

Chapter III

Outcomes and sustainability: Lessons from the ground

Unna Chokkalingam¹, Juan M. Pulhin², Antonio P. Carandang³, Rose Jane J. Peras², Rodel D. Lasco⁴ and Mayumi Q. Natividad⁵

¹ Center for International Forestry Research (CIFOR), P.O. Box 6596 JKPWB, Jakarta 10065, Indonesia

² College of Forestry and Natural Resources, University of the Philippines Los Baños, College, Laguna, Philippines

³ Main Ave., Marymount Village, Anos, Los Baños, Laguna, Philippines

⁴ World Agroforestry Centre, 2F CFNR, University of the Philippines Los Baños, College, Laguna, Philippines

⁵ Forest Management Bureau, Department of Environment and Natural Resources, Quezon City, Philippines

1. Introduction

The Philippines has had a large number of initiatives to rehabilitate¹ its degraded forest lands² over the last century (see Chapter II). These initiatives have evolved in response to changing socio-economic, environmental and political realities; and have varied in scale, objectives, actors involved, funding sources and institutional arrangements. However, the outcomes and long-term sustainability of the efforts have rarely been evaluated.

Since 1960, formal projects and private initiatives combined have supposedly rehabilitated more than 1.7 million ha, but little is known about their status (Esteban 2003, Chapter II). Some claim huge failures with nothing much to show on the ground (Esteban 2003) while others indicate some success with increased forest cover in Cebu and elsewhere (Kummer *et al.* 1994, FMB 2004, Durst *et al.* 2005). Information is scarce on the impacts on biodiversity and watershed functions. Impacts on livelihoods appear varied (Borlagdan *et al.* 2001, Chapter

¹ See Chapter I for details on rehabilitation terminology.

² Degraded forest lands refer to official forest lands in a non-forested state, with brush or grass cover, or under extensive cultivation.

II). Timber from rehabilitated areas contributes little to meeting national needs (Acosta 2002, FMB-FAO 2003).

A field assessment of past initiatives is needed to understand project or site-level outcomes and influencing factors, and to draw lessons to guide future efforts. This chapter presents the results of an assessment of 46 forest rehabilitation initiatives, along with a more detailed appraisal of a subset of 13 cases. The initiatives sampled cover six key implementer groups in three selected regions of the Philippines. The study's specific objective was to increase the chances of success of future rehabilitation initiatives by identifying the approaches and incentives that have contributed to longer-term sustainability and positive outcomes for different stakeholders.

The assessment of success and failure is largely based on the observations of the people implementing the initiatives, but this was “triangulated” with information from project documents and evaluation studies from independent groups where available, as well as focus group discussions with communities in 10 cases. Where available, information from the three sources tended to be similar with regard to how much planting was achieved and whether the rehabilitated area was maintained over time. We have also noted and assessed any differences in opinion when they occurred. Rather than talking about absolute unqualified success or failure, this study looks across project types, breaks down the different outcomes and explores objectively the different factors that contributed to them.

The next section of this chapter discusses the methods used. Then we describe the general characteristics and funding of the initiatives, assess the outcomes and explanatory factors, and finally present the lessons learnt from the analysis. Outcomes and lessons are discussed in relation to physical accomplishments and long-term maintenance; environmental, socio-economic, production, marketing and financial aspects; and performance across multiple criteria and regions.

2. Methods

Three regions — Region III (Central Luzon), Region VII (Central Visayas) and Region XI (Davao) — were selected to represent the three larger areas in the Philippines (Luzon, Visayas, Mindanao) with different underlying biophysical, socio-economic and institutional conditions (Figure 1). Chapter IV discusses the characteristics of these regions. The selection criteria included:

- a) A large number of rehabilitation initiatives in the area.
- b) Many different approaches used.
- c) Different degradation and rehabilitation histories.

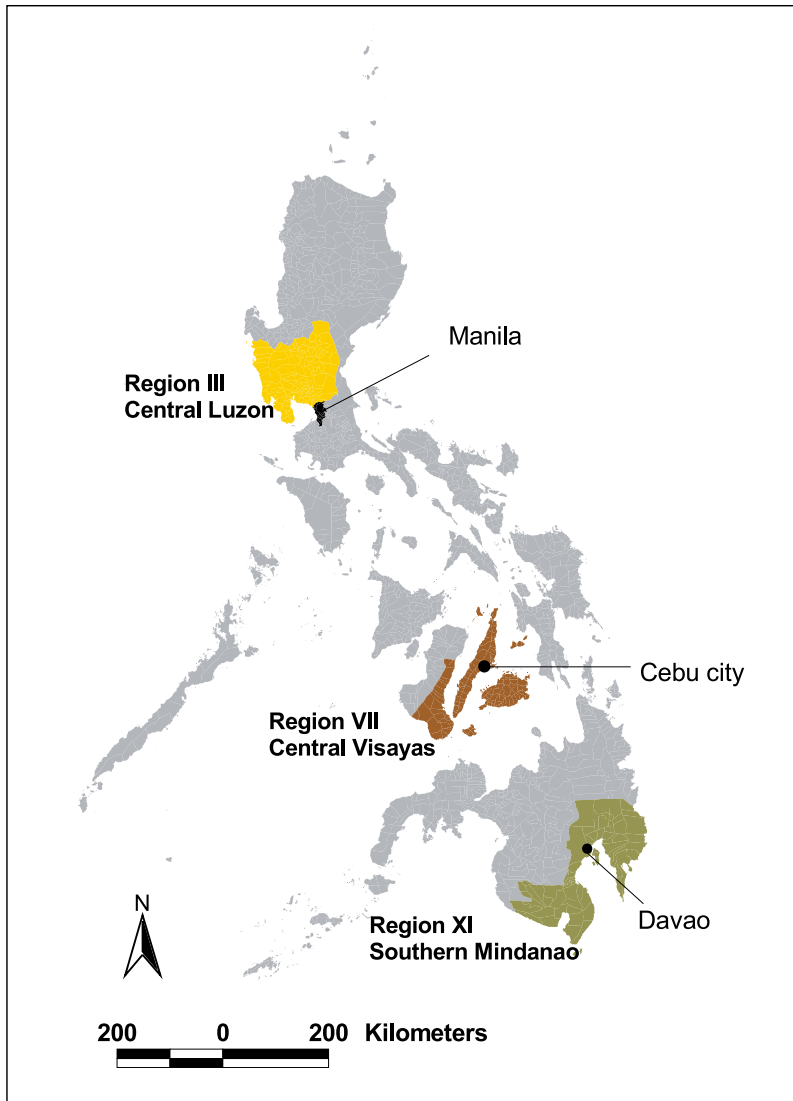


Figure 1. The three regional study areas (Regions III, VII and XI)
 Data source: Center for International Earth Science Information Network

Discussions with experts indicated that the type of agency implementing the rehabilitation initiative had a large influence on the approaches adopted and the outcomes, and would serve as a useful criterion for analysis. Six main implementers were identified: Department of Environment and Natural Resources (DENR), other government agencies (OGA), local government units (LGU), non-governmental organisations (NGO), people’s organisations (PO) or communities, and the private sector. A stratified sample of 46 project sites was chosen to represent the six main implementers across the three selected regions (Table 1). No project lists were readily available in any region and so selection was based on

local knowledge from the regional workshop participants and DENR staff. The sampling resulted in a roughly equivalent number of projects for each type of implementer (6-10) and each region (13-17), allowing for patterns among groups to be compared. Projects here refer to individual project sites or subproject sites for larger national projects. An example is the Balog-Balog watershed subproject site within the larger national Forestry Sector Project Loan II (FSP II).

Table 1. Distribution of 46 sample projects and subset of 13 case studies across six implementer categories and three regions

Project Implementer	Region III		Region VII		Region XI		Total	
	samples	cases	samples	cases	samples	cases	samples	cases
DENR	3	1	1	1	2		6	2
LGU	3		3	1	2	1	8	2
NGO	1		3	1	3	1	7	2
OGA	3	1	2	1	2		7	2
PO	2	1	5		3	1	10	2
Private	1		3	1	4	2	8	3
Total	13	3	17	5	16	5	46	13

The sample (see Annex 1 for project list) is well representative of the broader profile of projects undertaken in the Philippines over the years (see Chapter II). It includes:

- Early DENR projects that were the only ongoing efforts before the 1980s.
- Forestry Sector Loan I *contract reforestation* projects (FSP I) implemented by various sectors.
- Recent FSP II community-based forest management (CBFM) projects.
- Other earlier community-oriented projects.
- Independent efforts by LGUs, OGAs and NGOs from the 1980s to present.
- Private sector efforts from the 1980s and 1990s.

Hereafter, individual projects are referred to by their abbreviated names as in Annex 1.

Many agencies were involved in implementing each project but the project was categorised according to the local actor who played the main role. The only exception was the “Family contract” project, where DENR contracted families to rehabilitate; this should have been in a separate “family or household” category, but was classified as DENR. One project, SRMPC, in which the private sector did the initial rehabilitation and then handed over the area to the community for long term management and use, was classified as private.

A questionnaire, database 1, was developed and used to obtain information on the general characteristics of the 46 projects, the site conditions, the implementation process and results. Data were obtained through project documents available in 26 sites, and interviews with the managers or agency heads implementing or most familiar with the projects in all but two instances. In these last two (Balog and Boljoon), DENR staff were interviewed on PO projects because they were earlier classified as DENR projects. In some projects, a DENR staff member was also present at the interviews and provided information. In six projects, group interviews were conducted. Data were gathered on technical, socio-economic, financial and institutional parameters.

For each of the six implementer categories we selected a couple of projects as case studies (Table 1) and used a second questionnaire, database 2, to obtain detailed information on long-term sustainability and production, livelihood and environmental outcomes. Data were gathered through interviews or focus group discussions with implementing agencies and local communities (see Annex 2 for details). The implementing agencies organised the focus group discussions and issued open invitations to the stakeholder groups on the sites. Differences in opinions or perspectives from different stakeholder groups were noted and separated out in the databases. In two cases, Osmeña and Ihan, only 1-2 representatives of the implementers participated in the focus group discussions and thus only community perspectives were available. In the three private sector cases — IFMA 205, Davao ESP and Alsons — only project staff perspectives were available due to an ongoing insurgency or absence of communities in the immediate area. In the two PO cases, Elcadefe and SRMCI, the communities were the implementers. Besides the 13 case studies, specific information on production, livelihood and environmental service outcomes were also available for 16 other projects with evaluation documents: 10 foreign-assisted, three private sector and three DENR projects.

