measly 1.5 hectares are allocated for residential purposes, while around 180 hectares or 72% are devoted to agriculture. About 67.5 hectares, or 27% of its area, are still considered forest land. Interestingly, these forest areas have not been logged by any logging company in the past.

As part of the municipality located in one of the northernmost borders of SIFR, Barangay McArthur has not been reached by most basic services of government. In education, for example, there is only one teacher available who teaches alternate grades similar to that case in Barangay Catoto-ogan. Students would have to go down to the lowland barangays if they are to continue schooling. There is no health center, and only some 10% of the households have toilet facilities. To have access to potable water, the residents have to walk 1 kilometer from the barangay proper to fetch water from a spring source.

Residents enjoy the benefit of electricity only four hours in a day from 6-10 in the evening, supplied by a local power generator. The barangay has a low level of organizational capability for development, having only the Parent-Teacher Association and religious organizations as organized groups in the locality.

4.1.3 Barangay San Miguel, Las Navas

Table 13
Community Profile of Barangay San Miguel, Las Navas

Components	Description
Population	993 individuals, 192 households
Land Area	466 hectares
Schools	Complete elementary education with a day care service center
Health Services	No data
Water Source	Spring with pipelines installed to distribute water
Electricity	6-10 pm only, supplied by a local power generator
Organizations	San Miguel Farmers' Association, Parent-Teacher Association, Religious Organizations

Barangay San Miguel is the most populated barangay among those covered by PRA in Northern Samar. It sits in the boundary of Northern Samar and Jipapad, Eastern Samar. Located 24 kilometers from the town proper, it could be reached by boat via the Catubig River. This trip takes almost 4 hours by motor boat. The 994 residents of the barangay are organized into 192 households.

The barangay occupies a land area of 466 hectares with settlement area of only 3.5 hectares. The rest is roughly divided in half between agricultural and forest lands - 236.5 hectares and 226 hectares, respectively.

Barangay San Miguel is relatively better served than the other three Northern Samar upland barangays covered by PRA. It is the only barangay that has complete elementary education facilities comprising a multiple grade system with three teachers. There is also a day care service center in the barangay.

It is also the only barangay that has an existing spring development wherein faucets are installed in every corner within the barangay. It is served by electricity four hours a day (6-10 p.m.) from local power generators. There is an existing community organization - the San Miguel Farmers' Association - which was established with the help of the LGU.

4.1.4 Barangay Taylor, Las Navas

Table 14
Community Profile of Barangay Taylor, Las Navas

Components	Description
Population	726 individuals, 125 households
Land Area	650 hectares
Schools	Incomplete elementary
Health Services	No data
Water Source	Spring 1 km from the barangay proper
Electricity	6-10 pm only, supplied by local power generator
Organizations	Hinaga River Environmental Protection and Development Association, Parent-Teacher Association, Religious Organizations

Barangay Taylor is located some 6 kilometers from the town proper and can be reached through motor boat via the Catubig River. It is a community of 125 households and 726 residents.

The barangay covers the largest land area among the four PRA sites in the province. With a total land area of 650 hectares, it has some 3.0 hectares used for residential purposes and 345 hectares for agricultural uses, while some 302 hectares remain as forest lands. It should be interesting to note that the forests have not been subjected to any form of commercial logging in the past.

One teacher presently serves the educational needs of the children in the barangay. This teacher handles alternate grades - grade 1 and 3 for one year and then grade 2 and 4 in the next year. To continue elementary schooling, the children will have to go to the lowland barangays where this is available. The potable water source of the residents come from a spring, located about 1.0 kilometer from the barangay proper. The barangay is served by electricity only four hours a day (6-10 p.m.) which is supplied by a local power generator. Interestingly enough, there is an existing community organization - called the Hinaga River Environmental Protection and Development Association (HEREDERA). This organization was organized by an NGO, and involved in implementing a DENR-ADB funded project that sought to protect, conserve and manage the Catubig Watershed sub-project.

4.2 Western Samar

4.2.1 Barangay 2, San Jose de Buan

Table 15
Community Profile of Barangay 2, San Jose de Buan

Components	Description
Population	472 individuals, 109 households
Land Area	
Schools	Grades 1 and 2 only
Health Services	Provided through health personnel from the Poblacion
Water Source	Faucets, deep well, and spring
Electricity	
Organizations	none

Barangay 2 is a poblacion barangay located within the municipality of San Jose de Buan, one of the interior municipalities of Samar. It is located in what is still classified as timberland.

The barangay is surrounded by Mt. Huraw, one of the tallest mountains with an elevation of 840 meters above sea level; and smaller mountains like Bukid Hinagdaan at the boundaries of Eastern Samar and San Jose de Buan.

Barangay 2 has a total population of 472, or 192 households. The main source of livelihood of community residents is *kaingin* farming.

The residents of Barangay 2 benefit from the services of health personnel (municipal nurse and four barangay health workers) detailed at the poblacion. These personnel provide family planning, immunization, child and mothers' clinic, and nutrition program services. The barangay offers education for grades 1 and 2 made possible through one teacher. Water supply is available from faucets, deep well and spring.

4.2.2 Barangay 4, San Jose de Buan

Table 16
Community Profile of Barangay 4, San Jose de Buan

Components	Description
Population	748 individuals, 158 households
Land Area	385 hectares
Schools	None
Health Services	Health center, with two barangay health workers
Water Source	
Electricity	Local power source supplies 25% of households
Organizations	Samahan ng Kababaihan, Magsasaka, Manggagawa at Industriya (SKKMI)

Barangay 4 is a poblacion barangay of San Jose de Buan, Western Samar. The whole municipality is located within the Samar Island Forest Reserve. The barangay is 300 meters northeast of Mt. Huraw, considered the highest elevation in the province. Different secondary forests such as Bukid Lala-an in the north, Kalongkagong in the west, Kaluy-ahan in the south, Talingagao in the southeast area, and Kasarawagan surround the barangays and the whole municipality.

The total land area of Barangay 4 is 385 hectares. Forty percent of this area is considered secondary forest while the remaining 60 percent are considered open and abandoned *kaingin*, with a cluster of trees. The forest areas of Barangay 4 are secondary and primary or old growth forests. Mt. Huraw as a primary or old growth forest is considered a wilderness area. It has been spared from small and large scale logging due to its steep slopes. The secondary forest is located in the northeast and south portion of the barangay. This area has been logged and currently being logged by residents of the municipality for domestic purposes.

Barangay 4 has a population of 748 individuals organized into 158 households. It has a health center with two barangay health workers. Forty percent of the households have sanitary toilets. School children from the barangay attend classes in the municipality of San Jose de Buan. Twenty five percent of the households have electricity supplied from a generator. There is only one organization in the barangay - a women's group called Samahan ng Kababaihan, Magsasaka, Manggagawa at Industriya (SKMMI). Although registered with the Cooperatives Development Authority, almost all its members are inactive.

4.2.3 Barangay Sta. Cruz, Matuguinao

Table 17
Community Profile of Barangay Sta. Cruz, Matuguinao

Components	Description
Population	140 individuals, 26 households
Land Area	
Schools	None
Health Services	Visits from Municipal Health Workers once every 3 mo.
Water Source	
Electricity	
Organizations	

Barangay Sta. Cruz is part of the municipality of Matuguinao, one of the interior municipalities in Western Samar. It can be reached in almost one and a half-hour hike along a trail crossing three creeks and a bridge made of coconut logs. In addition, one has to cross the winding Bag-ot River (10 meters in width) five times.

The barangay is located in what is still considered timberland. It is bounded by secondary forest, a source of timber for building houses in both the municipality of Matuguinao and barangay Sta. Cruz. Aside from illegal cutting using chain saws, the secondary forest is also open to *kaingin*, some of which have been abandoned due to low soil fertility.

Barangay Sta. Cruz is a small community with a total population of only 140 residents or 26 households. The barangay residents are not served by any local health facility. The nurse and midwife from the municipality of Matuguinao visit the barangay once every three months to provide family planning services, anti-tetanus vaccinations for pregnant women and other vaccinations. The sanitary condition of the residents is so poor, with only one household having a toilet facility. Schoolchildren from the barangay attend classes in nearby barangays and the municipality.

4.2.4 Barangay San Isidro, Matuguinao

Table 18
Community Profile of Barangay San Isidro, Matuguinao

Components	Description
Population	339 individuals, 64 households
Land Area	
Schools	One school building for grades 1 and 2
Health Services	Dilapidated health center; visits of health personnel once every 3 mos.
Water Source	Spring, 1 kilometer away
Electricity	None
Organizations	

Barangay San Isidro is one of the interior barangays of the municipality of Matuguinao. It is located in what is still classified as timberland. Surrounding the barangay are the Bukid Maharas in the south, Polangi in the west, Sarawag Mountain in the north, and Bukid Manurukdok. All of these are covered with secondary forest.

The barangay has some 64 households and 339 residents. San Isidro has one school building with two grade levels, grades 1 and 2, with one teacher alternately teaching the combined grades. Classes are held twice a week only. The barangay has very poor access to health services. Medical personnel such as the municipal nurse and midwife visit the barangay only once every three months. The source of water in the barangay is a spring in Bukid Manurukdok, which is a watershed area, and is a kilometer away from the barangay. There is only one faucet, but was destroyed by floods that hit the area. The community's new source of drinking water is now 200 meters away. In 1999, the community was able to have electricity, which was donated by a Congressman, but became functional for only a week.

4.2.5 Barangay Tenani, Paranas

Table 19
Community Profile of Barangay Tenani, Paranas

Components	Description
Population	1,122 individuals, 228 households
Land Area	
Schools	Complete elementary
Health Services	Visits from midwife once a month
Water Source	Panganahawon Creek, distributed through water pipes

Components	Description
Electricity Organizations	Tenani Association for Progress (TAP); Rural Improvement Club (RIC)

The area is one of the barangays that form part of the wildlife corridor proposed in the Samar Island Biodiversity Project. It is also the site of coal and manganese mining. The barangay is the buffer zone of the San Jose TLA area with secondary and old growth forests. For this reason, the barangay was also selected by the Foundation for Philippine Environment as a pilot area for its Community Forestry Program. The area has also been the site of floral collection by the National Museum and has been covered by a biodiversity study by UP Los Banos. Despite the above initiatives, the barangay is still considered a hotspot for illegal logging.

The barangay has a total of 228 households and 1,122 residents. Education for schoolchildren is made possible through a public school facility consisting of two buildings with five rooms accommodating the six grade levels. For the health needs of the community members, there are four barangay health workers and a trained *hilot*. A midwife from the poblacion visits the barangay every first Monday of the month. The community residents have a good water system sourced from Panganahawon creek, located some two kilometers away. Water is distributed through water pipes.

Having received assistance from outside organizations, there are existing organized groups in the area. One is the Tenani Association for Progress (TAP) with 43 members, which, together with a nearby People's Organization in San Isidro, was awarded a CBFMA covering 6,500 hectares. Another organization is the Rural Improvement Club with 20 members. Its members are active and are currently involved in livelihood activities such as production of Insumix and processing of peanut butter and banana chips.

4.2.6 Barangay San Isidro, Paranas

Table 20
Community Profile of Barangay San Isidro, Paranas

Components	Description
Population	780 residents, 149 households
Land Area	
Schools	Complete elementary
Health Services	Through Barangay Health Workers
Water Source	Spring from a nearby cave
Electricity	Samar II Electric Cooperative
Organizations	Basaranan nga Organisasyon han San Isidro (BOSIS)

Barangay San Isidro is found in an area where the proposed wildlife corridor is to be established. The barangay has old growth and secondary forests. There are also open and abandoned *kaingin* areas within the barangay. There is open access to small-scale logging, timber poaching, and extraction of non-timber forest products because of the area's accessibility to any type of transportation.

The barangay has a total population of 780 residents or 149 households. The community has two barangay health workers who assist the residents in their immediate health needs. A midwife from the poblacion visits every first Monday of the month. Electric power is supplied by the Samar II Electric Cooperative (SAMECO) which was installed in 1996. Water supply comes from a spring in the nearby cave.

Barangay San Isidro has complete elementary grades with five teachers. It has two school buildings with five rooms.

The barangay is one of the two barangays that form the site of the Community Forestry Program. As a result, the Basaranan nga Organisasyon han San Isidro Samar (BOSIS), was formed. Together with another People's Organization based in Tenani, the organization was awarded a CBFMA covering an area of 6,500 hectares of forest land.

4.3 Eastern Samar

4.3.1 Barangay Balagon, Can-Avid

Table 21
Community Profile of Barangay Balagon, Can-Avid

Components	Description
Population	347 individuals, 62 households
Land Area	760 hectares
Schools	1 elementary school, no high school
Health Services	1 barangay health center
Water Source	
Electricity	Only the church, barangay hall and plaza are serviced by electricity
Organizations	

Balagon is probably the oldest among all the covered PRA sites in Eastern Samar. It is believed to be already in existence during the Spanish time. Balagon means vines in the vernacular and connotes power because it climbs and lives even if it has no roots on the ground. The oldest settlers were composed of seven families. Later, the community members opened trade with some Manobo tribe members who visited the barangay. Since the 1970s, the community saw itself suffering from calamities and other setbacks. During this period, there were massive destructive floods that ravaged the barangay. In the 1980's, the barangay became one of the hotbeds of the New People's Army (NPA) which drove its residents to evacuate in the poblacion where they established their houses. Clashes between the NPA and the military were at its highest in 1984. Today, the residents still fear the two forces asserting their presence and control of the area.