Evaluation and comparative analyses of the data were conducted using mainly simple descriptive statistics, frequency tables and graphs to look for patterns within and across project types and regions, and differences in opinion among stakeholders. Links between the different outcomes and potential contributing factors (such as project activities, site conditions and policies) were explored. Cross tabulations between nominal variables using Chi-square ($p < 0.05$) and adjusted standardised residuals were used to identify and test how the nominal variables related to socio-economic and institutional aspects contributed to plantations being maintained in the long term. Mann-Whitney tests were used to identify how the ordinal variables related to production and marketing, financial and management aspects contributed.

Further nonlinear principal components analysis (NLPCA) was used to a) characterise the sample projects according to multiple variables related to physical accomplishments; socio-economic, production and marketing, institutional, financial and management aspects; b) explore relations between projects; and c) identify project groups with similar characteristics. NLPCA allows categorical variables (in nominal or ordinal scale) to be used and can deal with mixtures of variables (Kramer 1991, Kroonenberg *et al.* 1997). The technique reduces the original set of variables into a smaller set of unrelated components or dimensions that represent most of the information and allow the relationships between objects to be effectively interpreted. It uncovers both linear and nonlinear correlations between variables. The analysis used the statistical software SPSS v. 9.0 (SPSS Inc. 1999).

An ordinal variable indicating timber production and marketing prospects and outcomes (PMPO) was devised for use in the multivariate analyses through a simple scoring system as depicted below.

PMPO = Marketing strategy + Market prospects + Harvesting experience; where
Marketing strategy = 1 (exists), 2 (none).

Market prospects = 1 (good), 2 (unclear), 3 (poor), 4 (no information).

Harvesting experience = 1 (yes), 2 (young plantation), 3 (trees mature but not harvested).

3. General project characteristics

Many actors were involved in implementing rehabilitation projects on public forest lands in the Philippines: the DENR, OGAs, LGUs, NGOs, communities, private companies, private individual investors and farmer households. Multiple actors implemented single projects (45 percent of the sample). NGOs were involved in supporting most PO projects. LGUs were involved in some DENR, NGO, OGA and PO projects. The DENR was directly or indirectly involved in all projects since it is the primary government agency responsible for managing and administering public forest lands.

Communities or resident farmers were directly involved in decision-making and implementing 37-48 percent of the projects (Table 2). We assessed local community participation in four aspects: a) site selection; b) decisions on rehabilitation methods; c) division of rights, responsibilities and authority; and d) benefit and cost sharing arrangements. Most DENR and private sector projects were not participatory, particularly in benefit and cost-sharing decisions. The most participatory projects were eight PO (excluding PISFFAI and Boljoon), four LGU (CBRMP, CBTF, PNPL, Small Watershed), three NGO (San Agustin, Banika, Ihan) and two OGA projects (PNOC, UDP).

Table 2. Number of projects with medium to high local community participation in decision-making on a) site selection; b) methods; c) division of rights, responsibilities and authority; and d) division of costs and benefits

Project implementer categories	Medium to high participation of local people				Total no. of projects
	In site selection	In methods	In division of rights, authority & responsibilities	In division of benefits & costs	
DENR	1	2	2	-	6
LGU	4	4	3	4	8
NGO	3	3	4	3	7
OGA	3	3	3	2	7
PO	7	9	10	8	10
Private	2	-	-	-	8
Total	44%	46%	48%	37%	46

Local participation was collapsed into a single nominal variable for statistical analyses indicating good participation in all aspects or including benefit-sharing (13), the other aspects (10) and no aspect (17). This was because projects with medium-high local participation in all aspects or including benefit-sharing tended to have high physical accomplishments and maintain their plantations in the long-term, while the projects with no participation in any aspect did poorly. Projects were too few to assess the effects of participation in only site selection, rights and/or methods.

Projects had multiple objectives, up to about 14 each, including environmental to socio-economic and institutional aspects. Increasing forest cover and soil and water management were the dominant objectives across sectors and regions (Table 3). Agroforestry and local livelihoods were most common in PO projects and in Region VII, the latter having a high population density on forest land, coupled with high poverty levels and dependence on forest products (see Chapter IV). Mainly the PO, private sector and half the DENR projects had timber production objectives. Fuelwood and non-timber forest products (NTFPs) were more important in Regions III and VII than in Region XI where wood and NTFPs were still plentiful. Most PO projects had many objectives.

Five main types of institutional arrangements were detected in the sample projects (Table 4) at the time the rehabilitation activities were implemented. Most DENR and OGA projects were pure government efforts with little participation of local stakeholders. Most PO projects were based on CBFM agreements with DENR. CBFM agreements included “community organising” contracts between DENR and other assisting organisations setting out roles, responsibilities and benefit-sharing. Private sector projects were based on industrial and socialised industrial forest management agreements (IFMA and SIFMA) with the DENR,

Table 3. Sample project objectives

No.	Objectives	% of sampled projects
1	Increase forest cover, regreen bare land, set up plantations	80
2	Watershed management, soil and water conservation	80
3	Provide employment/livelihood and/or increase local income	65
4	Timber production (pole/pulp/sawn/plywood)	41
5	Biodiversity conservation	41
6	Agroforestry	39
7	Community empowerment (capacity building, leadership quality, organisation formation & strengthening)	35
8	Environmental awareness enhancement	26
9	Fuelwood	22
10	NTFPs (rattan, bamboo, etc.)	20
11	Gender equality	20
12	Tenure security	20
13	Integrated production system (aquaculture, agroforestry, livestock)	13
14	Fire control	11
15	Carbon sequestration	11
16	Agricultural assistance	4
17	Nursery and pilot plantation	2
18	Showcase	2
19	Research	2
20	Solid waste management	2
21	Charcoal production	2
22	Protect remaining forest from further degradation	2
23	Improve micro-climate	2
24	Minimise insurgency problem	2
25	Technology transfer	2

whereby the private sector leased the land for commercial forestry and submitted detailed plans for development and use through the lease period. There were six “contract reforestation” projects under FSP I where DENR contracted different parties to reforest an area for a fee and turn it over to DENR after three years. There were eight projects where LGUs, NGOs or OGAs developed independent contracts with resident communities or farmers to rehabilitate an area and share responsibilities and/or profits over the long term. Assistance was provided and, in some instances where timber harvesting was not allowed, farmers or communities could get only non-timber benefits. Different tenure agreements are described in Annex 3.

Most projects (89%) were targeted at benefiting local communities, POs, cooperative members or local farmers, while 37 percent of the projects were also designed to provide environmental benefits to the general public. A single

Table 4. Types of institutional arrangements on sample projects during active implementation period

No.	Institutional arrangements (formal & informal)	Project implementer groups					Total	
		DENR	LGU	NGO	OGA	PO		Private
1	<i>Pure Government or NGO effort</i> (may have some informal arrangements with local communities)	5	1	3	5		14	
2	<i>Contracts between DENR and IFMA or SIFMA holders.</i> Could include informal arrangements with LGUs and communities in area						7	
3	<i>CBFM agreements between DENR & POs.</i> Could have informal arrangements with LGU in area					8	8	
4	<i>Contract reforestation under FSP I</i>	1	2	1		1	1*	6
5	Farmer-assisted projects		4	2	2			8
6	<i>Government takes over the claimed cultivated areas</i> and pays the claimants for rehabilitation activities on those lands for three years		1					1
7	Integrated Social Forestry (Certificate of stewardship Contract - CSC)					1**		1
8	<i>PO leases land from farmer and shares profits</i> from products generated in defined ratio			1				1
Total		6	8	7	7	10	8	46

* Then changed to Forest Land Management Agreement (FLMA) and finally a CBFM agreement

** Then changed to *contract reforestation* and finally a CBFM agreement

project could have more than one targeted beneficiary and multiple benefits. DENR projects mainly focused on providing jobs — that is hiring local people to establish plantations (Table 5). Most NGO and LGU projects that aimed to benefit communities sought to provide jobs as well as livelihood schemes³ and benefits through agroforestry, livestock, diverse crops and fuelwood. In one LGU project, claimants were allowed to intercrop but had to leave the area when the project ended after three years. OGA projects mostly planned to provide employment except for PNOC, WMECP, and UDP which planned to include fuelwood, agroforestry and NTFP production, and/or livelihood schemes.

³ 'Livelihood schemes' refers to income-generating activities or projects for communities such as rattan gathering and processing, food processing, livestock raising, and setting up convenience stores. Sometimes farming and growing fruit trees are also considered livelihood activities.

Table 5. Incentives offered by the sample projects to the local communities or farmers

Note: A single project could offer multiple benefits

Incentives to local communities/ farmers	Project Implementer Categories						Total
Direct payments for planting + other incentives below	2	4	2	3	10	4	25
Only direct payments for planting or area development to local people	4	2	1	3		3	13
Other incentives only, no payments for planting		2	2	1			5
No direct incentives			2			1	3
Total no. of projects	6	8	7	7	10	8	46
Incentives other than payments for planting							
Fruit and/or NTFP production*	1	6	3	4	10		24
Livelihood schemes		1	3	2	9		15
Timber production*		1	1		9	1	12
Fuelwood production*		1	2	2	5		10
Financial assistance & credit facilities		2			3		5
Seedlings and other inputs to farmers		1	2	1		2	5
Profit-sharing with local people		1	1	1		1	4
Environmental payments to farmers		1		1			2
Agricultural projects for employees' income						1	1
Future ecotourism benefits		1			1		2

* Products to be harvested directly by local people.

An LGU (CBTF) and an OGA project (WMECP) paid farmers for not burning the area. However the payments were only made during the project period and did not compensate for long-term opportunity costs. All PO projects except for PISFFAI aimed for a true mix of benefits including agroforestry, timber production, employment, livelihood schemes and fuelwood. Private sector projects primarily aimed to provide returns to the private individual or company investors, but half also sought to benefit communities, mainly through jobs. Davao ESP planned to share 10 percent of its profits with the community. Many projects across sectors allowed intercropping during the first few years.

Target areas varied widely, from one ha to 23,444 ha per project or subproject site. Fifty nine percent of the project sites were < 500 ha, with 33 percent < 100 ha. Only three projects or six percent had a target area of > 4000 ha. Projects or subprojects funded by DENR or foreign loans tended to have larger target areas (61 percent of the 23 projects > 500 ha), compared with projects funded by foreign grants, private sector, LGUs or OGAs (25% > 500 ha).