Balagon is a community comprising 62 households and 347 residents. With a land area of 760 hectares, its population density stands at a low of 0.45 persons per hectare. Its water source comes from a nearby spring. Support from the government enabled the installation of pipes and several communal faucets strategically located throughout the barangay. Its health services are provided through visits of medical personnel, although the lack of

medicines is a perennial constraint. Schooling of children is made possible through a local elementary school.

4.3.2 *Barangay Boco, Can-Avid*

Table 22
Community Profile of Barangay Boco, Can-Avid

Components	Description
Population	369 individuals, 67 households
Land Area	850 hectares
Schools	Complete elementary
Health Services	Visits of medical personnel
Water Source	Spring with communal faucets in key areas of barangay
Electricity	
Organizations	

The barangay is said to have been discovered by two families - Julianes and Legria - who settled near the creek named Boco. As additional settlers inhabit the community, they were attracted with the opportunities in the Olot River, encouraging them to settle near its banks. The residents of Boco maintained active trade with some members of the Manobo tribe from Mindanao, especially in wild animals and other forest products. The entire community was ravaged by fire in 1974. In 1994, the atrocities of the Philippine Army forced the residents to evacuate and leave their homes and farms only to come back a year after. Today, the residents are still visited by both the NPA and military from time to time.

Barangay Boco occupies a land area of 850 hectares. It consists of some 67 households, with a population of 369. Although there is no health center, there are services provided through visits of medical personnel. Potable water is supplied from a spring, made available to households through communal faucets strategically located in key areas in the barangay. An elementary school serves the educational needs of the barangay's children.

4.3.3 *Barangay Pandol, Can-Avid*

Table 23
Community Profile of Barangay Pandol, Can-avid

Components	Description
Population	542 individuals, 88 households
Land Area	414 hectares
Schools	Complete elementary
Health Services	None
Water Source	Spring, distributed through communal faucets
Electricity	
Organizations	

The early settlers of Pandol were evacuees from Casandig and other areas of Samar. Compared to other barangays, Pandol was very peaceful and therefore was attractive to evacuees. It is another community located along the riverbank. Its rich old growth forests has attracted monkey hunters. The heightened operation of the NPAs in 1981 forced the

residents to evacuate and establish residence in the poblacion. This situation continued until 1986, such that the school was closed due to absenteeism. Since the early formation of the barangay, the residents have acknowledged the importance of Olot River as source of fish to balance their rootcrop-based diet.

The barangay is a community of 542 residents organized into 88 households. It has a land area of 414 hectares, consisting mainly of old growth forests. There is no health service facility, but an elementary school serves the educational needs of the children. The residents source their potable water from springs, supplied through communal faucets located in strategic positions in the barangay.

4.3.4 Barangay Barobo, Llorente

Table 24
Community Profile of Barangay Barobo, Llorente

Components	Description
Population	1,148 individuals, 132 households
Land Area	970 hectares
Schools	Complete elementary
Health Services	A health facility
Water Source	Through the Municipal Solar Infrastructure Project
Electricity	Through the Municipal Solar Infrastructure Project
Organizations	

The barangay acquired its name from a tree species named "barobo" abundantly growing in the area in earlier times. Its first settlers came from the Poblacion (town proper), formerly called "lanang", now called Llorente. The first inhabitants were the families of Barobo, who were hunters of wild pigs, which served as the main source of food and income.

Barobo is a community of 1,148 residents organized into 132 households. It occupies a land area of 970 hectares, a size relatively small compared to other upland barangays covered by PRA. It has an elementary school and a health facility. The barangay is one of the few which have a relatively large number of toilet facilities compared to the total number of households. Electricity and water is made possible through the municipal solar infrastructure project. While the project was designed to service also the needs of other adjacent barangays, only the facilities in Barobo and Borac are presently functional.

4.3.5 Barangay Borac, Llorente

Table 25
Community Profile of Barangay Borac, Llorente

Components	Description
Population	323 individuals, 66 households
Land Area	3,737 hectares
Schools	Complete elementary
Health Services	
Water Source	Through the Municipal Solar Infrastructure Project

Components	Description
Electricity Organizations	Through the Municipal Solar Infrastructure Project

This barangay used to be thickly forested and a good hunting area. It was named after the "Borac" tree species. Borac was also the alias (nickname) used by Lucio Barbo, who, during the Spanish time, was rebellious against the colonial government's voluntary servitude and was hunted. As a fugitive and a farmer, he worked on his vast tracts of land. When his children got married, he donated a portion of his cultivated land and this became the settlement area or barangay proper. The barangay was officially named after him in 1961 to honor his noble intentions for the residents.

Borac is one of the few large barangays, occupying a total land area of 3,737 hectares. It has a very sparse population of only 323, consisting of 66 households. The barangay is served by an elementary school, and has available water system and electricity. Power and water are provided through the Municipal Solar Infrastructure Project.

4.3.6 *Barangay Candoros, Llorente*

Table 26
Community Profile of Barangay Candoros, Llorente

Components	Description
Population	452 individuals, 60 households
Land Area	4,500 hectares
Schools	
Health Services	
Water Source	Through the Municipal Solar Infrastructure Project
Electricity	Through the Municipal Solar Infrastructure Project
Organizations	

The barangay was once a thickly forested area where wild pigs abound. Its early inhabitants were migrants from Gen. McArthur who cultivated large areas of farms. The barangay got its name from the word "naduros", a local term which refers to a land mass erosion in the riverbank that occurs during floods.

Barangay Candoros sits in a vast area of 4,500 hectares. It is sparsely populated, with only 452 residents and 60 households. A foreign assisted project called the "Municipal Solar Infrastructure Project" provided power for electricity and for the tanks supplying water to the barangay.

4.3.7 *Barangay Del Remedios, Taft*

Table 27
Community Profile of Barangay Del Remedios, Taft

Components	Description
Population	559 individuals, 103 households
Land Area	1,264 hectares

Components	Description
Schools	Elementary school
Health Services	No health facility
Water Source	Jetmatic pump supplying all households
Electricity	No electricity
Organizations	

The barangay was named after "Remedios", the wife of former Taft Mayor Sitoy Cebreros. Del Remedios was first known as Upper Danao of Barangay Danao. The wife's forefathers were the early settlers of the area. Having great influence as the wife of the town Mayor, she facilitated the formation of Upper Danao into a barangay, named after her. Del Remedios is a timber area but is slowly turning into a farmland with rice and coconut as major crops. For twenty years, it did not have a school until after last year.

This is a barangay inhabited by 559 individuals or 103 households occupying a land area of 1,264 hectares. Water is made available through a jetmatic pump that is enough to supply all the households in the barangay. However, it does not have any electricity at all. Of all the barangays covered by the PRA, this barangay is the least privileged in terms of basic services. There is no health facility available, and its sanitation condition can be considered as the worst, with only three households out of the total of 103 having toilet facilities.

4.3.8 Barangay Concepcion, Arteche

Table 28
Community Profile of Barangay Concepcion, Arteche

Components	Description
Population	1,219 individuals, 230 households
Land Area	2,000 hectares
Schools	Complete elementary and high school
Health Services	No health facility
Water Source	Several jetmatic pumps using water from underground sources
Electricity	Power generators operated by private individuals
Organizations	

The first settlers of Barangay Concepcion were the families of Donceras from Oras. Concepcion was the name given to the barangay in honor of the Immaculate Concepcion. The early settlers cultivated the areas and developed farmlands. The church and the school were built in 1931. During the war (1944), its residents evacuated and later returned to claim their lands. Similar to other upland barangays, Concepcion residents have experienced trading with members of the Manobo tribes until 1986. Manobo tribe members traded baskets and rattan with residents of the barangay proper. This relationship with the Manobos turned sour later when the Manobos harvested their farm products and took valuable items from the residents' houses. The first mode of transport available in the barangay was "tabaw", a bamboo raft. Using this raft, it took almost one week to reach Concepcion from Oras town proper.

4.4 A Summary

The profiles and histories of the barangays covered by PRA share some common elements. First, the histories reveal that all early settlers of these communities were migrants from the lowlands, apparently in search of fertile lands and/or whatever available lands for settlement and cultivation. During the Spanish times, these lands were considered the frontiers - very productive and yet available for anybody's taking. This situation exemplifies the open access perception of the communities towards the resource. In some situations, the communities were products of the "pull" factors associated with the operation of logging and mining companies that were granted authority to extract resources from the SIFR.

Secondly, the profiles tell us that these communities are basically forest resource dependent - majority of which basically derives their subsistence from this resource. They have no other livelihoods nor skills unrelated to farming and forest resource gathering. As small communities, they have practiced upland agriculture and have adjusted their patterns and practices in accordance with the dictates of resource availability, seasonal abundance and calamities, as well as seasonal needs and priorities. Typically, the pattern of resource use has closely followed the dictates of such needs.

Finally, the communities are largely wanting in terms of basic services, being very remotely located from the poblacion or municipal centers. Accessibility is very difficult, made easier only by the long and expanded network of river systems in the SIFR. A typical household suffers the hardships of lack of access to basic education, water, health, electricity, and other necessities for decent living.

5. SIFR RESOURCES AND USES

5.1 Ecological Zones

Resource inventory, resource and social mapping, and transect diagramming were the three PRA tools employed to look at the specific SIFR resources and uses in the forest-edge communities. These tools revealed five to seven ecological zones classified by the local residents with respect to the main uses of natural capital within their specific contexts. The ecological zones were normally drawn in the transect following the natural outline of an area's landscape¹, as simply illustrated in *Figure 2*.

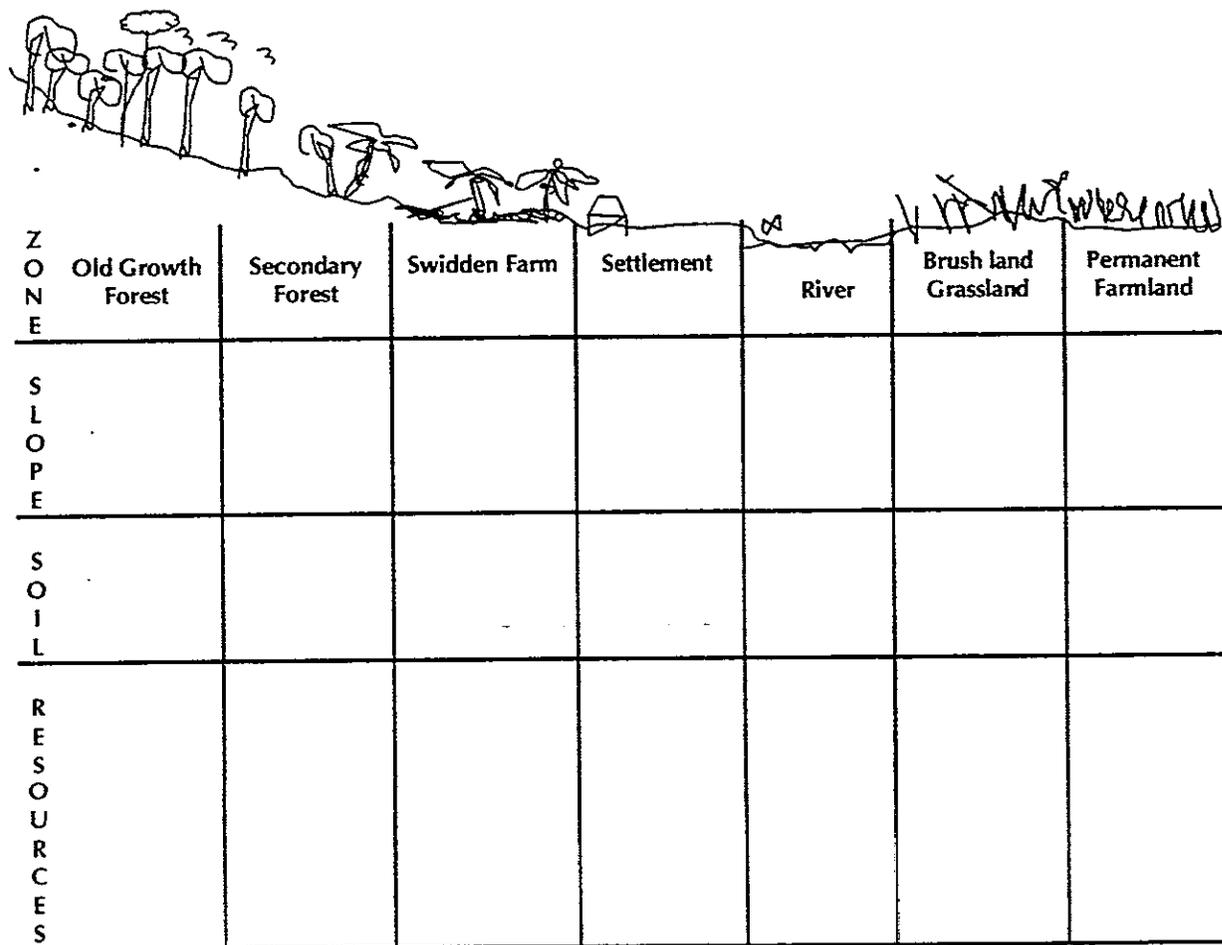
5.1.1 Old Growth Forest

The old growth forest, in contrast to other ecological zones, contributes to the maintenance of vitally important water supplies in majority of forest-edge communities dependent mainly on natural spring for domestic uses. This function was found most critical especially to the communities in Northern and Eastern Samar. Fortunately in Northern Samar, according to the PRA participants, the old growth forests in their communities have not been subjected to commercial logging in the past, although some of them engaged in

¹ Transect diagramming was done by showing the landscape with the highest elevation west of the barangay proper which the transect team had observed or learned during the transect walk, down to the lowest portion or river system and then stopping at the other highest elevation in the eastern side.

small-scale harvesting of timber, primarily for house construction/repair and domestic furniture making (chairs and tables). In Western Samar, such as in Barangay San Isidro in Paranas, timber cutting by the local residents involved selling to outside buyers who, in turn, finance the purchase of some small chain saws used by local loggers in exchange for a 'steady' wood supply.