Most sampled sites were < 1000 m elevation, had rolling to moderately-steep to steep slopes with clay loam to sandy loam soils. They were mostly on public forest land, with five projects having a little “alienable and disposable land”⁴. Within public forest land, most projects were on timberland⁵ (74%) while 17 percent were on forest reservations designated for specific purposes (mostly watershed). Five project sites included some protected area. OGA projects were mostly on forest reservations and protected areas, while the other projects were mainly on timberland.

Intensive logging (56 percent of the sites), *kaingin* or slash-and-burn cultivation (56%), fire (52%), fuelwood extraction (41%), grazing (32%) and drought (14%) were the main factors that led to the degradation of the 46 sites to be rehabilitated. The sites had been degraded for < 20 years in 19 projects and > 20 years in 19 other projects. Most project sites (71%) were dominated by open grass, shrub or barren cover (Figure 2). Planted trees, agricultural crops and natural forest formed < 50% cover in 11, 19 and 18 sites respectively. Four sites had significant areas (> 75% land cover) under cultivation by local communities.

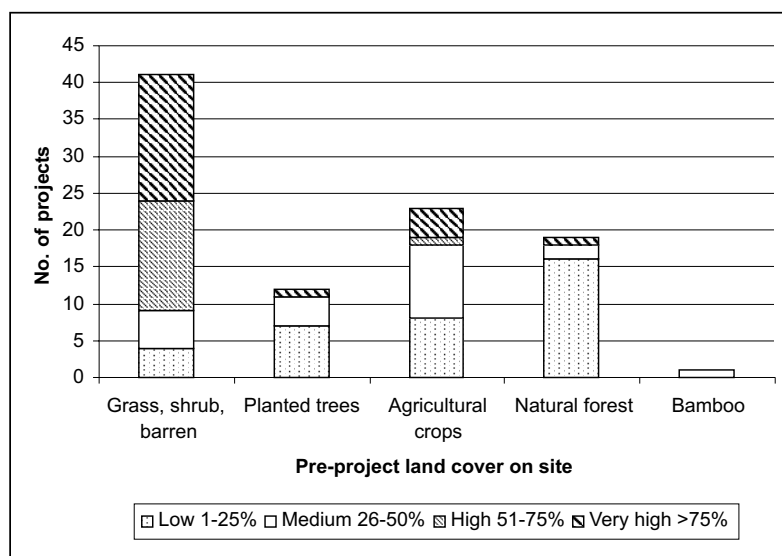


Figure 2. Pre-project land cover on 45 sample project sites with information

⁴ Alienable and disposable lands refer to lands that have been officially classified as not needed for forest purposes. They are open for conversion to alternative use.

⁵ Timberland refers to public forest lands zoned for timber production.



Fire use in the KALIWA watershed project site. (Environmental Forestry Programme, CFNR, UPLB)

4. Funding for rehabilitation and long-term management

Most DENR, OGA and private sector projects were self-funded while NGO projects were largely funded through foreign grants (Table 6). Various sources funded LGU projects. PO projects in the sample relied mainly on two large FSP II loans from the Asian Development Bank (ADB) and the Japanese Bank for International Cooperation (JBIC) in the mid-1990s to 2003 with DENR providing counterpart funding. In addition, seven ADB-loan funded FSP I project sites were distributed across the implementer categories. Foreign-assisted projects tended to be of short, fixed duration of ≤ 10 years.

Table 6. Funding sources for sample projects

Project Implementer categories	Funding sources									Total no. of projects sampled
	DENR	LGU	NGO	OGA	Comm-unity	Private	Foreign grant	Foreign Loan	PMS*	
DENR	5		1				2	1		6
LGU	3	4					2	3	1	8
NGO	1		2	1	3		5	1		7
OGA	2			6			1	1		7
PO	10							9		10
Private						6		2		8

* Presidential Management Staff

Note: A single project could have been funded by multiple agencies.

Costs per ha rehabilitated were available for 37 projects and actual cost incurred was considered in most samples. Striking differences in cost/ha were visible when analysed across funding sources. Pure government-funded (by DENR, LGU and OGA) projects tended to be \leq P10,000⁶/ha. FSP loan projects cost more, with the majority falling between P5000 and P30,000/ha. Projects funded through foreign grants and a World Bank loan were much higher at $>$ P30,000/ha. Most private sector projects cost \geq P20,000/ha. In general, DENR-funded projects tended to rehabilitate large areas at low cost/ha, while foreign loans helped plant large areas at higher cost/ha (Figure 3). LGU/OGA funding helped rehabilitate small areas at low cost/ha while foreign grants and private funding tended to plant limited areas at high costs/ha.

	Low cost/ha	High cost/ha
Small target area	LGU/OGA funding	Foreign grants Private sector funding
Large target area	DENR funding	Foreign loans

Figure 3. Comparison of cost/ha versus target area for projects funded through different sources

Budget constraints limited spending on government projects but it may also be that the costs were underestimated and did not include items such as staffing and overheads. Costs in foreign-assisted projects included community organising and other activities that helped sustain the rehabilitation efforts in the long term. These activities are not usually a part of regular government projects. Besides, costs incurred at different times are not fully comparable, since they reflect the value at the time incurred, and not the present value. Therefore, the costing analysis above serves only as a rough indicator.

Many projects (19) depended purely on forthcoming government allocations, grants or loans (including establishing links with different agencies and training to seek funding) to manage the rehabilitated areas in the long term. These included all DENR projects, roughly half the LGU, OGA and NGO projects, and three of the 10 PO projects. Fourteen projects planned reinvestment using returns from timber harvests, alcogas production⁷ (Dendro project), and various livelihood

⁶ Conversion rate roughly 50 Philippine Pesos for one US Dollar.

⁷ Ambitious alcogas production program by the Marcos government, where all state colleges and universities were given timber production projects with timber to be subsequently purchased for alcogas production as an alternate motor fuel (Armas and Cryde 1984). The 1986 revolution toppled Marcos and the program ended.

schemes. These included the private sector and a small proportion of the LGU and PO projects. Five PO projects and one LGU project would attempt a combination of the above two strategies. Five OGA/LGU/NGO projects expected the farmers to adopt and manage the reforestation efforts themselves. One OGA project by the National Power Corporation planned for a percentage of the monthly electric bills to be paid into an environmental fund to be used for reforestation.

5. Project outcomes and explanatory factors

5.1 Physical accomplishments and long-term maintenance

Most projects managed to plant the target area (37 projects planted ≥ 70 percent of the target area) (Figure 4). However, only 28 projects had high average initial survival ($\geq 80\%$) of species planted. Species-site matching was the main technical problem leading to poor short-term survival and/or growth on 11 sites. Species such as *Gmelina* (*Gmelina arborea*), narra (*Pterocarpus indicus*), mahogany (*Swietenia macrophylla*), teak (*Tectona grandis*) and mango (*Mangifera indica*) in particular succumbed or their growth was affected by cold, drought, poor soils or strong winds. Other reasons for low initial survival included fires on three sites, no maintenance on two sites, and handling and transport damage and farmer disturbance on two sites.

Pests and diseases were not a serious problem on most project sites, thanks to the numerous species planted per site. Few artificial control measures were taken. For the record, 16 types of pests and diseases were noted on 29 projects, the main ones being stem and leaf borers, rats, and psyllids. Psyllids affected the ipil-ipil (*Leucaena leucocephala*) monoculture plantations.

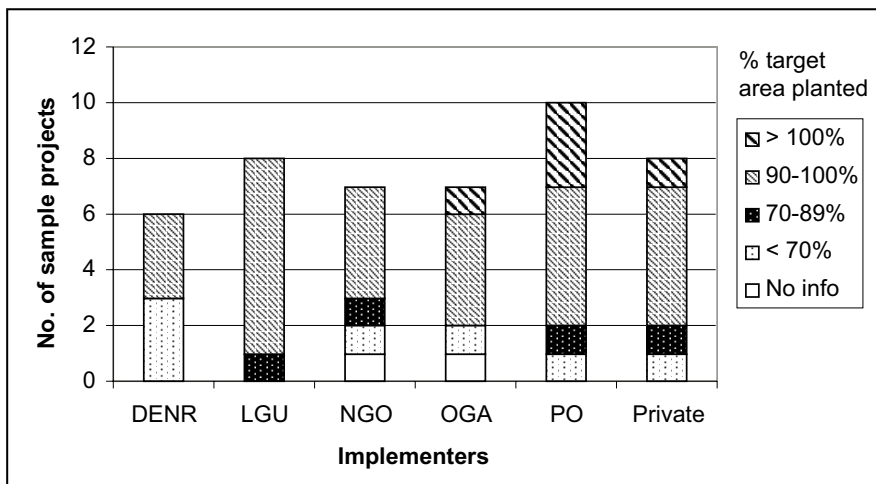


Figure 4. Percent of target area planted by sample projects

In the long-term, 28 projects still retained most of the area rehabilitated while in 12 projects the areas rehabilitated were fully or partially degraded or destroyed. In six projects that were recently initiated it was too early to judge. The 28 projects that retained the area rehabilitated had in common significantly reduced human pressures (24 sites) and continued maintenance and protection (27 sites, although limited by funding on three sites). Human pressures were reduced through protection and/or ensuring local community benefits and stake in the projects. The main patrol and protection measures included foot patrols, firebreaks, forest protection committees, and watchtowers or checkpoints. Maintenance and protection was continued because funding was available and/or managers had long-term plans and direct stake in the projects.

The 12 projects⁸ that eventually lost much or all of their plantations included three DENR, three LGU, three OGA, one NGO and two private sector projects. They seem to have failed from just about every perspective — socio-economic, financial, management and production — as indicated below.

- High demand for wood, fuelwood, grazing and *kaingin* continued with associated fires. Six projects had no protection measures except for firebreaks. Eight projects had short-term or unstable funding and were terminated with little or no continued maintenance and protection after their funding ended. One LGU project had low government support and monitoring and was affected by fire. One OGA project could not harvest timber as per plan due to contradictory policies. Two companies in Region XI were affected by insurgency or poor community relations, as well as high operational costs and low market prices not allowing for cost recovery. Six projects had unresolved conflicts over land tenure, encroachment, illegal use, or rebel activity even during the project period.
- Four projects had no information on income changes while the remaining eight provided only short-term employment with no long-term income or other benefits to local communities. Eleven projects had limited to no local participation in decision-making on site selection, methods, rights and responsibilities, cost and benefit-sharing. Six of these were pure government (DENR, LGU and OGA) or NGO efforts and two were private IFMA agreements on public lands with local claims, yet no formal involvement of the communities or claimants on the ground. Two were *contract reforestation* projects under FSP loan I with no planned long-term benefits for local people.