Figure 2
PRA Transect Diagram



Some of the most important forest tree species found in the old growth forest of the local communities belong to the families of *Dipterocarpaceae* (e.g., Almon, Apitong, Bagtikan, White/Red Lauan and Yakal), *Anacardiaceae* (e.g., Dao), *Araucardiaceae* (e.g., Almaciga), *Leguminosae* (e.g., Narra). The long list of plant and animal inventory by major ecological zone prepared by PRA participants, however, showed more tree species other than those just cited, but the use of local names in species identification would initially require translation into common names. Palm, bamboo, vine and ornamental plant species were also identified, so were the important animals commonly observed or known to exist in the locality by participants in the course of the PRA process. An estimate of the number of forest plant and animal species extracted from the resource inventory and transect diagram is shown in the next section.

5.1.2 Secondary Forest

The secondary forest largely resulted from extensive commercial logging operations in Samar Island until the late 1980s and from the opening of swidden areas for palay, coconut and rootcrop cultivation by the growing population of forest-edge communities. Since the suspension of commercial logging, local residents have observed the progressive growth of Dipterocarp and other hardwood species in secondary forest over the last ten years. In fact, many of the plant and animal species enumerated under the old growth forest were also told by PRA participants to exist in secondary forest.

Small patches of this forest (with less than 1 hectare), typically facing the barangay central, have been used for swidden farming to increase crop production in relatively fertile soil, as the old farms were under fallow period. As observed from afar, some permanent crops were grown in swidden areas along with the primary subsistence crops such as palay. After 2-3 cropping seasons, the swidden farmers moved to new areas, leaving behind the permanent crops to serve as marker of their claim over the parcels of forest land that they would reopen after the fallow period. According to the PRA participants, fallow period traditionally lasted for 8-10 years, but has recently been reduced to 3-5 years due to competition among local residents for crop cultivation areas. Limited potential expansion areas for crop growing within the secondary forest, accentuated by the distance factor, have also contributed to the shortening of fallow period. In communities where the same forest areas are frequently used for swidden farming and where more coconuts, bananas, rootcrops and fruit trees are planted, local residents no longer considered these areas as secondary forest, but swidden farm.

5.1.3 Swidden Farm

Although legally classified as forest land, swidden farm has locally earned a distinct image among local farmers as more resistant to adverse climate conditions (such as extended rains or drought caused by the La Nina or El Niño phenomenon) than lowland agricultural farms. At the time of the PRA, many barangays located along major rivers were not able to plant rice and other crops in their agricultural lands due to flood problems. Crop production has become concentrated in upland swidden areas to sustain domestic food requirements. Even during summer, the rainfed condition of many agricultural lands also favored the swidden areas with its close proximity to the major sources of irrigation water, being situated in the upper stream of major river systems. This important function of swidden farm to the food security and survival objectives of forest-edge communities has developed it into a distinct third category of ecological zone, rather than simply another type of land use.

As an ecological zone, swidden farm exhibits generally random mixtures of staple food crops (rice, corn and rootcrops), cash crops (coconut and banana), fruit trees (jackfruit) and few timber and non-timber products (lauan, guisok, malatuba, wild abaca, rattan and nito). In the same area, grasses (cogon, lukdo, puti and tigbaw) are also interspersed with coconut and staple food crops, or inhabited idle and open areas. The introduction of more perennial high valued crops such as abaca and coffee in swidden areas could transform these into more or less permanent farms. However, swidden farms could be distinguished from the permanent farmland located in plains and rolling hills due to the absence of rice paddies that are typical of the latter farm type.

5.1.4 Human Settlements

As the fourth ecological zone, human settlements in forest-edge communities were built in a more contiguous area to achieve effective interaction among the residents, and between them and the outside world (other barangays and municipalities). Hence, main barangay settlements are located along major river systems which serve as primary or supplementary transport network, particularly during rainy season when hiking to reach municipal centers involves crossing of rivers and creeks that pose danger to one's life. Many of the households in these settlements have backyard vegetable gardens, fruit trees including cacao and coffee, and forest trees. The more common vegetables grown in gardens were ampalaya, eggplant, okra, patola, stringbeans, and upo. A variety of fruit trees were also recorded such as jackfruit, star apple, citrus, mango, banana, igot, lansones, and rambutan. The fruit trees grown by every household varied, but the number of each kind ranged generally from one to three trees. Most of these crops were produced for domestic consumption. Among the forest trees planted in settlement backyards were species of gmelina, acacia and narra. Livestock and poultry (pigs, goats, carabaos, ducks and chicken) raising was also a practice in these settlements, and possession of these animals was sometimes considered a symbol of high economic status. With perhaps the exception of carabao, the animals were slaughtered and served during fiestas and other important events.

5.1.5 River System

River system, the fifth ecological zone, has served several important functions for forest-edge communities that include: main water transport network; fishing ground for freshwater fish, shells, shrimps and crabs; bathing and washing of clothes; mining of sand and gravel; and source of irrigation water. Fifteen of the 18 barangays covered by PRA have adjoining rivers that have been serving the residents for the transport of their farm products from their communities to municipal centers. Rivers also served most of the students enrolled in higher elementary (grades 5 and 6), secondary and tertiary levels in major towns of Samar Island. Freshwater fishing has been the other major function of the rivers with the presence of considerable number of fish, shell, shrimp and crab species.

Based on the PRA resource maps, the major rivers adjoining or traversing the forest-edge communities were:

Table 29
Major Rivers Located Near Forest-Edge Communities

Northern Samar		Western Samar		Eastern Samar	
River	Barangay	River	Barangay	River	Barangay
Bolao	Catoto-ogan	Ulot	San Isidro	Ulot	Boco
Hagbay	San Miguel		Tenani		Balagon
Hinaga	Taylor	Bag-ot	San Isidro	Lanang	Candoros
		Gandara	Santa Cruz		Borak
		Blanca Aurora	Barangay 2	Kigad	Barobo
				Del Remedios	Del Remedios
				Oras	Concepcion

Northern Samar	Western Samar	Eastern Samar
<i>Total # of barangays with adjoining rivers</i>		
3 out of 4	5 out of 6	7 out of 8

5.1.6 Brush Land/Grassland

Brush land/grassland, the sixth ecological zone, represented the rocky and clayey area of the communities that formed part of the forest land. Like most secondary forests, this zone used to be covered with forest vegetation but commercial logging or mining has transformed this into its current landscape. Dominated by grasses and shrubs, this zone has not been productively used by local residents in recent years, except for scattered pockets of swidden areas already abandoned or under fallow period that maintained a few coconuts, palms, vines and small trees. This particular zone was mainly observed in Barangay San Isidro in Matuguinao, Western Samar.

5.1.7 Permanent Farmland

Finally, permanent farmland could be characterized by the presence of rice paddies in flat and rolling areas, usually near human settlements or the barangay center. Rice, corn, banana, coconut and rootcrops dominated this zone's vegetative cover. Other crops grown in this zone were abaca, pineapple and fruit trees such as jackfruit and mango. Farming practices remained traditional, and almost all the produce were consumed locally. Incentives to improve farm productivity were low. Generally poor transport system and high transport cost have possibly discouraged local farmers to invest more time and effort for increasing crop yields.

5.2 Natural Resources and Land Use

Preliminary estimates of the natural resources found in each ecological zone in the 18 PRA sites are presented here through the use of simplified transect diagrams. Since local names were used to identify the resources, enumeration and classification of plants (say, into forest trees, bamboo, palms, vines, orchids and other ornamental plants, etc.) and animals (say, birds, mammals, reptiles, amphibians, including fishes, shells, shrimps and crabs) were not possible due to unfamiliarity with the local dialect. Thus, the estimated number of these resources have been used instead of the usual presentation of a transect diagram reflecting the names of different resources.

The list of resources was derived from the results of the application of three PRA tools mentioned earlier. As a way of presenting the natural resources, the transect diagram was selected due to its direct usefulness as a management tool in conserving and developing resources according to ecological zone. By examining this diagram, managers and planners can determine which zones are under severe stress from overuse or destruction of resources and thus focus their efforts on establishing proper measures in those zones. Recognizing the limited time of the PRA participants, the list could not be considered complete, but it gave a good impression of the local knowledge about specific natural environments.

5.2.1 Northern Samar

Three of the four forest-edge communities in the province have divided their local ecologies into five major zones (old growth forest, secondary forest/swidden area, settlement/river, brush land/grassland, and farmland), while the other community (Barangay McArthur) drew up six zones. In the former case, secondary forests and swidden areas were lumped into one ecological zone, since most of their swidden crops (abaca, banana, coconut, and rootcrops) could be grown without the need for large clearings. In fact, all the four transect diagrams drawn by PRA participants showed only one community (Barangay San Miguel) where rice was planted in swidden farm. However, the prevalence of perennial crops such as abaca, banana and coconut could have both positive and negative effects on the secondary forest. Based on the agronomic characteristics of these crops, these would not require frequent movements from one site to another, and thus minimize forest clearings. Potential adverse consequences could emerge from area expansion for higher production of these crops, especially coconut and abaca, which served as main sources of cash incomes for the swidden farmers. Another combination of two other ecological zones such as settlement and river system - commonly represented by the term "settlement" - observed in the former case, was more reflective of the conventional criteria for the location of human settlements, as described above.

In the latter case, the presentation of Barangay McArthur settlement and river system as two distinct ecological zones in transect diagram was confusing. The resource and social map of this barangay showed the existence of three creeks that pass across the area, but no river was reflected on it. Based on experience, local residents would have greater ease in describing their institutions and resources on a map than in a transect diagram. As such, the river plotted on the transect diagram would really mean one or all of the three creeks drawn on the map. A point of interest would be to discover the main reason for the separation of the river or creeks from settlement, as this may highlight the relative importance of that body of water to the development of this community and thus the necessary interventions to sustain its vital function.

A total of 71 plants and 32 animals have been known to exist in old-growth forests of the four forest-edge communities by local residents during the transect diagramming session. Of the plant species identified using local names, those easily recognizable were:

- seven *Dipterocarp* species (almon, apitong, bagtikan, red lauan, white lauan, mayapis and tanguile);
- other commercially important forest tree species such as narra, almaciga, dao, and kamagong;
- vines such as nito, palasan and uway;
- palms such as anahaw; and
- bamboos such as kawayan.

Ferns, orchids and even fruit trees were also included in the list of plant species found in the old-growth forest. Of the animal species, the most commonly identified were wild pigs, wild chicken, wild ducks, birds, monkeys and rats. The first three animals were popular for their food values, while the last three for being pests to farm crops. Birds were also caught for food, as commodities for sale to illegal traders, and as pets. The community distribution of these plants and animals found in old-growth forest is shown in **Table 30**.

In the secondary forest cum swidden area, PRA participants from all the four communities identified some 96 plant species and 42 animal species. The relatively high number of plant species in this zone as compared to the old-growth forest could be explained by two reasons. The first reason was the inclusion in the plant species of the crops grown in the secondary forest through swidden farming. The second explanation was the familiarity of local residents to the resources of secondary forest due to the regular visits made to their swidden farms that exposed them to those resources. This was also the possible explanation for the relatively higher number of animals identified in secondary forest than old-growth forest.

Table 30
Community Resources According to Ecological Zone - Northern Samar
(PRA 2000)

PRA Site	Old Growth Forest	Secondary Forest/ Swidden Farming	Settlement/River	Brush land/ Grassland	Permanent Farmland
Las Navas					
Catoto-ogan	Plants > 35 Animals 15	Plants 29 Animals 13	Plants 24 Animals 13 -river (8)	Plants 10 Animals 5	Plants 21 Animals 1
McArthur	Plants > 30 Animals 18	Plants > 38 Animals 27	Plants 29 -river (4) Animals 21 -river (17)	Plants 14 Animals 16	Plants 31 Animals 3
San Miguel	Plants > 16 Animals > 3	Plants > 20 Animals > 2	Plants 11 Animals 5	Plants 3 Animals 4	Plants 17 Animals 6
Taylor	Plants > 51 Animals 22	Plants > 45 Animals 26	Plants 15 -river (4) Animals 20 -river (16)	Plants 30 Animals 9	Plants 42 Animals 5

Note: The 'greater than' sign (>) connotes that the actual number of resources was more than what was indicated in the cells. The figures inside the parenthesis (n) show the number of plant and animal species found in rivers.

For both the old growth and secondary forests, **Table 30** above showed that Barangay Taylor has the highest number of plant species, and generally of animal species as well. These figures tended to correspond with the considerably larger size of the total land area and, also, forest land of this barangay than the other three barangays in the province (see **Part 4**). Barangay McArthur came next to Barangay Taylor, and closely followed by Barangay Catoto-ogan, in terms of the abundance of plant and animal species identified by PRA participants. Barangay San Miguel has the least number of plant and animal species recorded despite having the second largest forest land area.

In the settlement area, the identified plant species referred mainly to vegetables, fruit trees, ornamental plants and coconut, with three common forest trees (acacia, gmelina, talisay), grown in backyard gardens and surrounding areas. Barangays McArthur and Catoto-ogan have larger number of plant species, while Barangay San Miguel has the least. Six of the plant species identified in Barangays McArthur and Taylor have been found in rivers such as gaway-gaway, lomot, pako, takbak, tanabag and water lily. The fruit trees comprised the largest number of plant species reported by local residents during the transect diagramming session, indicating less intensive land use in settlement areas at present. In terms of animal distribution, Barangay McArthur has the biggest number of animal species identified by

local residents, closely followed by Barangay Taylor and then by Barangay Catoto-ogan and Barangay San Miguel. Most of the animals raised were for food (pigs, goats, chicken, ducks), farm work (carabao), and household pets (dogs and cats). Except for Barangay San Miguel, all the three other communities have identified animal species found in rivers such as fish, shells and shrimps. The largest number of wetland species was recorded in Barangay McArthur (17) and Taylor (16), indicating the significance of rivers/creeks for local food requirements.

In Northern Samar, the brush land zone has relatively good vegetative cover. Some forest trees, bamboo, shrubs, palms and rootcrops, along with grasses (dominated by cogon) have grown in brush land areas, many of which could be found in Barangay Taylor, followed by Barangays McArthur and Catoto-ogan. Only Barangay San Miguel has recorded the lowest number of plant species, covered largely by grasses. All these communities have used this zone for carabao grazing.

In the permanent farmland areas, the identified plant species were composed mainly of rice, corn, rootcrops, pineapples, and fruit trees, including abaca and medicinal plants. The largest number of plant species was recorded in Barangay Taylor (42) which coincided with having the largest agricultural land among the four communities under consideration, followed by Barangays McArthur (31) and Catoto-ogan (21). Surprisingly, the least recorded number of plant species in Barangay San Miguel did not explain well its having the second largest area for agriculture, and also the highest agricultural land utilization rate of 57% at present. With this information, it can be postulated that the farmland areas in Barangay San Miguel have been predominantly planted to rice, coconut and abaca as depicted in its resource map, but further site validation would be needed.

5.2.2 Western Samar

The transect diagrams of community resources in the six Western Samar barangays reflected more dispersed permanent farmlands and brush lands than their counterparts in Northern Samar and Eastern Samar. Many farmlands have been developed in three different locations: between secondary forests as in Barangay Sta. Cruz (Matuguinao), between settlement and swidden area as in Barangay Tenani (Paranas) and Barangay 2 (San Jose de Buan), and/or between settlement and river as in Barangays San Isidro and Tenani (Paranas). This kind of land utilization implies that agricultural expansion has become very extensive in these local communities. Such expansion could have arisen from the following factors: an increasing demand to support a growing population, low land productivity due to the presence of coal and manganese, and high unemployment/underemployment due to labor displacement from the suspension of commercial logging operations and stoppage of mining activities. It has also become evident that farmlands have gradually transformed the former swidden farms into more permanent agricultural production areas. Brush lands have also occurred in former mining areas (Barangay San Isidro, Paranas), and often near swidden areas (in almost all the six barangays) that could have been old swidden farms under fallow condition.

As a result of the dispersed locations of community farming activities, the local residents have come up with several ecological zones, ranging from 7 (Barangay Tenani, Paranas) to 13 types (Barangay 2, San Jose de Buan), as observed from individual transect diagrams. For simplicity purposes, however, the zonal classifications made by PRA participants were

carefully grouped into seven main zones (old-growth forest, secondary forest, swidden farm, settlement, brush/barren land, river and permanent farmland) without losing the specific local economic, social or cultural importance attached to each zone.

In the six communities, the transect diagrams showed a total of only about 20 plant species and 7 animal species found in old-growth forest. Most of the plants identified were forest trees, dominated by six *Dipterocarp* species (almon, bagtikan, red lauan, white lauan, tanguile and yakal) and other commercially important hardwood species such as narra, dao, kamagong and toog; orchids (waling-waling, tiger orchid, capa de leon); and vines (rattan). These are the most common plants collected by those engaged in timber cutting, rattan gathering and orchid collection. The animals are composed mainly of wetland species such as kasili, katsapa, laka, kagang, larusan, pisipis and urang that the local settlers fished from nearby rivers for domestic consumption. The composition of barangays covered by PRA has possibly influenced the low number of resources identified, because three (Barangays San Isidro and Santa Cruz in Matuguinao and Barangay 2 in San Jose de Buan) of them have no old-growth forests as could be gleaned from the transect diagrams.

In the secondary forest, PRA participants identified 82 forest trees, 9 rattan species, 2 orchids, abaca and anahaw located in the six communities. Interestingly, the six *Dipterocarp* species found in old-growth forest also occurred in the secondary forest, plus another one: palosapis. The rattan species included kalapi, moronan, malabagacay, nakot, parasan, elhi-an, gatas-gatasan, malabagacay and uway babayi. Two different species of orchids were also identified such as maman-aw and maka-apag, located in Barangay San Isidro, Matuguinao. A total of 26 animal species were recorded in the transect diagrams, comprising birds, mammals, two reptiles and one amphibian (turtles). Among the animals, wild pigs and wild chicken are the most popular to local residents for their meat value, as well as for damages inflicted on field crops. Thus, farmers have incentives to trap these animals and little interest to conserve them. Further discussion on people's perceptions of the importance of some wildlife species is tackled in the next section.

At the community level, the distribution of plant and animal species by ecological zone is summed up in **Table 31**.

As highlighted in **Table 31**, three ecological zones (old-growth forest, swidden farm and brush/barren land) did not appear in the transect diagrams of some communities. A study of the diagrams, and the results of other PRA tools, indicate that the local people viewed most of their existing farms, both at the higher and lower elevation areas, as permanent farmlands with the introduction of coconut, banana and abaca. In some communities, even the brush lands have been cultivated to grow these perennial crops as well as other fruit trees, rootcrops and forest trees, an indicator of land use intensification. The efforts exerted by both the PRA facilitators and participants to classify the different plant (and, to a certain extent, animal) species found in each zone have allowed the presentation of the resources by major type (e.g., plants: forest trees, fruit trees, vines, palms, orchids, etc.) or source (e.g., river).

Table 31
Community Resources According to Ecological Zone – Western Samar
(PRA 2000)

PRA Site	Old Growth Forest	Secondary Forest	Swidden Farm	Settlement	Brush/Barren Land	River	Farmland
<i>Matuguinao</i>							
San Isidro		Plants 22 trees 12 vines 7 orchids 2 palm 1	Plants 12 Animals	Plants 20 fruits 16 palm 2 bamboo 1 tree 1	Plants 17 Animals	Plants 15 Animals	Plants 4 Animals
Santa Cruz		Animals Plants 46 trees 37 vines 5 palm 1 bamboo 1 others 2 Animals 21 River (5)		Animals Plants 12 fruits 11 palm 1 Animals		Plants 8 Animals	Plants 10 Animals 5 River (5)
<i>Paranas</i>							
San Isidro	Plants 10 trees 6 vines 1 orchids 3 Animals	Plants 17 trees 16 vines 1 orchids n.s. Animals 1	Plants 7 Animals	Plants 3 Animals	Plants 3 Animals	Plants 13 Animals	Plants 11 fruits 5 trees 1 palm 2 tubers 3 Animals
Tenani	Plants 10 trees 6 orchids 3 vines 1 Animals	Plants 14 trees 9 vines 5 Animals 11 birds 3 others 8	Plants 13 Animals	Plants 14 fruits 9 trees 3 palm 1 garden n.s. others 1 Animals 3		Plants 20 Animals 11 fishes 9 shells	Plants 21 garden 2 fruits 3 tubers 7 trees 4 palm 2 others 3 Animals

PRA Site	Old Growth Forest	Secondary Forest	Swidden Farm	Settlement	Brush/Barren Land	River	Farmland
<i>San Jose de Buan</i>							
Brgy 2	Plants >17 trees 15 vines 1 orchids >1 Animals 7 River (7)	Plants 19 trees 16 vines 2 palm 1 Animals		Plants Animals	8	Plants 16 trees 7 fruits 1 grasses 1 palm 1 others 6 Animals	Plants 3 Animals 7
Brgy 4		Plants 21 trees 16 vines 2 orchids 2 palm 1 Animals >5	Plants 16 rice 3 corn fruits 2 tubers 2 trees n.s. vines 1 others >8 Animals >1 birds >1	Plants garden fruits Animals	6 16 5	Plants 25 Animals River	Plants 6 Animals >14 River (14)

Note: The 'greater than' sign (>) connotes that the actual number of resources was more than what was indicated in the cells. The figures inside the parenthesis (n) show the number of plant and animal species found in rivers, n.s. means numbers are not specified.

Of the three barangays with old-growth forest, Barangay 2 in San Jose de Buan has recorded the largest number of plant species with 17, followed by the two barangays (San Isidro and Tenani) in Paranas with 10 species each. Although these numbers were low, majority of the plants consisted of commercially important forest and non-forest products such as those cited above. Interestingly, the results of PRA from Barangay 2 did not indicate that the local people have been engaged in timber cutting, as this barangay (and the entire San Jose de Buan for that matter) serves as the main abaca producing area in Western Samar. The major community activities in this zone included gathering of rattan, palms and firewood. A more significant revelation was the fact that timber cutting has assumed the most important source of income for some residents of Barangays San Isidro and Tenani (Paranas). As regards the seven wetland species noted earlier, all these were reported to exist in Blanca Aurora River in Barangay 2.

The largest concentration of plant species in the secondary forest has been recorded in Barangay Santa Cruz in Matuguinao with 37 forest trees, 5 vines, and one each of palm and bamboo. This barangay also has the largest number of animal species among the six PRA sites in the province. As a whole, the barangays of Matuguinao and San Jose de Buan still have considerable plant species, together with Barangay San Isidro in Paranas. The serious threats to these resources have been associated with some major community activities such as timber cutting, rattan gathering, firewood collection, orchid and other ornamental plants collection, and agricultural expansion (both swidden farms and permanent farms). Except for the last activity, all these involved the selling of harvest products to local and outside markets. The existence of external buyers from the town proper and urban centers such as Tacloban City, Cebu City and Metro Manila, has encouraged some local residents to engage in these activities to sustain their livelihood, in spite of the knowledge about the logging ban moratorium and the government permitting requirements.

In the swidden areas, food crops such as rice, corn, rootcrops, and banana, and cash crops such as abaca and coconut have dominated the plant species. Except for birds, no other animals have been reflected in the transect diagrams. Considering the distinctive location of both Matuguinao and San Jose de Buan (i.e., inside SIFR area), rattan has also been found in the swidden areas of Barangay San Isidro and Barangay 2. Although the PRA results have identified soil erosion as the main problem in this zone, the progressive conversion of these areas into permanent farms seem to be the serious potential threat as perennial crops covered most of the agricultural expansion areas. Intensification of perennial crop growing promotes gradual elimination of intercropping or multicropping methods to give way to more monoculture type of agriculture. Such farming system would threaten biodiversity conservation. Moreover, opening of new swidden areas in the more forested areas would then be required to grow subsistence food crops. Presently, some communities (e.g., Barangay 2 in San Jose de Buan) have engaged in agricultural expansion activities by using the brush/barren lands, including former mining areas, though low land productivity, soil pollution and soil erosion have cropped up as some major problems associated with crop production in these lands.

In the settlement areas, fruit trees comprised most plant species identified by PRA participants. The three most common forest tree species grown in this zone include gmelina, acacia and narra. Abaca has also been found to be cultivated or naturally growing in the settlement areas of most of the six communities. The particular interest in growing fruit trees in these communities has likely increased local supply of fruits, thereby

improving nutrient intake of residents. However, birds, monkeys and even wild pigs have become attracted to these trees to eat fruits, as forest food sources for these animals have become scarce. Thus, local residents, particularly the farmers, considered these animals as major pests to their staple, tuber and fruit crops. The loss of natural habitats of these animals due to timber cutting and other extractive activities is expected to increase the occurrence of such attacks on farm crops, including the fruit-bearing trees in the future.

Permanent farmlands have almost similar plant crops cultivated in swidden areas, except for fruit trees, which have not been introduced in the higher elevation part of the communities. The proximity of rice and corn fields with fruit trees has affirmed the earlier relationship implied between the fruit-bearing seasons of most fruit trees (banana, pineapple, mango, etc.) and the increasing visits (or infestations) of birds, monkeys and wild pigs on fruit trees and, consequently, rice and corn crops. Animals recorded in the farmlands have basically thrived in nearby rivers. In fact, all six communities have indicated the importance of their rivers for wetland products, particularly in Barangays Tenani (Paranas), San Isidro (Matuguinao) and San Isidro (Paranas) which identified 20, 15 and 13 edible species of animals found in rivers (fish, shells, shrimps and crabs), respectively. As stressed by PRA participants, the most serious threats to these resources are riverbank erosion, fish poisoning (using Thiodan), and water pollution caused by poisonous substances and domestic waste materials discharged to the river.

5.2.3 Eastern Samar

Like their Western Samar counterparts, the eight local communities in Eastern Samar have more categories of ecological zones, ranging from six to eleven locally differentiated types. Similarly, the swidden areas and permanent farmlands were dispersed and the area coverage of these zones has extended to secondary forest and brush/barren land, respectively, in most of the local communities. The similarities of many plant species found in old-growth and secondary forests made it difficult to differentiate the two zones. Thus, while recognizing the wisdom of the communities' classification of ecological zones, it is important to remember the arbitrariness of the distinction between these two zones, and also between secondary forest and swidden areas. Indeed, the consolidated PRA report for Eastern Samar indicated that the forest lands, which covered 75-95% of the total land area of the eight communities, were mostly considered as secondary forest. However, the information presented in **Table 32**, derived from individual community transect diagrams, showed the general perceptions of local residents about the existence of old-growth forest.