Cross tabulations between nominal variables (See Table 7 for variable categories and codes) using chi-square ($p < 0.05$) and adjusted standardised residuals to test and identify the relations suggest that long-term maintenance of plantations is

⁸ Family contract, DVSO, Pasian, CBCR, LGU contract, MTP, Kalinan, Dendro, Pantabangan, WMECP, Alsons and Davao ESP.

positively related to: low degrading pressures⁹, CBFM arrangements, high local participation or PO implementation, provision for timber and non-timber benefits and livelihood schemes to communities, positive livelihood outcomes, and no unresolved conflicts. Long-term maintenance was negatively related to unresolved conflicts, poor local participation, providing only short-term employment to local communities, and high degrading pressures. It did not have a strong relationship with tenure security, funding source or implementers other than POs. Mann-Whitney tests showed the three ordinal variables of timber production/marketing prospects and outcomes, long-term management plan, and financial viability were all positively related ($p < 0.05$) to long-term plantation maintenance.

Table 7. Variables included in statistical analysis and categories in each

Variables	Categories & Codes
1. Average % survival in the short term	<60, >60
2. Plantations maintained in the long term	Yes/No – ply/pln
3. Degrading pressures	Low/High – DL/DH
4. Funding source	DENR, FG – foreign grant, FL – foreign loan, LGU, OGA, Pvt – private
5. Institutional arrangements	FR – Assistance/contracts with farmers or communities to plant and benefit long-term CBF – CBFM & CSC CR – <i>Contract reforestation</i> IF – IFMA & SIFMA Gov – Pure government/NGO effort
6. Planned socio-economic incentives (8 categories)	E – Employment only Nt – Non-timber products only NtL – Non-timber & livelihood schemes P – Profit sharing PLNt – Profit-sharing, livelihood & non-timber T – Timber TLNt – Timber, livelihood, non-timber None
7. Local participation	Good, Some, Low to none – PG, PS, PL
8. Land tenure security	Good, Moderate, Poor – TG, TM, TP
9. Livelihood outcomes	Good, Poor, Not Applicable – LG, LP, LNA
10. Unresolved conflicts	Present/Absent – UC/NC
11. Timber production/marketing prospects & outcomes (PMPO)	Scores from 3-10, 3 best. T3-T10
12. Financial viability	Scores from 1-9, 9 best. F1-F9
13. Long-term management plan	Scores from 1-9, 9 best. M1-M9

⁹ Degrading pressures refers to human pressures such as excessive logging and fire use that lead to removal or degradation of forest cover.

Considering all physical accomplishments including target area planted, short-term survival and area maintained long-term, PO, private and NGO projects appeared to be doing better than the government projects. Poor performance of government projects can be largely attributed to low community involvement leading to fire and other disturbances and/or insufficient ad hoc financial support, which constrains planting and continued maintenance.

The individual projects assessed in this study generally met their planting targets, but Esteban (2003) indicates that the country's ambitious overall planting targets were not achieved. National plantings fell short overall between 1960 and 1987, were < 50 percent of the national targets under the Master Plan for Forestry Development from 1990-2000, and 75 percent short of the 2001 target. The government set a target of over 500,000 ha for private sector planting from 1991 to 2015, but so far there are few industrial tree plantations.

Esteban (2003) states that information on survival, age classes, growth and yield for the nation's reforestation efforts is limited. Not much is known about the status of the 1.5 million ha said to be reforested by 1995. Performance has largely been measured in terms of target accomplishment and seedling survival; and not on plantation quality, growth and yield and community organising. Chapter II based on a literature review refers to low survival (< required 80%) and major pest and disease problems because of fire, poor species selection, site matching, large areas planted to single species, disregard for quality and poor silvicultural practices.

We found such survival and growth problems in 11 of 39 sites studied, although pests did not appear to be a major issue and most sites had actually planted multiple species. We found that 12 of 46 sites eventually lost much or all of their plantations, but 28 sites still retained most of the rehabilitated area although future sustainability is uncertain on many of them. Esteban (2003) suggests that *contract reforestation* under FSP I was largely a failure with nothing much to show on the ground eventually. This study's data on specific *contract reforestation* project sites supports that conclusion.

Average short-term survival rates reported in the literature for FSP I sites (64-68%), FSP II (average 71% and a high of 93%) and the Pantabangan area (78% in second year) match those found on our FSP I, FSP II and Pantabangan sample sites (DENR and JICA 1987, Baggayan 1996, Chapter II on DENR records for FSP).

5.2 Environmental outcomes

5.2.1 Water and soil parameters

Most projects analysed (38/46) had explicit water and/or soil improvement objectives. Of these, 26 had information on soil and water outcomes. Twelve case studies had detailed information and many FSP II CBFM project final reports included some evaluation based on casual observation. Most projects (33/46) included water and soil conservation measures. Cover cropping (64%), hedgerows (36%), mulching (30%), rock wall (24%), contour planting (18%) and terracing (15%) were the key measures adopted.

Respondents or documents indicated that most projects had neutral to positive effects on soil properties, soil erosion, water quantity, dry season flows, peak flood levels, water quality, landslide frequency or overall soil and water conservation (Figure 5). Four case studies provided information suggesting that water levels increased or become more stable and the sites were now able to supply water to far-off *barangays*¹⁰. Three case studies referred to observed changes in sedimentation. Responses varied between project staff and local communities in five of the six case studies where both groups were surveyed. Also responses often varied among different community members or project staff when interviewed separately, so consensus in the focus group discussions are considered to be the main responses from each group.

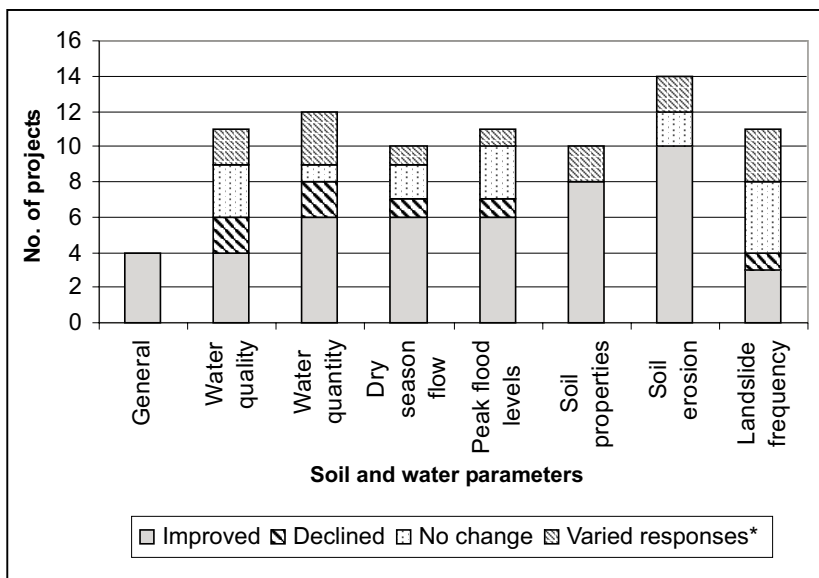


Figure 5. Water and soil property outcomes on sample projects from pre-project to present time

* Varied responses between project managers and local communities as expressed in focus group discussions.

¹⁰ Barangay – the smallest political unit in the Philippines and often corresponds to a village or town district.

Most improvements in water or soil parameters were attributed to tree planting itself, though hedgerows and contour farming were also mentioned (mainly in PO projects), along with strict protection of rehabilitated areas. Declines in services were attributed to *kaingin* cultivation, fire use, illegal wood harvesting (WMECP and SRMCI projects), population increase and climate change.

However, the information on water/soil outcomes is debatable because none of the projects had specific technical evaluations of their impacts on water and soil properties. Information was based largely on manager, community or evaluator's perceptions and responses often differed both between project staff and local communities and within each group.

- In the Family contract project, the communities believed water quality and quantity improved in the short and long term. However, the DENR staff believed the improvement was only short-term. Water levels in the dam did not actually increase but appeared to do so simply because the dam was silting up. Communities also believed there was less soil erosion and landslide frequency whereas DENR staff claimed there was no change.
- In the PNOC project, the communities believed landslides had become less frequent over the long-term whereas the project manager believed the opposite.
- In the Piwardep project, contractors said water quality and soil properties did not change but project managers said soil properties improved and sedimentation was reduced.
- In the San Agustin project, the managers said water quantity, dry season flow, peak flood levels, soil properties, soil erosion and landslide frequency had worsened or not changed, while local communities said they had improved.
- In the Small Watershed project, communities believed there was more water while project managers did not.

Such widespread perceptions of links between forests and water, without much scientific evidence, has been a key driver of Filipino forestry policies, with environmental advocates pressuring the Government to impose nationwide logging bans after major floods. Following the flash floods in Aurora and Quezon provinces in December 2004, the Government imposed a nationwide logging ban on all public forest lands, with no differentiation between protection and production areas, including those with CBFM, IFMA, SIFMA, FLMA and other tenure agreements. A study by the Forestry Development Centre of the University of Philippines at Los Baños (FDC 2005) suggests that the flooding damage had little to do with logging and more to do with the area's geology and the extremely heavy rains, which exceeded the land's absorption capacity. Whole trees with roots were washed down by these floods.

Links between landscapes and water are complex and all downstream water problems cannot be attributed simplistically to upstream logging (van Noordwijk 2006). FAO and CIFOR (2005) report that forests can affect peak river flows and floods on a small-scale, but their effects on major flood and landslide events over a large basin are relatively small. Even in local areas, outcomes are also influenced by the kind of landscape, rainfall, geology and topography in addition to forest cover and management.

The automatic policy response for major flooding and landslide problems in the Philippines has been spending lots of money on reforestation (Walpole 2006), with little consideration of whether it could actually solve the problem, how it should be designed to do so and how to sustain the effort in the long-term. As indicated above, communities and managers tend to believe tree planting in itself can help improve all soil and water parameters. However, Sidle *et al.*'s (2006) review for Southeast Asia suggests that revegetation and management practices could either exacerbate or reduce vulnerability to surface soil erosion and shallow landslides, depending on the type of activities involved. Plantation monocultures with little ground cover and litter could have high surface runoff and soil erosion.