Based on the transect diagrams, the number of resources found in old-growth and secondary forests of the eight communities covered by PRA were:

<u>Old-growth forest:</u>	121 plant species and 7 animal species
<u>Secondary forest:</u>	105 plant species and 1 animal species

The transect diagrams of community resources by ecological zone are summarized in **Table 32**.

Majority of the 121 plant species identified in old-growth forest consisted of forest trees, palms, bamboo, orchid and other ornamental plants, and vines. Of the forest trees, only four *Dipterocarp* species (apitong, red lauan, white lauan and yakal) have remained

abundant in the communities. [The rest resembled those trees commonly growing in typical secondary tropical forests]. About half of these plants were recorded in the old-growth forest of Barangay Barobo in Llorente. Other communities that showed relative abundance of the plant species were the two other Llorente barangays and Barangay Pandol in Can-Avid. The extensive area coverage of swidden areas has been clearly reflected in **Table 32**, which produced patches and strips of farm crops within the secondary forests. Thus, a considerable number of swidden crops such as fruit trees (jackfruit, guyabano, lanzones, papaya, banana and coconut), rootcrops (cassava, sweet potato, yam, gabi, etc.) and vegetables (e.g., eggplant) have been included in the list of plant species recorded for secondary forest cum swidden farm. The dominance of coconut has been evident not only in swidden farms, but also in permanent farmlands. This crop is the main source of income for local farmers. Other farm crops have not been grown in large quantities in excess of domestic requirements for lack of market and poor transport system. Like in Western Samar barangays, different types of fruit trees have been increasingly grown in settlement areas and permanent farmlands in most of the local communities.

A small number of animals have been recorded by PRA participants in almost all ecological zones, perhaps with the exception of those found in rivers. Again, the relatively large number of wetland species found in rivers adjacent to the communities proved its significance as source of fish, shells, shrimps and crabs for local residents, more particularly in Barangay Concepcion (Arteche).

As **Table 32** suggests, the actual area of forest land in almost all of the barangays covered by PRA would have been smaller by now than the 75-95% of the total land area cited above due to extensive farming activities in the secondary forest. A new land use and classification survey would be needed to guide the planning for improved resource use and management in these communities.

5.3 Current Uses of Resources: Exploring Trends, Problems and Potentials

In **Part 3**, the different community activities that are dependent on forest resources have been enumerated by ecological zone. This section identifies some products produced from these activities in the 18 barangays covered by PRA, to explore the current trends, problems and potentials of specific resource uses. In this way, indications could be established on whether the commercial and subsistence uses of resources as perceived by the local communities would be compatible or in conflict with the establishment of SIFR as a protected area. The most common product/s derived from each activity were selected, as shown in **Figure 3**.

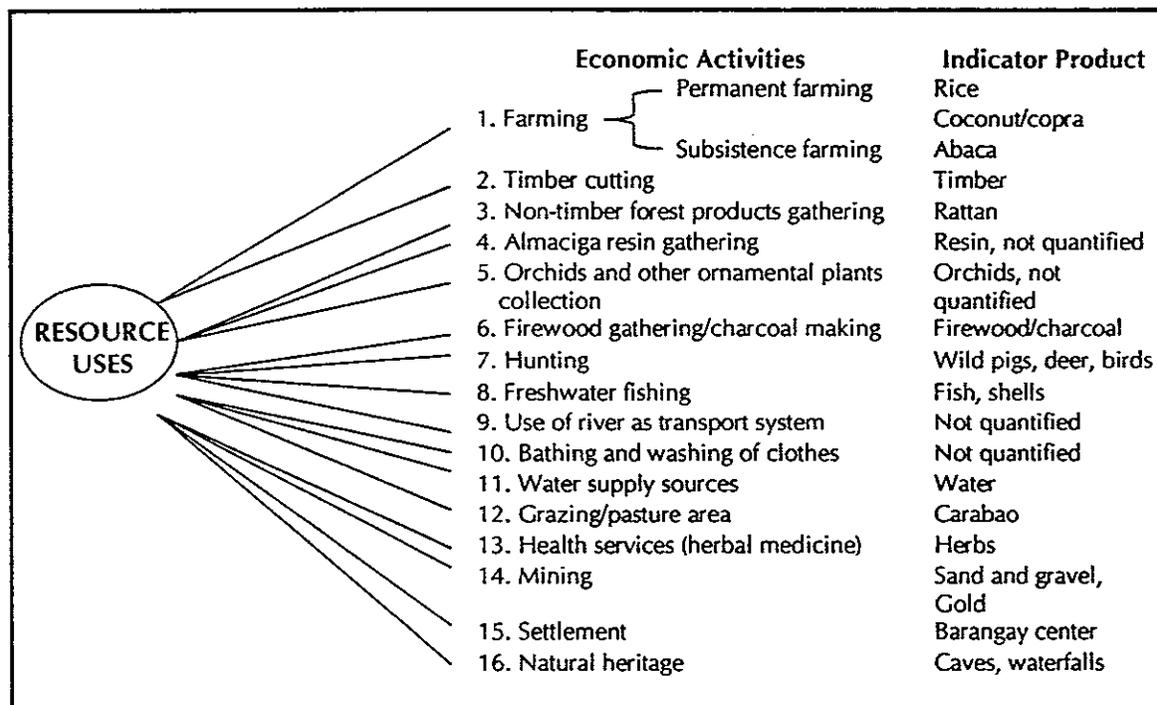
Seasonal and Temporal Trends: The basic information on seasonal and temporal trends have been obtained from the results of seasonal calendar and time trend workshop sessions, with the transect diagrams used as a main reference for situating the ecological base of specific community activities.

Table 32
Community Resources According to Ecological Zone – Eastern Samar
(PRA 2000)

PRA Site	Old Growth Forest	Secondary Forest	Swidden Farm	Settlement	Brush/Barren Land	River	Farmland
<i>Arteche</i>							
Concep-cion	Plants Animals	16 Plants Animals	85 Plants Animals	14 Plants Animals	4 Plants Animals	26 Plants Animals	20 Plants Animals
<i>Can-Avid</i>							
Balagon	Plants Animals	23 Plants Animals	7 Plants Animals	10 Plants Animals	11 Plants Animals	11 Plants Animals	> 10 Plants Animals
Boco	Plants Animals	17 Plants Animals	16 Plants Animals	16 Plants Animals	11 Plants Animals	9 Plants Animals	7 Plants Animals
Pandol	Plants Animals	> 36 4	Plants Animals	31 Plants Animals	29 Plants Animals	9 Plants Animals	9 Plants Animals
<i>Llorente</i>							
Barobo	Plants Animals	63 1	Plants Animals	> 60 1	15 Plants Animals	4 Plants Animals	19 Plants Animals
Borak	Plants Animals	41 1	Plants Animals	20 Plants Animals	34 Plants Animals	> 6 Plants Animals	9 Plants Animals
Candoros	Plants Animals	> 31 > 3			Plants Animals	> 16 3	Plants Animals
<i>Taft</i>							
Del Remedios		Plants Animals	24 Plants Animals	11 Plants Animals			22 Plants Animals

Note: The 'greater than' sign (>) connotes that the actual number of resources was more than what was indicated in the cells

Figure 3
Indicator Products of Economic Activities



Farming. As far as the major crops grown in permanent and swidden farming, rice, coconut and abaca have assumed important places: rice as the main staple crop, and coconut and abaca as the main cash crops. In some Eastern Samar barangays, however, abaca has been produced but not harvested due to poor transport system and little knowledge about the market for this product. Severe climatic conditions (extended drought or extended heavy rains) would drive farmers to grow rice in swidden areas and also concentrate on copra production to support their daily requirements. For other crops such as corn, however, farmers in general would be easily discouraged to raise them to avoid crop failure, and would normally postpone the planting until the next cropping season.

Table 33 below shows the number of croppings per year for these three crops, the pattern of production over time, area coverage and output volume, as would be permitted by the available data.

Table 33
Average Yields of Three Major Crops in the Three Provinces of Samar Island

Product	Northern Samar	Western Samar	Eastern Samar
Rice			
- average area farmed (ha/yr)	70 / swidden area 260 / farmland	0.25-1.5/hh/swidden 1.0/hh/farmland	0.2-0.6/hh/swidden * 0.5-0.8/hh/farmland *
- average yield (kg/ha) * *	30-380	330-1,470	840-2,500

Product	Northern Samar	Western Samar	Eastern Samar
- number of croppings per year	twice a year in two areas, once in other areas	twice a year	twice a year in most areas, once in some
Coconut/copra equivalent			
- average yield	170 kg/ha	1-20 sacks/cropping/hh	60-150 kg/ha
Abaca			
- average yield	150 kg/ha 7,200 kg/hh/yr	10-60 kg/hh/wk 480-2,890 kg/hh/yr 14,400-455,000 kg/yr	50-1,000 kg/ha

Note: (*) Barangay Del Remedios, Taft. (**) 1 sack = 42 kg. Figures rounded up.

As may be noted from **Table 33**, the use of local units of measure for farmed area and crop yield has expectedly resulted in different sets of information. As a whole, local farmers in Western Samar communities have utilized relatively larger swidden farms than those living in Northern and Eastern Samar communities at an average of 0.25 to 1.5 hectares per household. In both Northern and Eastern Samar communities, the average size of swidden farms ranged from 0.2 to 0.6 hectare per household. However, the size of swidden farms has been steadily increasing in Eastern Samar communities over the past ten years, while that of Northern and Western Samar barangays did not show significant changes. With the limited available information, it could be argued that the subsistence use of resources for swidden farming in Northern Samar communities at the current level would not conflict with the establishment of SIFR, since the residents have only utilized about 10% of the total forest land for this purpose. Similarly, the four communities still have ample space in agricultural land to expand their farming activities, given the current utilization rate of 31%. But this situation may not be true in Western and Eastern Samar communities given the results of the transect diagrams that showed the wide spread of swidden areas, and the time trends that showed relatively large or increasing farm sizes. Furthermore, two communities in Eastern Samar (Barangay Candoros, Llorente and Barangay Concepcion, Arteche) also hinted that the swidden farm area has been larger than the permanent farmland area, as reflected in the time trends. Of course, many of the swidden areas in these communities have been subjected to commercial logging in the past that created wide openings in forest canopy and cultivable area suited to farming after its operations. In contrast, the Northern Samar communities have been spared from commercial logging.

All the available data on permanent farmland indicated an increasing trend in size of total agricultural land used for crop cultivation in Northern and Eastern Samar communities for the past ten years. Because of the generally even distribution of rainfall throughout Samar Island, lowland and swidden farming could be done twice a year, except in some areas in Northern Samar that also experienced the Type II climatic condition.² Cultivated farmland has an average size of 1.0 hectare in Western Samar communities, compared to 0.5-0.8 hectare of their counterparts in Northern and Eastern Samar.

In **Table 33**, the average yield of rice applied to permanent farmland and swidden area, although there has been a generally lower yield in the former than in the latter as could be

² Type II climatic type is characterized by distinct dry season from April to September and rainy season from October to March.

observed from the time trends. Average rice yield has been recorded to be very high in Eastern Samar communities at 840-2,500 kg/ha, and lowest in Northern Samar areas at 30-380 kg/ha. Interestingly, the higher level of average rice yield in Eastern Samar (2,500 kg/ha) and Western Samar (1,470 kg/ha) has exceeded the respective provincial averages of 1,460 kg/ha and 1,170 kg/ha, respectively, recorded in 1993 (see *Part 3*). The rice yield in Northern Samar communities has not even achieved one-third of the provincial average of 1,210 kg/ha in 1993.

The average yield of coconut varied considerably among communities, ranging from 170 kg/ha (copra equivalent) in Northern Samar to 60-150 kg/ha in Eastern Samar. In Western Samar, sack was the unit used to measure coconut production rather than kilogram, placed at 1-20 sacks per cropping per household. The geographical location of Eastern Samar facing the typhoon belt area in the Bicol Region has perhaps caused damages to the branches and fruit-bearing behavior of coconut trees due to adverse impacts of the strong winds brought by frequent typhoons. Eastern Samar communities have also harvested their coconut only three times a year, in contrast to the four harvesting times in Northern and Western Samar. All the coconut yields of local communities in the three provinces, however, have not performed well as compared to the provincial averages in Samar Island. An indication of the land use pattern for coconut production could be gleaned from two specific situations portrayed in *Table 34* below.

Table 34
Patterns of Land Use for Coconut Production

Barangay	Land Use Pattern for Coconut Production
Barangay Santa Cruz, Matuguinao	Coconut production increased due to increases in area and increases in price of copra in recent years, resulting in area expansion from 3 to 5 hectares per household from 1990 to 1999.
Barangay San Isidro, Paranas	Copra was the only source of crop production during El Niño in 1998 when rice production was almost wiped out. Each household has an average of 1.0 hectare farm: 0.5 hectare to coconut; 0.25 hectare to rice and 0.25 hectare to other crops.

Abaca production has recorded a high average yield of 7,200 kg per household per year in Northern Samar, and about 3,000 kg in Western Samar. For the local communities in these two provinces, abaca ranked second to coconut (copra) as important sources of their agricultural income. Barangay 2 in San Jose de Buan has established itself as one of the abaca producing areas in Western Samar. To get a good appreciation of the importance of abaca to the local communities, the number of households engaged in abaca production was asked from PRA participants, as shown in *Table 35*. Assuming that half of these current yields have come from one hectare of land, the resulting numbers would still be higher than respective provincial averages registered in 1993 (see *Part 3*). This crop has shown high potentials for improving the economic base of the community, and also for conserving the natural resource base of SIFR.

Table 35
Production and Farm Households in Abaca Growing, 1999

Barangay	Production Data
Barangay 2, San Jose de Buan	Abaca production was 30 kg/week per household with 109 households (100% of the total barangay households) involved. Production here started only in 1998.
Barangay 4, San Jose de Buan	Abaca production was 60 kg/week per household with 158 households (100%) involved.
Barangay Tenani, Paranas	Production data was 10 kg/week per household with 30 households (13%) solely involved in abaca and rattan gathering. This production declined from 100 kg/week per household in 1990. Fifty percent of their income came from the sale of abaca and rattan.
Barangay Santa Cruz, Matuguinao	Production has been steady at 40 kg/week per household from 1990 to 1998, but decreased to 25 kg/week in 1999. Twenty-six households (100%) were involved in this activity. Farmers have started to plant abaca in their farms to avoid collecting from distant areas.

Timber Cutting. PRA participants confirmed the occurrence of timber cutting in their communities, but they argued that most of the harvests have been used for house construction and improvement, or furniture making. Based on the time trends, it appears that a significant amount of timber has also been sold in the market, as reflected in **Table 36** below showing the rate of timber extraction in two Western Samar and three Eastern Samar communities in 1999.

Table 36
Rate of Timber Extraction in Western and Eastern Samar

	Western Samar	Eastern Samar
Timber extraction (bd. ft.)		
• bd.ft./hh/week	400	130-3,580(*)
• bd.ft./hh/year	19,200	(lauan): 6,000-150,000(*) (yakal/narra): 100-22,000(*)
• total / year	1,785,600	6,100-172,000(*)
Household income (pesos/hh/mo.)	16,000	(lauan): 2,296,000(*) (yakal/narra): 572,000(*)

Note: (*) Total production/income of three communities (Bgy. Barobo, Bgy. Concepcion and Bgy. Del Remedios. Raw data extracted from time trends and livelihood analysis tables.

Excluded from the usual estimation of PRA participants was the quantity of timber extracted and used solely for domestic consumption. Despite the scarcity of data on this activity, the above figures implied that the number of trees removed from the forests of five communities cited could be no less than 100 trees per year. In Barangay San Isidro, Paranas, for instance, PRA participants estimated that some 32 trees were cut per year in their community, with only 8 households involved in this activity. In a nearby barangay (Barangay Tenani, Paranas), 93 households (or 41% of the total barangay households) have been reported to be solely dependent on timber cutting for their livelihood. Some of these households used portable chain saws to harvest timber. The accessibility of these communities has encouraged outside buyers to make frequent contacts with local timber cutters and entice them to pursue a living out of this conservation-incompatible activity

with the promise of a good price and a steady market for timber. In Eastern Samar, there has been an increasing trend of timber extraction in at least two communities (i.e., Barangay Del Remedios, Taft and Barangay Barobo, Can-Avid). Timber cutting has been a year round activity, with peak seasons in April and May to augment cash requirements for fiesta and school enrollment, in July and August to respond to the large demand for lumber from Catbalogan, and in November to January to meet the high demand for lumber from other places and domestic needs for extra income for the Christmas and New Year celebrations.

Non-Timber Forest Products Gathering. Among the non-timber forest products, rattan served as one of the primary sources of cash income for many local residents, along with wild abaca. Here, abaca has been considered under farming activities due to the decision of some farmers to grow this crop in swidden areas or in the vicinity of their farmlands. Rattan gathering has been practiced in practically all of the 18 communities due to abundance of different rattan (vine) species, as witnessed from the transect diagrams of community resources. As shown in **Table 37**, more than 600,000 rattan poles were collected in 11 communities in the three provinces in 1999 alone, involving no less than 520 households. In most areas, this activity is done all year round, peaking during the dry season (March-August) and also from January to June while waiting for rice to grow and mature. In Eastern Samar, however, some PRA participants noted the destructive practice of some gatherers by cutting the host trees of rattan for convenience. The extent of this practice has not been recorded, however.

Table 37
Rattan Collection in Samar Island, 1999

	Northern Samar	Western Samar	Eastern Samar
Rattan gathering (number of poles)			
• poles/hh/week	16	30	
• poles/hh/year	756	1,440	
• total / year	183,792	365,760	(***) 500-5,000
Households directly engaged (no.)	(*) 275	(**) 254	

Note: (*) Total of households from four communities. (**) Total of households from three communities. (***) Range of total annual production from the four communities. Raw data extracted from time trends and livelihood analysis tables.

In all communities, the source of rattan has gone farther from the settlements, also resulting in the decline of poles collected by gatherers. These particular circumstances were clearly experienced by rattan gatherers in three communities in Western Samar as illustrated in **Table 38**. The distance to collect remaining rattan has at least doubled from 2-8 km to 6-16 km in many communities over the last ten years (1990-1999), implying the further incursion of this activity towards the outer fringes of the old-growth forests. In the barangays of San Jose de Buan, the collection of young rattan for food has been raised by PRA participants as a problem to the future harvest of this important product.

Table 38
Patterns of Rattan Gathering

Barangay	Distance Traveled by Gatherers
Barangay 2, San Jose de Buan	Distance to collect rattan has doubled or even tripled from 2.6 km in 1990 to 6-10 km in 1999.
Barangay 4, San Jose de Buan	The distance doubled from 8 km to 16 km from 1990 to 1992.
Barangay Tenani, Paranas	The distance increased from 7 km in 1990 to 10 km in 1997. During this period, production declined from 60 to 30 poles/week/hh. PRA participants argued that the decrease in production was not entirely due to the distance problem but also to the intrusion of some gatherers from nearby barangays who came to the barangay to collect rattan.

Firewood Gathering/Charcoal Making. Although many of the seasonal calendars and time trends have indicated the occurrence of this activity, the limited data on fuelwood gathering and charcoal making originated mainly from Barangay Tenani in Paranas. In 1999 the average production of firewood and charcoal was estimated at 10 bundles (consisting of 100 pieces of chopped wood per bundle) and 60 sacks per household per week, respectively. According to PRA participants, the trees normally gathered for these products were lesser-known species (though no examples have been cited). In this barangay, the peak months for firewood gathering occurred during dry season from June to August, and then in December due to high demand for fuelwood to be used for cooking food during Christmas and New Year. Firewood gathering has also moved away from the settlement from half a kilometer in 1997 to one kilometer in 1999. Prior to 1997, this activity seemed to have been done close to the settlement. Until recently, firewood gathering remained in the secondary forest of this community.

In Northern Samar, PRA participants informed the team that firewood gathering has also increased in distance. It actually more than doubled in Barangay McArthur for the past ten years, while it moved by another one kilometer in Barangay San Miguel from 1.5 km to 2.5 km during the same period.

Hunting. Perhaps hunting has provided multifarious functions than any of the community activities so far examined. PRA results showed that it served to catch birds (e.g., pikoy or blue-naped parrot and kalaw or Rufous hornbill) and mammals (e.g., wild pig and deer) for food and recreation, elimination of crop pests, and as a source of cash income. Hunting of birds was normally done during the months of April and May when crops and trees have begun to bear fruits, while that of mammals was a year-round activity. Based on seasonal calendars and time trends, an indication of the extent of hunting activities in some local communities is provided in **Table 39**.

Table 39
Extent of Hunting Activities

PRA Site	Birds				Mammals				Hunters (no.)	
	Number		Distance		Number		Distance		1990	1999
	1990	1999	1990	1999	1990	1999	1990	1999		
<i>Northern Samar</i>										
• Catoto-ogan	80	15			40	10			3	1
• McArthur	80	15			50	20			3	2
• San Miguel					60	40			15	15
<i>Western Samar</i>										
• Barangay 2					8	25				
• San Isidro, Paranas	2	6					11	22		

In Northern Samar, the number of birds and mammals caught has been decreasing for the last ten years due largely to diminishing number of these species in the wild (Barangays Catoto-ogan, McArthur and San Miguel) and the low participation of hunters (Barangays Catoto-ogan, McArthur and Taylor). In contrast, hunting has generally increased in the two communities in Western Samar, as reflected in **Table 39** above. The average number of animals trapped in Barangay 2, San Jose de Buan, has been estimated at one head of wild pig per week and two heads of deer per month from 1990 to 1999. During this period, hunters had to walk from 1.5 km to 22 km to trap these wild animals. PRA participants from this barangay have reported a 'sighting' of the Philippine Eagle in 1995 at about 10 km from the settlement. Wild pig meat was intended for home consumption, but some surplus was sold to neighbors to earn cash for other household needs. Birds have, however, been reserved for outside buyers who went to the community to pick up the birds, some of which ended up in illegal trading markets in Metro Manila. Some farmers in these communities were involved in hunting of birds and wild pigs, including monkeys and rats, to eradicate them for good crop harvest.

Freshwater Fishing. Practically all the communities have benefited from the complex nature of river systems in SIFR that provide habitat to important fish and shellfish for their food requirements. The number of fish and shellfish species caught in the rivers (see **Part 5**) has been reported as follows:

Northern Samar: from 8 (Bgy. Catoto-ogan) to 17 (Bgy. McArthur)

Western Samar: from 7 (Bgy. 2) to 20 (Bgy. Tenani)

Eastern Samar: from 9 (Bgys. Boco, Borak, Pandol) to 26 (Bgy. Concepcion)

The most common species caught in the rivers included pantat (catfish), haru-an (mudfish), pokot (freshwater shrimp), kagang (freshwater crab), laka (freshwater shell), and kasili (eel). Some saltwater species have also been caught in Barangay Concepcion (Arteche) such as tilapia, apparently brought into the freshwater systems through the interaction of the rivers with bays and other sea outlets. PRA participants also observed the existence of turtles in Barangay San Isidro, Paranas. Their distance to sea waters, meager household incomes and the poor transport systems have propelled local residents to find other sources of protein and iodine for their daily diet within their reach. The rich resources of the rivers naturally provided them with food supplements. However, three most serious problems that threaten

the ecological stability of the rivers have been raised by PRA participants: the erosion of riverbanks due to the expansion of farmlands to the edges of the rivers, the destructive fishing practices that involved the use of Thiodan to poison the fish species, and water pollution resulting from the poisoning of fish and the indiscriminate throwing of domestic wastes in the rivers. Sand and gravel extraction from major rivers (e.g., Olot River, Kigad River and Llorente River) has also been noted as a serious potential threat.

Health Services (Herbal Medicine). The communities have relied mainly on medicinal plants grown in their farms and that are available in the forest to cure common ailments. In areas with poor health services and which are quite inaccessible, reliance on herbal medicine seemed to be the most practical way of treating common diseases. Health workers visit majority of the PRA barangays only once in three months. Some sites can be reached only by taking a 4-5 hour boat ride, or long hours of walking and crossing rivers five or more times such as the communities in Matuguinao and San Jose de Buan in Western Samar, and Las Navas in Northern Samar. Some of the most common medicinal plant species include: dulaw, hasmin, lakdan, lubigon, pandan, and sunting collected from swidden areas and/or secondary forest, and kabak, kerom-kerom, kogon, laas, lakatan, and pakol from the farmlands. Residents have not identified any major problem on the present and future supply of medicinal plants in their communities.

In some of the PRA reports, residents consult doctors or health workers only if the use of medicinal plants does not work, or if the efforts of the local 'hilot' fail.

Mining. Several mineral resources (e.g., gold, copper, chromite and silver) have been cited in the PRA reports, but the main mining activity in most of the communities has concentrated on gravel and sand extraction because of the relative abundance of these materials. These materials have been used mainly for domestic purposes such as house/building improvement and basic barangay infrastructure development (e.g., barangay roads). Paranas and Llorente communities have particularly raised the pollution problem brought by this activity to their important rivers (Olot and Llorente rivers, respectively). Information on the extent of sand and gravel extraction, and the number of households engaged in this activity, among other things, however, has not been tackled during the PRA process.

In Barangay Barobo, Llorente, the community time trend showed that gold mining has been providing additional cash income for 25 households for the past ten years. This activity has followed the traditional river based gold panning operations. The production of gold has decreased from 150-200 kilograms in the early 1990s to 10 kilograms in 1999. During this period, a kilogram of gold was sold at P 220.

Settlement. For the forest dependent communities, SIFR serves as a dwelling place. It provides a basic need - a space to live and farm, and it serves as an environment where they can raise their families, their children, and descendants. PRA sites share a common history - these were inhabited by migrants in search of a new frontier in the absence of land to till in the lowland, a situation highlighted by the natural geography of Samar Island. The narrow plain with very rugged topography has made the supply of lowland farmlands very limited. Moreover, *some communities are products of continuing expansion of existing settlements* - initially developing as sitios of existing barangays, and thereafter evolving as

satellite barangays to accommodate the expanding population, and the formation of distinct interaction and functional linkages among community members.

While settlement sites occupy only a small portion of the land areas in the PRA barangays, the communities are functionally linked with the greater part of the landscape - as shown in their transect diagrams. The swidden areas, the permanent farmlands, the brush lands, river systems, as well as the secondary and old-growth forests are all part of the community's abode, and provide them the necessary benefits for sustenance, overall well being, and quality of life.