Since December 2005, government and public perceptions of the link between forests and floods/landslides appears to have shifted slightly, coinciding with the widespread dissemination of the report on forests and floods by FAO and CIFOR (2005). Heavy flooding in Mindoro in December 2005 and a massive landslide in Leyte in March 2006 were not immediately blamed on logging and deforestation for the most part, but attributed to unstable geology and very heavy rainfall. A more cautious approach has been adopted with geologists being assigned to check these and other vulnerable areas.

5.2.2 Biodiversity conservation

A sizeable number of the projects (19, or 41%) had objectives related to conserving or enhancing biodiversity, mainly PO, OGA and DENR projects. Table 8 presents information on changes in flora and fauna from pre-project to present time for projects with and without biodiversity objectives. Except for one study with an inventory (OGA Dendro project), the other responses are based on local observations and opinions obtained from the case studies or project evaluation reports of some sites. Respondents also linked changes in the number of hunters in the area to changes in wildlife populations. When opinions differed among managers and communities in the case studies, the opinions of the communities on the ground were applied.

Most projects with information indicated that floristic and wildlife diversity improved from before the project to the present (Table 8). They attributed the change mostly to the establishment of multi-species plantations and the planted trees attracting birds. Respondents attributed declines in floral diversity to a few plantation species replacing more bio-diverse brushlands, and declines in wildlife populations to tree cutting and hunting pressures.

Table 8. Biodiversity outcomes based primarily on observations and opinions

	Change from pre-project to present	Projects with biodiversity objectives *	Projects without biodiversity objectives**	Total
Flora	Increase	6	3	9
	No change	1	2	3
	Decrease	1	1	2
Total		8	6	14
Fauna	Increase	8	8	16
	No change	1	2	3
	Decrease	1	1	2
Total		10	11	21

* includes five case studies

** includes seven case studies

Given that improved floristic diversity was largely attributed to planting multiple species, we examined the number of species planted and their origin (Figure 6, Annex 4a and b). Overall, a number of species were planted per project site. Further, projects with biodiversity objectives planted more species (average 7.2, CI¹¹ 6.2-8.2) than projects without biodiversity objectives (average 5, CI 4.1-6.0). Also, 30 percent (CI 23-37%) of the species planted on a site tended to be native with little difference between projects with and without biodiversity objectives. Twenty percent of the projects had more than 50 percent native species.

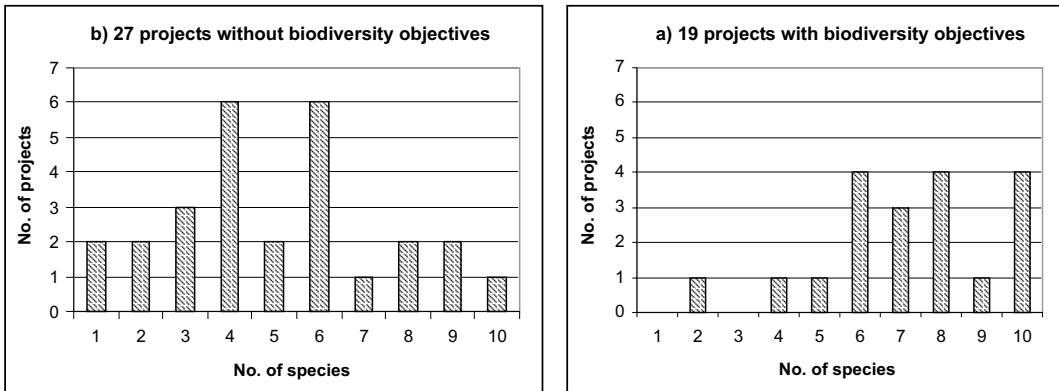


Figure 6. Number of planted tree species in: a) projects with biodiversity objectives, and b) projects without biodiversity objectives

¹¹ CI- 95 percent confidence interval of estimate.

It was mainly *contract reforestation* sites under FSP I that planted only a few species, namely *Gmelina arborea*, mahogany and *Acacia* species. Other than that, projects of all sectors tended to plant many species. However, at the landscape level, mahogany and *Gmelina arborea* may have become more dominant because they were commonly planted on most sites.

Planting trees was the dominant rehabilitation method, with some planned natural regeneration in 14 projects. Of the case studies with information on natural regeneration status in the plantations, the four with biodiversity objectives had high to very high regeneration while only two of six cases without biodiversity objectives had high regeneration.

A positive finding is that tree planting was done primarily on open grass, shrub or barren land in all project sites (degraded land, Figure 7) and not by converting natural forest which would have resulted in a net loss in biodiversity. Natural forest was retained for the most part with new natural forest being regenerated in four project sites.

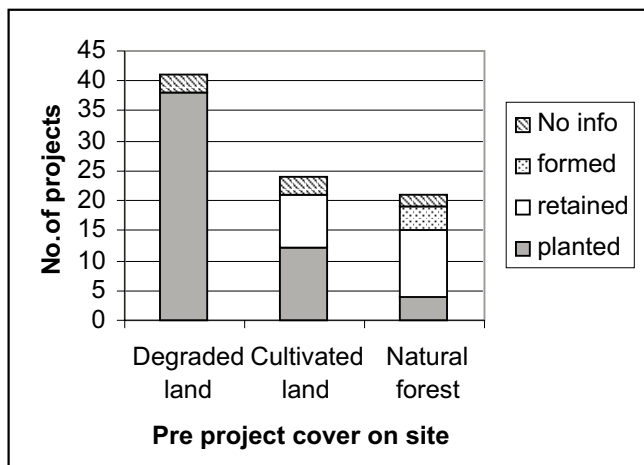


Figure 7. Land cover/use change with project implementation on sample sites: Degraded land, cultivated land or natural forest planted, retained as is, or newly formed

Durand and Monteuis (1995) also reported that a large number of tree species were being used in reforestation efforts by two private companies and a government project in Mindanao. The literature review in Chapter II suggests that most species planted are exotic and this raises biodiversity concerns. We find that native species do form a significant component of the species planted on the projects assessed in this study, but perhaps projects with primarily conservation objectives such as in protected areas could focus largely on native species. The general literature

provides little information on how rehabilitation efforts affect biodiversity in the Philippines with which our results could be compared. Sayer *et al.* (2004) in their global review indicate that many plantations contribute significantly to biodiversity, though clearly nowhere near the contribution of natural forests. They contribute by allowing natural vegetation in the understorey, catalysing native species regeneration, providing significant wildlife habitat, and retaining small natural forest fragments. However, Cossalter and Pye-Smith (2003) point out that the degree of contribution depends on the specific species and site and the way the plantations are established and managed.

5.3 Production and marketing

Most projects (38) planned to produce one or more economic products from the rehabilitation effort: timber, fuelwood, fruits and other non-timber crops or ecotourism (Table 9). The eight remaining projects focused on increasing forest cover, providing environmental services and/or employment in planting activities. Four of these latter projects were rated as failures and one had no rating, indicating that projects with economic production objectives may provide better incentives for long-term management interest and sustainability.

Table 9. Planned production on sample projects

Project implementer categories	Planned production				No production objectives	Total no. of projects sampled
	Fruits & other non-timber products*	Timber	Fuelwood/ charcoal	Ecotourism		
DENR	3	3			2	6
LGU	6	1	1	1	2	8
NGO	3	2	2	1	2	7
OGA	4	1	3		2	7
PO	10	9	5	1		10
Private	4	7	3	1		8
Total	30	23	13	4	8	46

* Includes cash crops such as rubber and coffee

Note: A single project could aim to produce more than one product

Of the 12 sample projects that were unable to maintain their plantations in the long term, eight had no timber production objectives; one had no production plans, prospects or experience; one faced contradictory harvesting policies; and two private company projects were not financially viable due to high operational costs and low market prices. This suggests that producing timber is important for ensuring the long term sustainability of rehabilitation projects.

5.3.1 Timber and fuelwood

The 46 rehabilitation projects planted around 35 timber species. The dominant species were mahogany, *Gmelina*, *Acacia mangium*, narra, *Acacia auriculiformis*, *Eucalyptus deglupta*, teak, ipil-ipil, falcata (*Paraserianthes falcataria*), molave (*Vitex parviflora*) and agoho (*Casuarina equisetifolia*) (Annex 4a). Expected rotations were seven-12 years for *Gmelina* and 12-18 years for mahogany and teak. The remaining species were mainly found in only one or two projects and 17 of them were native species.



(Left) *Eucalyptus deglupta* in Davao del Sur, (Right) Coppice regeneration of *Gmelina arborea*.
(Photos by Antonio P. Carandang)

So far, there has been little harvesting and marketing of timber on the 25 projects with timber and fuelwood production objectives (Table 10). Fifteen project sites had trees mature enough to be harvested for timber but only six had actually done some harvesting in the rehabilitated area.

We explore the key constraints to timber production and marketing below. Other reviews have noted similar problems with commercial plantation development in the Philippines (Gayo 2000, Acosta 2002, Esteban 2003, FMB-FAO 2003):

1. Most rehabilitation projects, except private sector projects, had no realistic plan for production, although the feasibility studies foresaw marketing. The private sector and NGO projects appeared to be doing better in timber production compared to the DENR and PO projects. DENR projects lacked production plans and implementation even though production was one of their objectives

Table 10. Presence of marketing strategy, mature trees and harvesting experience on the sample projects with timber and/or fuelwood production objectives

Responses	Project implementer categories						Total
	DENR	LGU	NGO	OGA	PO	Private	
Marketing strategy							
Absent	3	2	2		6		13
Present				2	3	7	12
Total	3	2	2	2	9	7	25
Mature trees							
Absent		2		1	6	1	10
Present	3		1	1	2	6	13
Present -fuelwood			1		1		2
Total	3	2	2	2	8	7	25
Harvesting operations							
Not conducted	3			1	2	3**	9
Conducted: timber and/or fuelwood use & sale			2		1		3
Conducted: timber in 1999-2001						3	3
Total	3		2	1	3	6	15

** Also harvested from natural forest only

and they carried out economic feasibility analysis at the start. The problem is that the DENR line officer’s role is to regulate utilisation and the private sector has traditionally done most extraction. Once DENR projects end, nobody in the agency is responsible for production. CBFM projects have been very short-term in nature and typically end long before production benefits are supposed to accrue. They assume production and marketing will happen automatically but the DENR and the communities may not be prepared to handle these aspects. One PO (KMYLB) did not harvest due to funding limitations.

2. The OGA WMECP project suffered a harvesting policy conflict, with Presidential Decree (P.D.) 705¹² banning cutting and the Letter of Intent (LOI) 1002¹³ allowing cutting. P.D. 705 prohibits timber harvesting in critical watersheds with infrastructure such as hydropower plants and irrigation systems. This may make it difficult for projects to obtain permits to harvest in critical watershed

¹² P.D. 705 dated May 1975 (Revised Forestry Code of the Philippines, as amended by P.D. 1159) defines the basic Government policy on establishing forest tree plantations and the lands to be reforested, and establishes the Forest Management Bureau’s jurisdiction over all forest land.

¹³ LOI 1002 – NIA was given jurisdiction over Pantabangan and Caranglan watersheds for conservation, rehabilitation and management. LOI 1002 allows timber harvesting.

sites despite timber marketing being approved in their initial rehabilitation and area development plans. This includes many of the PO sites of the recently-completed FSP II which await government decisions in this regard. Confusion regarding harvesting rights exists not just in critical watershed sites but in all watershed areas due to conflicting or unclear policies and varying interpretation and implementation at different levels of government (FMB-FAO 2003). Communities in other LGU (CBTF and Piwardep) and NGO (Banika) watershed project sites hope to be able to harvest in the future. Soriaga (2006) mentions that the very term “watershed” can evoke fear and insecurity among upland dwellers because government has traditionally restricted access to resources and displaced communities when proclaiming watershed areas. Harvesting in protected areas is also restricted and in the DENR Osmeña project, communities have applied for a PACBRAMA¹⁴ to harvest in the permitted sections.

3. Financial viability of rehabilitation efforts has been low due to the high plantation establishment and operational costs (two private companies in Region XI), and poor and unstable timber markets for *Gmelina* and mahogany (on five sites). Market prospects¹⁵ were generally better in Region VII compared with Region XI (Figure 8). Region VII does not have much forest but is a booming market centre for rattan, charcoal and wood, and also imports much raw material from Indonesia and elsewhere in the Philippines. Region XI has a lot of forest. The two private sector projects there believe that it is not possible to recover high plantation establishment costs only by selling timber, so it would be good to combine trees with other high-value crops such as rubber and sugarcane.

Much of the current timber demand in the country is met from imports or illegal logging in natural forests (FMB-FAO 2003). Timber from rehabilitated areas contributes little at the moment. Removal of barriers and reduced tariffs on timber imports makes it hard for domestic producers to compete against cheap imports and that hurts farmers, local communities and companies who have been encouraged to plant trees (Shimamoto *et al.* 2004). High transport costs due to poor roads and long distances to markets are also mentioned by Calderon and Nawir (2004) in their review of the financial feasibility of six IFMA and CBFM projects.

¹⁴ PACBRAMA – ‘Protected Area Community Based Resource Management Agreement’ is awarded in protected areas occupied by communities with privileges similar to CBFM but with some restrictions under the NIPAS Act (RA 7586). It mainly includes minor forest product utilisation but could also involve timber harvesting in multiple-use and buffer zones. Buffer zones tend to be alienable and disposable lands and multiple-use zones may have agroforestry and other plantations.

¹⁵ Market prospect ratings were based primarily on the presence of buyers (including forest-based manufacturing enterprises) and good prices in the accessible vicinity.

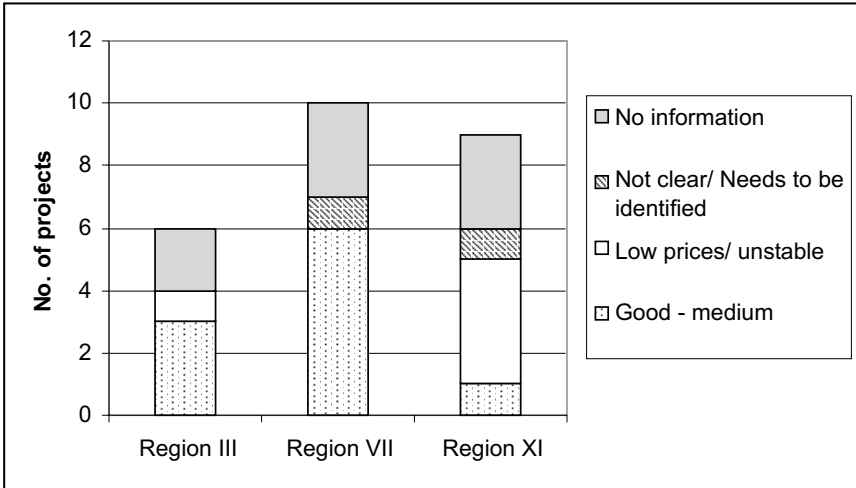


Figure 8. Market prospects for the sample projects across regions

4. Government and other agencies provide inadequate marketing support on five sites, mainly in Region XI. Little effort has been made at the national or local levels to provide marketing support to the producers, other than declaring Regions XI and XIII as timber corridors. The Provincial Environment and Natural Resources Officer of Region XI recently organised a multi-sectoral group to look at commercial timber production in CBFM and private sector lease areas. Austria (1995) reports on an FAO-supported pilot effort to develop local, community-based market information systems on three integrated social forestry project sites in Regions II, III and VI. The trials helped producers to enhance their bargaining power with traders and adapt their management systems to price trends and fluctuations. The government was attempting to institutionalise this information system, but the outcomes are not known.

5. All projects need to obtain approval of their resource use plans and obtain harvesting permits which can be hard to secure due to tedious bureaucratic requirements. Lack of clarity at the field level about policies, which are constantly changing, also makes it difficult to issue permits. DAI (1999) says that the DENR approves only a fraction of the harvesting volume that forest inventories and affirmed management plans show to be sustainable.

An unstable policy environment and poor support for forest production may be increasingly affecting rehabilitation and long-term sustainable management, particularly by communities and the private sector (FMB-FAO 2003). Since 1998, resource utilisation permits have been suspended three times nationwide which negatively affected timber production at rehabilitation project sites. Environmental advocates in the Philippines often consider all timber harvesting destructive and

they have pressured the Government into banning logging nationwide following major floods. Logging has also been suspended due to concerns that CBFM or IFMA contracts are being misused in order to engage in illegal logging. The December 2004 ban was subsequently lifted in Regions XI and XIII and then re-imposed in Region XI following reports of illegal logging. The ban was then lifted for a few IFMAs in other regions. In January 2006, the DENR cancelled all private and community contracts in eight regions, reportedly because of contract violations and non-compliance. In early March 2006, the cancellation of CBFM agreements was put on hold following a plea by the PO federation to avoid displacing 1.4 million people and leaving 1.6 million ha unprotected. Decisions to impose or lift logging bans were poorly justified and the bans have often been used as tools to shift public opinion and deflect the blame for disasters from the parties or authorities in power.

In general there is strong lobbying against production forestry and this is closely linked to the old dictatorship, exploitative practices, corruption and abuse of regulations (Acosta 2002). Such thinking has extended further to opposing forest plantations and increased pressures to impose a total commercial logging ban. The country has been unable to pass legislation on sustainable forest management and utilisation for the last 15 years and policies have been driven by DENR administrative orders, memorandum circulars and orders responding to the pressures of the time. The last forestry legislation is the outdated forestry code of 1975.

The logging bans have not helped conservation in the mostly open-access forest lands nor have they helped to develop stable wood and fibre supplies (Guiang 2001). The ban has directly affected CBFM participants who rely on limited timber harvesting in the absence of alternative livelihood sources. Protection and regeneration of the forests and forest lands (five million ha under different community tenure instruments – DAI 1999) has been handed over to communities with CBFM adopted as the national strategy, yet they have very insecure rights over the trees they grow and little production and marketing support. The marginalisation of economic aspects reduces the incentives for communities and the private sector to grow trees and deprives upland communities of a key livelihood opportunity. Forestry's long gestation periods make it particularly sensitive to policy instability.

However in turn the forestry profession including the Government needs to demonstrate good governance and how sustainable forest management should work on the ground. Abuses continue and fuel public perceptions that hurt well-intentioned private actors and communities. Individual violations of regulations sometimes lead to all forestry actors having their activities suspended or cancelled.

5.3.2 Fruits and other non-timber crops, and ecotourism

Fruit trees and other non-timber crops were important rehabilitation elements in 30 projects (Figure 9). They were especially important in LGU and PO projects, and in Region VII to meet the needs of its highly forest-dependent population. Two private sector projects grew bamboo for poles and furniture in Regions III and XI. There were roughly 18 species planted, the most common being mango, lanzones (*Lansium domesticum*), jackfruit (*Artocarpus heterophyllus*), bamboo (*Bambusa blumeana*), coffee (*Coffea Arabica*), durian (*Durio zibethinus*), rambutan (*Nephelium lappaceum*), rattan (*Calamus merrillii*), kakawate (*Gliricidia sepium*), rubber (*Hevea brasiliensis*) and abaca (*Musa textiles*) (Annex 4b). Rattan was used for furniture, kakawate as driftwood for orchids, abaca for decoration and fibre production, and neem (*Azadirachta indica*) for mosquito repellent, the last two in Region VII. The Fibre Industry Development Authority promoted abaca production through inter-planting in rehabilitation projects, providing income while communities waited for the timber trees to mature for harvesting.

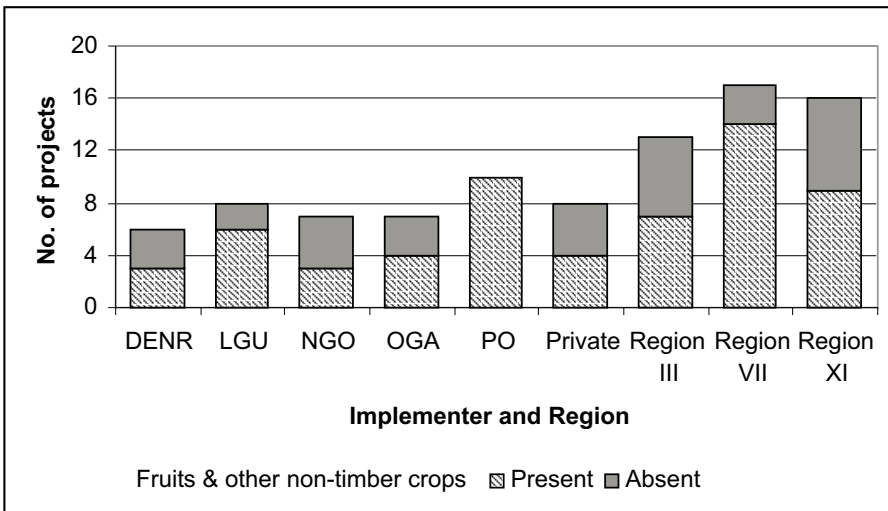


Figure 9. Sample projects with fruit trees and other non-timber crops by implementer group and region

Only the case studies asked specific questions about the production and marketing of fruits and other non-timber crops. In some cases, the plantations were not yet in production. The available information is summarised below:

- Five projects (DENR Osmeña, NGO San Agustin, PO Elcadefe, LGU MTP and OGA PNOC) mentioned good results with fruit production and good markets, particularly for mangoes. Communities benefited and the income helped protect the rehabilitated sites in the LGU and OGA sites.