Water Supply Source. All the communities, including those serviced by jetmatic pumps using underground water, have depended on springs and creeks for potable water. Community residents in Northern Samar, for instance, have to walk 1 to 3 kilometers to fetch water from a spring source. Those in Barangay Catoto-ogan have learned to store water during rainy season for drinking water due to the distant location of the nearest spring. However, at summer time, they also walk three kilometers away from the barangay proper to obtain drinking water. The community profiles (see *Part 4*) vividly illustrate the critical role of the proper protection and management of the forest for the maintenance and sustainability of water quality from natural sources such as springs and creeks. Thus, PRA participants noted the poor water supply situation as one of the major problems in their communities. This function of the forest through maintenance of water quality in creeks, springs and rivers has often been neglected in the formulation of management approaches for forest resources or biodiversity conservation and development. Even some communities, based on the PRA reports, have failed to see the value of the functional linkages between the forest and the creeks and springs for their water supply requirements, because of economic preoccupation (timber extraction, rattan gathering, wildlife hunting, etc.).

Transport System. Apart from fishing, rivers have been used by many of the communities as a major mode of transport to reach the town centers for buying and selling basic commodities, and sending children to schools at elementary and secondary levels. Small to medium-sized boats, both motorized and non-motorized, have established regular schedules at various landing points along the rivers. Although many of the boat owners or operators reside in the town centers, some more entrepreneurial families in the communities also managed to own passenger and cargo boats (mainly for copra). As noted elsewhere in this report, local residents have posed serious concerns about the riverbank erosion, flash floods accentuated by the removal of forest vegetation, and absence of support for river rehabilitation and development.

Natural Heritage. With its present rich biogeographic characteristics, SIFR is by itself a natural heritage. In addition to its species and habitat diversity, this reserve possesses a significant number of caves such as the Kabibihan and Tingib caves in Paranas, Sohoton cave in Basey declared as a national park, and the Calbiga caves declared as a protected landscape in the 1990s. Many of these caves have been reported to contain large amounts of stalagmites and stalactites, and also harbor plant and animal species, but these have not been inventoried and assessed. Falls also abound in the reserve, exemplified by Pinipisikan falls in Barangay Candoros, Llorente and Pangpang and Nasarang falls in Paranas. These caves and falls, including Mt. Huraw in San Jose de Buan, also form part of the country's natural heritage and thus deserve proper management and development for the greater

benefit of the local communities, and the national and global stakeholders as well. For the forest dependent communities, the river systems and the resources found therein need to be incorporated in the considerations for the valuation of SIFR biodiversity and the formulation of appropriate management approaches to ensure the sustenance needs of these communities.

The PRA results from the 18 barangays in the three provinces have included anecdotes about harmful spirits residing in some large trees, mountains and falls that provide 'check' for local people to keep distance from these resources. Although most of the local residents have an appreciation of the potential uses of these resources, their knowledge of the specific economic and conservation values of the same resources remains low and limited to the understandably immediate sustenance requirements of their communities.

6. COMMUNITY BENEFITS FROM SIFR RESOURCES

As discussed in the previous chapters, SIFR provides a range of benefits to the local communities. In the context of valuation, these benefits are:

Direct Use Values: Subsistence and commercial benefits

Indirect Use Values: Prevention of soil runoff, water quality maintenance, transport systems

Non-use Values: Existence and bequest values

While this chapter does not attempt to estimate in monetary terms the values associated with these benefits, a description will be made of the nature of the benefits derived by the communities from the use of resources within SIFR. Based on the results of PRA in 18 barangays, the perspectives of the communities on the importance of SIFR resources to their subsistence, life support systems, and as a source of cash income in times of emergencies, calamities, famine and other important events, will be presented.

6.1 Direct Use Values

6.1.1 Subsistence Benefits

Food Security. More than 95% of the community members are engaged in subsistence farming. In the swidden areas, permanent farmlands and settlement sites, the major crops grown are coconut, rice and corn. Planting of vegetables and fruit trees, raising of livestock, hunting of wild animals, and fishing in the SIFR's river systems provide food supplements to support the requirements of the upland population.

The forest environment and its resources provide convenient alternative sources of food in times of poor harvests, and while waiting for the crops to grow to maturity. In other words, because of the communities' high dependence on SIFR, they have developed certain coping mechanisms to satisfy their own needs.

During the El Niño years, for example, farmers had to expand their cultivation of upland rice to compensate for the losses incurred in lowland/rainfed rice production. As production of rice decreased, farmers had to rely on coconut harvests to earn cash for other daily needs. The farmers also had to forego corn production so that they could tend to their

upland farms. The production patterns after 1998, when the El Niño phenomenon was believed to be over, showed the production of upland rice decreasing while the production of lowland rice increased to their pre-El Niño levels. Farmers could no longer maintain their expanded upland farms.

The seasonality of crop production drives the communities to find other food sources or means to earn cash. In most of the communities studied, off-farm sources of income are resorted to in order to augment their income during the dry season and while waiting for the crops to grow. In Western Samar, for example, farmers have to travel longer distances to gather rattan and abaca especially during the peak season of January to June, while waiting for the harvest time of rice. Moreover, farmers resort to timber cutting and firewood gathering to augment cash requirements for fiesta celebration, enrollment, and other important events such as Christmas and New Year.

Hunting for wildlife has remained at low levels, averaging only about one wild pig per household per year, usually undertaken during summer months when trees begin to bear fruits. In addition to providing food and cash income based on proceeds, farmers hunt wild pigs because these are considered pests, together with birds, rats and monkeys - they eat and destroy valuable crops.

The upland communities of SIFR are more fortunate than their counterparts in other areas of the country - the rivers are an important source of protein and iodine for their daily diet. The complex network of river systems in SIFR is a habitat of important fish and shellfish for these communities. In almost all the PRA sites, the rivers feature prominently as important sources of catch to support the residents' food requirements. Species caught in the rivers consist of pantat (catfish), haru-an (mudfish), pokot (freshwater shrimp), kagang (freshwater crab), laka or susu (freshwater shell), kasili (eel) and katsapa (frog), including bao or kumaw (turtle), and some saltwater species such as tilapia; apparently brought into the freshwater systems through the interaction of the rivers with bays and other sea outlets.

Habitat / Settlement. For the forest dependent communities, SIFR is simply a dwelling place. It provides a basic need - a space to live, farm, and an environment where they can raise their families, their children, and descendants. The history of PRA sites share a common element - these were inhabited by migrants in search of a new frontier in the absence of land to till in the lowland, a situation highlighted by the natural geography of Samar Island. The narrow plain with very rugged topography simply makes the supply of lowland farmland very limited. Some communities are products of continuing expansion of existing settlements - initially developing as sitios of existing barangays, and thereafter evolving as satellite barangays to accommodate the expanding population and the formation of distinct interaction and functional linkages among community members.

While settlement sites occupy only a small portion of the land areas in the PRA barangays, the communities are functionally linked with the greater part of the landscape - as shown in their transect diagrams. The swidden areas, the permanent farmlands, the brush lands, river systems, as well as the secondary and old-growth forests are all part of the community's abode, and provide them the necessary benefits for sustenance, overall well being and quality of life.

Firewood. SIFR is an important source of firewood for cooking. By the mere income level of the households in these communities, they cannot afford gas or power fired burners for cooking. Their distance from town centers, the poor accessibility, and the sheer lack of electricity makes it also impractical to buy other types of stoves. The abundant wood - twigs, branches, fallen trees, and other firewood species that are available for free for the communities - offers a practical choice for cooking.

Surprisingly, firewood gathering does not feature significantly in the resource maps and transect diagrams. This is perhaps because the activity does not yield cash or direct incomes to the farmers. Firewood resources therefore are undervalued, if these are viewed in the context of incomes spent if the resource was not free. Assuming that each household consumes an average of 2.0 cubic meters of firewood per month, the harvests of firewood in the PRA barangays would total to about 46,800 cubic meters per year (i.e., total number of households (1,949) x 2 cubic meters x 12 months).

In Barangay Tenani where there are reports of firewood gathering for commercial purposes, harvests reached as much as 10 bundles of 100 per household per week. While the farmers are engaged in firewood gathering all throughout the year, peak production months occur during the months of June, July and August because of demand from nearby municipalities celebrating fiesta. Another peak season is during the month of December, because of increased demand for Christmas and New Year celebrations.

Building Materials. Almost all the houses in the PRA sites are built with plant materials with the exception of a few and some structures in the barangay center - school, church and barangay hall. The most used species are bamboo for flooring and walls, hardwoods for posts, and nipa for roofing. These materials are all available from the secondary forests and riverbanks close to the settlements.

Medicinal Plants. The communities have relied mainly on medicinal plants grown in their farms and those available in the forest to cure common ailments. In areas with poor health services and which are quite inaccessible, reliance on herbal medicine seemed to be the most practical way of treating common diseases. Health workers visit majority of the PRA barangays only once in three months. Some sites can be reached only by taking a 4-5 hour boat ride, or long hours of walking and crossing rivers five or more times such as the four communities in Northern Samar.

In some of the PRA reports, residents consult doctors or health workers only if the use of medicinal plants does not work, or if the efforts of the local 'hilot' fail.

6.1.2 Commercial Use

In all the three provinces, harvests of forest products for commercial purposes are driven by the following considerations:

- the need to augment cash income during lean months and the increased household expenditures during enrollment, celebration of fiesta, Christmas, New Year and the like;
- the existence of a market or demand in nearby barangays, municipality or capital town; and
- the accessibility of sources to potential markets.

Timber Harvests. In both provinces of Western and Eastern Samar, PRA participants reported timber cutting as one of their economic activities in the secondary (and possibly old-growth) forests. A household engaged in timber cutting can produce as much as 19,200 board feet per year and provide an income of P 16,000 per month. In the Eastern Samar communities, production of timber reaches from 6,000 to 150,000 board feet per year of lauan, and 100-22,000 board feet per year of yakal and narra. Collectors earn from P 4,583 to P 12,500 per month. Some households are engaged full-time in timber cutting, while the rest derive a large proportion of their household income from the activity, by as much as 55%.

Because the secondary forests have given way to expanded swidden and permanent farmlots in Western Samar, production of timber has shown a declining trend over ten years. In Barangay San Isidro, Paranas, for example, harvests declined from 60 trees per year in 1990 to only 24 trees per year in 1999. In Barangay Tenani, also in Paranas, harvests decreased from 2,000 board feet per household per week in 1990 to only 400 in 1999. This sharp decline happened when the distance to harvest timber increased only from half a kilometer to 2.5 kilometers, compared to their original sources ten years earlier. This implies the diminishing supply of timber from the secondary forests. If this trend will continue, timber cutting will diminish in importance as more secondary forests are cleared and converted to swidden and permanent farms.

In Eastern Samar, there is a general trend of increasing timber harvests over the years. While harvests of yakal declined in Barangay Barobo, Llorente, this was compensated by sharp increases of red lauan production from 20,000 board feet per collector in 1990 to 150,000 board feet per collector in 1999. This situation prevailed even when the distance to harvest rose sharply by 5.0 to 6.5 kilometers from their sources 10 years ago; and the number of days required to harvest increased significantly from half day in 1990 to three days in 1999.

Timber harvests have become so lucrative as a source of income compared to farming, such that PRA participants from at least two barangays in Eastern Samar have indicated shifting to this activity from farm-based activities.

In both provinces, the three factors mentioned above favor the continued practice of timber harvesting.

Rattan Gathering. The forests of SIFR offer a rich source of a variety of rattan species. Available from secondary forests, rattan species are harvested as source of additional income, especially during lean months, and not as primary occupation. Income from rattan sales can reach P3,840 per collector per month.

Most of the holders of rattan cutting permits are residents of the lowland barangays, poblacion or capital towns. Local communities benefit through middlemen who make arrangements with collectors to supply rattan poles for pick up by permit holders at a pre-defined location, schedule and price. Farmgate price of rattan is largely dictated by these middlemen. The price increased from P 15 per 100 pieces in 1990 to P 32 in 1999. Over the years, the source of rattan gets increasingly farther from settlements while the volume of production decreases steadily.

6.2 Indirect Use Values

6.2.1 Prevention of Soil Runoff

The primary and secondary forests of SIFR has served as protection to the communities' swidden farms in terms of preventing excessive soil runoff. However, while the upland farms have remained relatively "protected", the expanded patches of forest clearings have contributed to the overall increased soil runoff. This has contributed to the overall decline in productivity of upland farms, thereby further encouraging the opening of new areas for cultivation.

6.2.2 Water Quality Maintenance

Related to the prevention of soil runoff, maintenance of water quality is another important value of SIFR to the communities. Far from the reaches of facilities for water distribution, the upland communities are almost 100 % dependent on springs and rivers for drinking water and other water related needs such as bathing, washing of clothes, etc. Over the years, the sources of good quality spring water have gone farther and farther mainly because of siltation of the headwaters. The PRA communities have also reported immediate negative effects on their existing sources of spring water during the rainy season - an indication that some serious siltation has occurred at their sources.

6.2.3 Transport System

Majority of the upland communities is dependent on the extensive network of SIFR's river systems for transport. Because of the very rugged terrain, the rivers offer a convenient way of transporting their goods and provide a good means of mobility among barangays and between the upland barangays and the poblacion or provincial centers. While the lack of effective accessibility routes by land has discouraged what could have been an increased rate of migration to the uplands, and reduced the intensity of what could have been an increased rate of utilization of resources within SIFR, this limitation also contributed to the continued neglect or lack of basic services for the communities. Indeed, the PRA reports show that the areas more accessible and which have better means of interaction with lowland barangays are the ones where the rates of timber and other forest product harvesting are high.