Durian fruit trees on a reforestation site. (Photo by Takeshi Toma)

- Four PO projects expected to harvest and market the fruits in a few years but faced problems with survival and growth, including lack of species-site matching for species such as mango and coffee. These projects had few maintenance activities.
- Bamboo has been harvested on three-year rotations since 1998 in Osmeña, but IFMA 311 found marketing plantation bamboo difficult because it could not compete with informal natural forest extraction of bamboo and government support was inadequate.
- International demand was good for *Sinamay*¹⁶ fibre production from abaca plantations.

Communities organised into a cooperative in an LGU project had not yet received any income from ecotourism. The cooperative now wished to negotiate with the large resorts nearby for a share of the benefits. An NGO project reported benefits from ecotourism activities. Two sites (SIFMA and PO) planned to benefit from ecotourism in the future.

¹⁶ Fine hand-woven natural fibre made from abaca plant. Very popular for natural gift packaging and wrapping, accents to floral designs, angel wings and skirts among other products.

5.4 Socio-economic outcomes

5.4.1 Livelihoods

Of the 30 projects that sought to increase local income and provide employment or livelihood opportunities, information on longer-term outcomes was available for 23 (Table 11). Seven projects without explicit income objectives also had information on these aspects. The information came from interviews with managers, project documents and case studies.

Table 11. Change in local community cash income from pre-project to present time on sample projects

Change in community cash income from pre-project to present time and reasons why	DENR	LGU	NGO	OGA	PO	Private	Total
Projects with income objectives							
No effect on long-term cash income — short-term employment only (&/or livelihood schemes not viable yet or project terminated)	3	1	1	2	4*	1	12
Improved income due to livelihood schemes &/or employment			3	1	5		9
Improved income due to timber harvests						1	1
Improved income due to contour farming					1		1
Projects without responses but potential long-term benefits		3*		1*			4
No information (1 private project - too early)						3	3
Total	3	4	4	4	10	5	30
Projects without income objectives							
No effect on long-term cash income — short-term employment only (&/or livelihood/production schemes not viable yet)	2	2 (1*)	1*			1	6
Income declined because trees replaced agricultural crops		1*					1
No information (1 private project - small area)	1	1	2	3		2	9
Total	3	4	3	3		3	16

* Projects with planned local livelihood/production schemes that could still benefit communities in the longer-term

Twelve of the 30 projects with information (five of them DENR projects) provided only short-term employment and income to local communities. Another seven OGA, DENR and private sector projects planned to provide only short-

term employment but no information was available about the actual outcomes. One NGO made no provision for local communities. Most of these 20 projects were located on government land or leased lands with local claims, but were not participatory, particularly in benefit and cost-sharing decisions. Pressure from local communities was heavily degrading the forests in thirteen of these sites.

The projects with favourable (11 sites) or potentially favourable (11) long-term local income outcomes were mainly PO (all), NGO (4/7) and LGU (5/8) projects, plus two OGA projects.

- These projects had provided for agroforestry, timber production or other livelihood schemes and incentives to communities. Timber and other products had not yet matured to contribute to local income on most of these sites, and outcomes in this regard remained to be seen.
- These projects were more participatory with communities or individual farmers resident in the area directly involved in decision-making and implementation.
- There were no unresolved conflicts on these sites and degradation pressures were low on 20 of the 22 sites.
- Community organising and assistance activities were undertaken on 18 of these sites and community representatives, project staff and evaluation documents indicated positive outcomes such as improved technical, financial and management capacity, and development of links to external agencies on 15 sites. However, continued support and assistance were needed on many sites to ensure successful production and flow of economic benefits. Community organising without paying attention to production and economic aspects runs the risk of creating dissatisfied social groups and rebel movements.
- Most potentially favourable projects were executed on areas where communities had secure tenure through CBFM agreements, or resident communities or farmers had independent contracts that allowed them to benefit directly from the products generated (fruits and other products in most sites and timber in some). However secure land tenure does not guarantee secure tenure over the resources on the land because frequent policy changes have affected the community or farmers' rights to harvest timber, despite their having approved plans and fulfilling their responsibilities.

In 12 mainly government, private sector and NGO project sites, trees were planted not only on barren lands but also on areas cultivated by local people (Figure 7). In nine other sample sites (mainly PO and NGO projects), communities could continue to cultivate sections of the land. Income declined in the short term in three LGU/NGO projects (Piwardep, Small Watershed and Ihan) because trees replaced agricultural crops but in four other areas where such replacement occurred, the projects appear to be viewed positively for their future benefits.



(Top left) PO meeting in Elcadefe CBFM site. (Top right) PO timber production. (Bottom left) PO members at work in Saug watershed. (Bottom right) DENR assisting Dalesan PO in rehabilitation activity. (Source: National Forestation Development Office, DENR)

Non-cash income stayed the same or increased in five (Small Watershed, Elcadefe, PNOC, San Agustin and SRMCI) of 12 case study sites because people had rights to and were using the agroforestry or forestry products regenerated by the projects (Table 12, see Annex 1 for details on case studies). However, non-cash income also increased in four less-participatory cases (WMECP, Family Contract, Davao ESP and Alsons) because people had returned to gathering timber and other forest products. Non-cash income declined in two cases, Piwardep and Ihan, because communities were deprived of agricultural products when their cultivated land was converted to tree plantations.

In three cases (Elcadefe, PNOC and San Agustin) food security improved because of project-related factors: including inter-cropping and agroforestry options. The rehabilitation projects did not directly affect health, utilities, luxury goods or housing. Most cases had improved access to finance, skills and training, and information due to both project-related and external factors. External factors included increased credit availability, and access to schools and road networks. PNOC, San Agustin and Piwardep showed improvements across many livelihood indicators. Improvements in PNOC and San Agustin were directly related to project activities, while external factors were more important in Piwardep.

Table 12. Change in 12 livelihood indicators from pre-project to present in 12 case study sites

No.	Livelihood indicators	Change from pre-project to present)*			Managers' perspective vs. community's if different**
		Increased	No change	Decreased	
1	Cash income	2	9	1	WMECP – increase vs. no change
2	Savings	2	10		San Agustin – decrease vs. no change
3	Non-cash income	6	4	2	San Agustin – no change vs. increase
4	Food security	6	3	3	WMECP – increase vs. decrease; Piwardep – decrease vs. increase
5	Health	2	7	2	WMECP – increase vs. decrease; Piwardep – no change vs. increase; San Agustin – increase vs. no change
6	Housing	6	5		
7	Utilities	6	5		WMECP – increase vs. no change; San Agustin – increase vs. no change
8	Luxury goods	10	1		
9	Access to finance	9	3		Piwardep – no change vs. increase
10	Skills/training	7	3		WMECP – increase vs. no change
11	Access to information	10	1	1	WMECP – increase vs. decrease; Piwardep – no change vs. increase

* Information from the communities on all but two private sector cases – Alsons and Davao ESP

** Different perspectives only available on four cases for livelihood indicators – WMECP, PNOC, Piwardep, San Agustin

Stakeholders had distinct perspectives on livelihood outcomes in three of the four cases where both project staff and communities were surveyed. Only PNOC was rated positively overall by both groups. In the WMECP case, which was terminated due to conflicts over harvesting policy, the OGA project staff were more positive than the community regarding indicators such as cash income, food security, health, utilities, access to education, training and information. In San Agustin, the community viewed the project as more successful than the NGO project staff regarding changes in savings, non-cash income, health and utilities. In Piwardep, the community was more positive than the project staff regarding changes in food security, health, access to finance and information. In this last

case, the LGU project staff only took into account the project area, whereas the communities had migrated to the towns and considered those areas as well.

The findings of this study are in line with those of FMB-FAO (2003) for CBFM in general: They found that income increased at the start due to labour required for planting and additional income is expected when different forest and agroforestry products are harvested or when other livelihood schemes show results. Borlagdan *et al.* (2001) report that harvesting rights and local on-site processing created jobs and generated revenues in many early community forestry sites (1980s to 1990s). In many instances, development and tree planting projects increased productivity on upland farms. But in general, effects on household income varied on their 29 sampled sites. In many instances, labour, opportunity, farm development, protection and transport costs to communities were higher than the benefits.

Borlagdan *et al.* (2001) and Hartanto and Evangelista (2002) insist resource management and other schemes must provide increased income and livelihoods to sustain CBFM. They note that rigid regulatory requirements prevent viable and effective management and income generation. For example, the DENR determines annual allowable cuts and cutting area, requires 100 percent inventory, and approves resource use applications and transport permits. According to DAI (1999), only 98 out of more than 4000 CBFM communities have approved resource management plans.

5.4.2 Technical assistance and community empowerment

Most (17) of the 21 projects with community support and empowerment objectives and activities were foreign assisted, except for one PO (KMYLB), one LGU and two private sector projects. Recent foreign-assisted programs usually required community involvement and participatory approaches. Activities ranged from formal community organising to registration as legal entities; assistance and training in technical, marketing, livelihood, management, book keeping and financial matters; preparing proposals and financial work plans; networking with donors and external agencies; and monitoring and evaluation.

Farmers and communities achieved some empowerment on most project sites, according to project managers, evaluation documents and the communities in four case studies (Figure 10). PO staff provided their views on empowerment in eight PO sites. Community and project staff perceptions were similar in the four sites where both groups were surveyed. All the sites with community empowerment objectives and support activities by the DENR, NGOs and LGUs have managed to maintain their plantations. However, they encountered some problems including limited technical assistance, termination of funds and support, poor PO leadership, poor capacity of assisting organisations, and organising being conducted too fast and failing to bring about cohesion.