6.3 Non Use Values

6.3.1 Existence Values

For the upland communities, the existence of SIFR itself has a fundamental value to their subsistence. For these people, SIFR offers all that they need to enjoy a decent life. Unlike other stakeholders detached from the resource, the fact that SIFR exists provides not only a sense of improved well being or quality of life, but also offers the basic necessities for their continued existence. The communities continue to survive because the SIFR exists. Theirs is a more fundamental relationship between the existence of the communities and the existence of the resource.

6.3.2 *Bequest Values*

For lack of any other possession, the claims of upland communities over portions of SIFR constitute their much valued property which they have and will pass on to their next generations. The history of the PRA sites tell us that indeed, such properties have been passed on from one generation to the next, some dating as early as the period during the Spanish occupation until the present time.

The kind of bequest value attached by the upland communities to the SIFR may be much different from that attached by other stakeholders remote from the resource. For the former, the bequest is an inheritance for survival, while for the latter, the value would be in the form of ensuring that the next generations continue to enjoy the off-site benefits that the resource provides, or the value of the natural heritage which SIFR represents.

7. COMMUNITY OPTIONS AND PREFERENCES FOR SIFR USE AND MANAGEMENT

7.1 *Community Options and Preferences*

A culminating activity of the PRA activity is a workshop among the participants on their options and preferences for SIFR use and management. This is a fitting finale after the community members have analyzed for themselves the major uses of and benefits from SIFR, their seasonal calendar and how such factors as important events, other occasions in the lowland barangays to which they interact, prices and supply of products affect their pattern of resource use. The analysis of options and preferences also follow the review of income sources and livelihood patterns of the communities. The results of the ranking of the preferred option for SIFR use and management, from the perspective of the communities is summarized in *Table 40*.

Table 40
Ranking of Preferences for SIFR Use and Management

Rank	Northern Samar	Score	Western Samar	Score	Eastern Samar	Score
1	Kaingin Farming	33 [4]	Permanent Farming	19 [4]	Permanent Farming Kaingin Farming	27 [8] 27 [4]
2	Forest Conservation	29 [4]	Barangay Development	17 [4]	Barangay Development	26 [8]
3	Barangay Development	22 [4]	Forest Conservation	13 [5]	Forest Conservation	24 [7]
4	NTFPs Gathering	17 [4]	NTFPs Gathering	11 [5]	Fishing	23 [8]

Rank	Northern Samar	Score	Western Samar	Score	Eastern Samar	Score
5	Logging	16 [4]	Logging	9 [5]	Logging	20 [5]
6			Hunting	4 [1]	NTFPs Gathering	20 [4]
7					Mining/Quarrying	18 [4]
8					Wildlife Protection	17 [2]

Note: The number in bracket [] sign reflects the number of communities that ranked the option.

As shown, there is a general pattern of preferences among all the 18 barangays covered by the PRA. The use of SIFR for kaingin and/or permanent farming figure prominently as number one among the priorities given by the participants among all the possible uses of the resource. The result is quite understandable, given the fact that all the communities covered by the study, and all the upland communities in the SIFR for that matter, are all migrants who moved to the uplands to find a convenient place to farm and dwell. Unlike other indigenous communities in other parts of the Philippines who, for generations, have passed on to their descendants the much valued customs and traditions which are compatible with sustainable use, most of the SIFR's communities have brought with them the lowland practices of clearing and pattern of kaingin with fallow period, which are not necessarily compatible with resource conservation. As demand grows with increases in population, such fallow period has shortened over the years which has led to further reduction of the secondary forests in favor of expansion of kaingin areas.

The communities ranked second barangay development as a preferred option to respond to the long neglect for this service by the government in such far flung areas as the uplands of SIFR. This is true for all the communities except for those located in the province of Northern Samar. The residents of the latter chose forest conservation as a second priority probably because of the expanse of remaining forest areas in the province against the permanent or semi-permanent farmlands.

Next to kaingin farming and barangay development, majority of the residents in the PRA areas chose forest conservation as the third priority. This is a practical choice, and fits well with the basic assumptions of the community-based approaches to forest management wherein the interventions are focused on first ensuring that the daily and subsistence needs of forest dependent communities are well assured before they can be enjoined actively in forest conservation efforts.

The communities gave last priority to logging as a preferred option for the use and management of the SIFR. This finding has both an encouraging and disturbing implication. First, while the upland barangays are willing to engage in forest conservation activities, they also saw the need not to abandon logging and other resource extractive activities entirely. This could be explained by the fact that those who are engaged in this particular activity derive high income from logging and rattan gathering. As also demonstrated in the PRA results, engagement in logging activities even as a part-time occupation serves as a

hedge against hard times, when harvests are low, and when the need for additional income or cash to dispense with is high, such as during enrollment, fiesta celebration, and in celebrating other important occasions like Christmas and New Year. While it is also encouraging to note that this option was given the last priority, it is still a concern to know that the communities still consider this as an option for the use of SIFR.

7.2 Analysis of Conservation - Livelihood Resource Conflicts

Table 41 shows the conservation-livelihood conflicts as perceived by the communities covered by the PRA study. It should be interesting to note, from their point of view, how recognition is made of the incompatibility of their practices or livelihood activities with the conservation objectives for SIFR. From their own analysis, it is also important to recognize the impact of their economic activities on the biodiversity and the overall situation of the forests of SIFR - habitat destruction, diminishing primary and secondary forests, endangerment of wildlife and other important flora, and other concerns important to policy makers and conservationists.

The fact that the communities have, over the years, continued with such practices and, in most instances, have heightened the intensity of resource extraction in SIFR, simply demonstrate that though they are aware of the ill effects of their actions, these people have no other choice - they have no alternative, they have no other way of surviving and keeping their families and satisfying their basic needs. Thus, without directly asking the questions about their level of awareness of conserving SIFR (which could have resulted in answers which the enumerator expected), the PRA methodology used have helped surface this important finding through the communities' own assessment and understanding of the situation.

One wonders therefore, what kind of strategy would work in a situation like those prevalent in the 18 forest dependent communities of SIFR. It is apparent that there is a real need for timely interventions aimed at improving the current practices such that these are compatible with conservation objectives, and therefore provide a respite for this globally important resource. The function of providing information about the uniqueness and the value the global community attaches to the resource is also something, which the communities understand so that they may cooperate more actively in promoting the proper conservation of SIFR. What is more important however, is to demonstrate that there are better ways of interacting with the resource - in a manner which will not compromise their very survival and at the same time minimize the threat to the endangerment of SIFR.

7.3 Implications for SIFR Management Options

As a natural heritage, the SIFR is a global resource - given due recognition by the decision of the larger community of stakeholders to provide resources through the Global Environment Facility (GEF), to conserve one of the biggest areas of contiguous old growth lowland forests in this part of the world.

While it may be quite ironic that other stakeholders remotely located from the SIFR are willing to pay to conserve it, the communities directly benefiting from SIFR are engaged in unsustainable practices that pose serious threats to the continued integrity of the resource and the biodiversity therein.

Table 41
Perceived Conservation-Livelihood Conflicts and Concerns by PRA Communities

Community activities	Forest reserve zones	Community resources	Conservation conflicts	Community perceived conflicts/Concerns	Primary resource stakeholders e.g., Kaingineros, NTFP Gatherers
Kaingin making (shifting cultivation)	Secondary forest; brush land	Land with sufficient regrowth Pioneer species for firewood Coconut and wild abaca crops	Habitat destruction/loss	Distance/time; land tenure security Loss of forest succession stage Crop damage (bush pigs, birds, rodents)	
Timber cutting	Primary and secondary forests	Quality hardwood species for construction materials	Habitat destruction/loss	Loss of forest regenerative potential	
Non-timber forest products gathering (e.g., rattan)	Primary forest	Time and labor	Habitat destruction/loss	Distance and little knowledge on proper harvesting methods	
Firewood collection	Secondary forest	Time and labor	Habitat destruction/loss	Low availability during wet season	
Orchids and other ornamental plants collection	Primary and secondary forests	Time and labor	Loss of rare, endemic and endangered plant species		
Hunting	Primary and secondary forests	Wild pig, deer and other wild faunal species	Declining wild animal population and loss of endemic species such as Philippine deer	Hunting restrictions	
Fishing	Rivers	Fish stock and other freshwater species	Loss of food sources for endangered bird species	Reduction in quantity and size of fish catch	

Community activities	Forest reserve zones	Community resources	Conservation conflicts	Community perceived conflicts/Concerns	Primary resource stakeholders e.g., Kaingineros, NTFP Gatherers
Mining (e.g., sand and gravel extraction)	River banks and road/mountain sides	Rich mineral reserve	River pollution and fish habitat destruction	No proper management and monitoring of sand/gravel extraction	
Permanent agriculture	Low elevation and plain/moderately sloping areas	Time and labor	Farm area expansion	Land tenure security	

Note: Importance of resource to community, High (H), Moderate (M), Low (L); Shading indicates the key conflict/concern areas as extracted from PRA results.

If one therefore, were to make a decision on the management option for the use of SIFR, whose interests should be considered? What weight should be given to the preference of the various stakeholders relative to the decision making process? Who makes the decision for whom? How will the conflicting interests be reconciled such that the losers understand what they are giving up, and are fully compensated for such loss? Is there an assurance of full compensation for the losers given the uniqueness of benefits that SIFR provides to various stakeholder groups? Are these benefits substitutable?

The purpose of the PRA is precisely to improve the current understanding of the unique interrelationship between the so called forest dependent communities and the SIFR and establish, based on deductive techniques, their perspective on the resource, and their options and preferences for its use and management. It should be emphasized that caution were taken not to influence the outcome of the exercise nor the responses of the participants, by being silent about how valuable the resources and biodiversity of SIFR is to the larger community. What came out may not be what the policy makers, scientists, conservationists, or other advocacy groups may want to hear, but the plain and lucid perspective of those whose lives depend greatly on the nourishment that the SIFR environment provides.

The results of the PRA provide important information in the development of the decision-making criteria and in the formulation of a process of decision making for the eventual use and management of the SIFR. The following generalizations from the study could greatly help in such an exercise. It is important that these information be brought to bear in the final configuration of the management scheme for SIFR.

7.3.1 On Resource Use Pattern

- Swidden and permanent farmlands are expanding (in terms of numbers and locations, but not the sizes of farms) at the expense of secondary forests and brush lands.
- In many communities, the direction of expansion is towards fringes of old-growth forests.
- Intensification of land use is progressing as a result of the conversion of swidden areas into permanent farmlands with the introduction of coconut, banana and abaca. An

indicator of this trend is the cultivation of even brush lands to grow these perennial crops, as well as other fruit trees.

- Rate of resource extraction (timber, rattan and wildlife) is also increasing. This is particularly true in two communities (Barangay Barobo, Can-avid and Barangay Del Remedios, Taft) in Eastern Samar, that PRA participants from these barangays have indicated shifting to this activity from farm-based activities.
- Rattan gathering sometimes entails cutting of its host trees to shorten the time involved, thus causing serious threats to the forest biodiversity.
- The harvesting of 'young' rattan for food, however, poses a problem to the future supply of this important non-timber forest product.

7.3.2 On Community Benefits

SIFR provides a range of direct use, indirect use and non-use values to the local communities:

- Direct Use
 - food
 - income from commercial extraction
 - firewood
 - building materials
 - SIFR as a dwelling place
- Indirect Use
 - transport system
 - soil runoff and water quality maintenance
 - microclimate for crop production
- Non-use Values
 - Existence Value
 - Bequest Value: SIFR as a natural capital where land is passed on to future generations, as in the case of their predecessors

7.3.3 On the Choice of Management Alternatives for SIFR

- Forest and forest dependent communities are direct users of SIFR, largely at levels that provide for their very survival. The valuation of SIFR biodiversity and the formulation of appropriate management approaches should factor in the equation, the value of SIFR for the survival and well being of these communities.
- The choice of any management option should consider the sustenance needs of the forest dependent communities, and should provide benefits that are at least equivalent to the kind and amount of those currently enjoyed by the communities. Particularly, if the communities should be asked to forego benefits arising from conservation-incompatible activities (e.g., timber cutting), they should be compensated in view of the impact this may have on their survival.
- The fact that SIFR offers values which are non-substitutable (e.g., dwelling place and source of life support system and survival) all the more require that communities should be **directly** involved in decision making and management processes.
- There are strong potentials for increasing productivity to increase income and discourage destructive forms of livelihood:

- Allow low impact, low intensity activities such as abaca and banana production, with the right support to establish technical, financial, and market linkages;
 - Provide the right incentives to discourage non-sustainable practices parallel with regulatory mechanisms to maintain harvest rates at sustainable levels;
 - Engage the communities in the actual management and protection of community resources within SIFR through workable forms of incentives such as tenure, and 'community based management schemes' (i.e., communities and local governments working together, in partnership with other stakeholders); and
 - Address the demand side equation that drives the production of timber, rattan, and other wildlife species to commercial levels - if one is serious in confronting the grave threats to habitat destruction.
- Any effort to conserve SIFR should be matched with parallel efforts aimed at improving the condition in the rural areas, so as not to encourage further encroachment towards the upland areas.
 - The subsistence uses of SIFR among forest dependent communities indicate that they pose a low negative impact to the SIFR objectives of conservation. They become in conflict only once the spirit of commercialism is introduced, in the drive to produce more to satisfy a growing and stable market outside the forest areas.

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