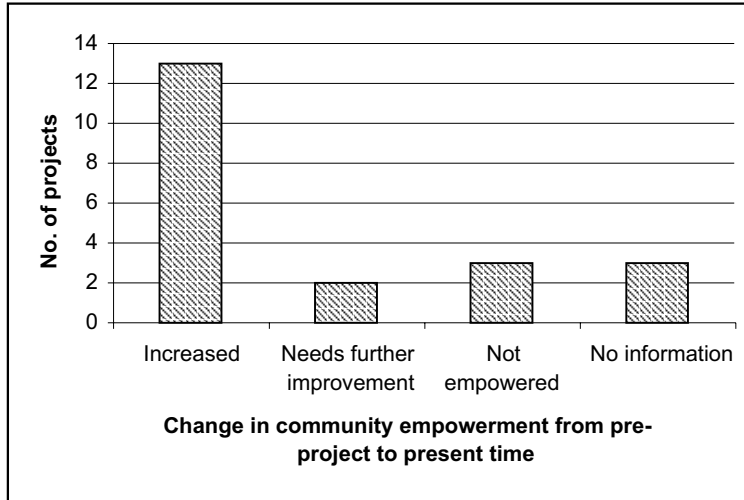


Figure 10. Change in community empowerment from pre-project to present time on sample projects

Borlagdan *et al.* (2001) point out that technical assistance and training are a key incentive for adopting CBFM. As in our study, they found that community organisations, morale, participation and links to outside agencies and ideas were strengthened in many cases. They also noted that assisting organisations' capacity is often very low and community empowerment will take long-term sustained effort by the LGU and the DENR (Borlagdan *et al.* 2001, Hartanto and Evangelista 2002). One problem is that when the project ends so does support. The DENR lacks funds to provide continued support.

5.4.3 Tenure security

Of the nine project sites that sought to improve tenure clarity and security on public forest lands, eight obtained secure and clear CBFM, IFMA and SIFMA contracts (See Annex 3 for details on the different agreements). Secure tenure was pending on the OGA UDP site inhabited by indigenous people, where "Free Prior Informed Consent"¹⁷ from the National Commission for Indigenous People was needed before a CBFM agreement could be issued.

At present:

- Nine PO sites have clear CBFM agreements securing communities' tenure over the forest land for specified purposes.

¹⁷ The Philippine Indigenous Peoples Rights Act recognises the right of free prior informed consent of indigenous people for all activities affecting their lands and territories.

- Two *contract reforestation* areas (DENR and PO), one LGU and one NGO project still have secure Certificates of Stewardship Contract from the former Integrated Social Forestry project.
- The private sector sites had clear and secure IFMA (five sites) or SIFMA (two sites) agreements for using public forest lands.
- The remaining 24 sites were direct government-owned timberland, reservations or protected areas, many with local land claims. Tax declarations¹⁸ and land claimants were recognised in 19 projects along with former FLMA and CSC on three OGA, four LGU, two NGO, three PO, four private and two DENR projects. People were allowed to continue farming, or were involved in decision making in one LGU project, prioritised for hire in one private sector project, or their land bought out in one OGA project (Mananga). Tenure security for local communities was low on these sites.
- A Protected Area Community Based Resources Management Agreement (PACBRAMA) had been issued on part of the Osmeña project site.

Seventeen instances of land tenure conflict were encountered across project types. Most were resolved through amicable settlement, meetings, dialogues and facilitation. Labour payments were made on two sites and people were paid to leave another site. Disputes on six sites remained unresolved. There were conflicts between people and government, people and people, people and PO or Cooperative, PO or people and absentee claimants, DENR and Department of Agrarian Reform, and DENR and Metro Cebu Water District. In the last case, the DENR disputes the district's sale of land, which is not permitted under the NIPAS law¹⁹. Tenure was the main conflict source on the project sites, followed by encroachment and illegal resource use.

5.4.4. Gender

Four of the nine projects that sought to enhance gender equity (mainly PO and NGO projects) had information on outcomes. The projects made attempts to equitably include women and provide them with opportunities. This resulted in increased participation and benefits for women in Banika project, and high representation at meetings and thus influence over decision-making in the San Agustin and Samabaco projects. In Dalesan project, only a few women were involved despite overtures.

¹⁸ LGUs may accept tax declarations from claimants, thus recognising that claimants have developed the forestry land to some extent. This is one way that farmers gain some security over the land they till and occupy. The LGUs collect taxes on lands irrespective of whether they are private or public. Technically, such tax declarations are not allowed on public forest lands, but the DENR is unable to control this phenomenon.

¹⁹ National Integrated Protected Areas System (NIPAS) Act of 1992.

5.5 Long-term management plans and status

All PO and private sector initiatives, except for the community *contract reforestation* project PISFFAI, had long-term management, monitoring and evaluation plans. The Government demands long-term (25-year) comprehensive resource management plans for IFMA, SIFMA and CBFM agreement areas (Guiang 2001), with regular monitoring and evaluation by the DENR. The official project period has drawn to an end for the JBIC-funded PO projects and it remains uncertain if the area will continue to be managed over the long-term.

Only three of the seven OGA projects had long-term management plans. Two of these involved POs with CBFM agreements. Two of the seven NGO projects had some sort of plan for 10 or 25 years, with one other project, Kalinan, planning a Memorandum of Agreement with the DENR for long-term management. Of the eight LGU projects, three had long-term plans and farmers were supposed to be protect and maintain two project sites with some LGU assistance. But farmers in the Small Watershed project felt there were no individual plans for their respective areas, and they had lost their farming income with conversion to plantations. Most DENR projects covered in this study had no long-term management and monitoring plans to show because they were implemented a long time ago (Osmeña in 1916) or were regular reforestation projects from the 1970s and 1980s with funding terminated in 1990. Guiang (2001) confirms our findings that most forest lands under government administration without long-term community or private sector tenure arrangements have no effective and operational long-term management plans and maintenance, and depend on ad-hoc funding.

Long-term management seems closely linked to having a plan in the first place. A simple statistical test of the relation between having a plan and long-term maintenance of the trees showed that it was positive and significant ($\chi^2_{1, <0.001} = 13.74$). Of the 25 projects with plans, 22 had continued high maintenance and protection activities. Of the 21 without plans, only nine had continued high maintenance.

5.6 Financial viability

ADB loan I, DENR and many OGA-funded projects proved not to be financially viable in the long-term. They had little or no long-term support and funds were stopped after the establishment phase.

More recent foreign-assisted and private sector projects planned for reinvestment through income generation from timber and non-timber products and/or livelihood schemes, but these plans often ran into trouble due to production and marketing problems and/or livelihood schemes not being viable. Thirteen

projects were doing poorly, either because their funding stopped (nine DENR, OGA and ADB loan I) or their reinvestment plans failed (three private, one OGA). Of these, 10 had already lost a substantial proportion of their plantations to human pressures and fire, and two *contract reforestation* projects were just surviving. Eleven projects (mainly DENR and PO) were struggling along with limited government funding, reinvestment plans that were yet to prove viable or submitting proposals for funding.

Seven mainly non-government projects (three PO, two NGO, one private, one LGU) were doing well financially, with ongoing reinvestment from income earned, funds attracted from other sources, or further investments not needed. Another 12 projects were potentially viable in the long term, having reinvestment plans (two LGU and three private, one PO) or where farmers could harvest the products and maintain the areas (six LGU, NGO and OGA). Outcomes from the planned production, livelihood and reinvestment schemes remain to be seen. Projects with better financial status also tended to be better maintained and protected.

Even though many externally-funded projects failed to sustain their efforts over the long term and future viability of projects just completed is not really assured, the Philippine Government and JBIC are negotiating for another large loan of P6.027 billion to rehabilitate 86,000 ha of denuded forest land (<http://www.denr.gov.ph/article/view/3477>). If the projects prove unproductive and unviable in the long run and continue to depend on large external loans, the Philippines risks further indebtedness with little to show for it. Past loans still have to be paid back and funds for rehabilitation loan repayments will have to come from outside the forestry sector. Esteban (2003) also expresses concern about lack of funds and overdependence on donors, along with ensuring that commercial reforestation efforts are viable.

5.7 Outcomes and sustainability across multiple criteria

Projects were rated based on two primary considerations: “percent target area planted and area remaining intact at present”, and “community organising, livelihood schemes and long-term viability” in more community-oriented projects. Based on these criteria, the project managers rated roughly 12 projects as unsuccessful (≤ 6 on a scale of 1-10, 10 being the most successful) (Table 13). Of the 12 projects, five were rated 8-10 soon after the project but the respondents rated them less successful over the long term. Community ratings were additionally available on six non-PO case studies and were similar to the project managers’ ratings, except that managers rated PNOC, San Agustin and Family contract slightly lower than the communities did.

Table 13. Success ratings of sample projects over the longer term or at present time by project managers on a scale of 1-10 (≤ 6 failure, 7 satisfactory, 8-10 good)

Project implementer categories	Success ratings					Total no. of projects sampled
	<3	4-6	7	8-10	No response	
DENR	2		1	3		6
LGU	1	1	1	4	1	8
NGO		1		5	1	7
OGA	1	2	2	2		7
PO		2	2	5	1	10
Private		2	1	4	1	8
Total	4	8	7	23	4	46

We also looked at production and marketing and long-term financial and management aspects to assess overall sustainability. These aspects and socio-economic considerations such as pressures on the forest resources, unresolved conflicts, institutional arrangements, local participation, benefits provided to communities and livelihood outcomes tend to influence the long term maintenance of the rehabilitated areas. Tenure security and funding source were less important.

Four dominant clusters of sample projects from the 40 included were evident from the nonlinear principal components analysis taking into account 13 variables related to physical accomplishments, socio-economic, production and marketing, institutional, financial and management aspects (See Table 7 for variables and categories in each). Category coordinates for all variables and the sample project scores are plotted on two-dimensional ordination diagrams (Figures 11 and 12). The analysis explained a large amount of the variation in the data, as is evident from the large decline in the eigenvalues (0.47 to 0.16) from the first to second dimension. Dimension I explained a substantial amount of the variance and was related to the ordinal variables: financial viability, long-term management plans, plantations maintained in the long term, degrading pressures, timber production prospects and outcomes, and local participation. Categories of the nominal variables of funding sources, planned socio-economic incentives and institutional arrangements were scattered over Dimensions I and II with different categories strongly related to Dimensions I or II.

Looking across the multiple criteria:

- Ten community-based projects in Cluster II (Figure 12) fared the best, doing well on the socio-economic side and having promising long-term management and sustainability prospects. Plantations tended to be maintained in the long-term, degrading pressures were low, local participation in decision-making was high, and livelihood outcomes were positive. Communities had contracts

with the DENR ensuring secure tenure over the land and setting out rights and responsibilities. Planned socio-economic incentives included timber, non-timber products and livelihood schemes. However, these projects are relatively recent, most are foreign funded and it remains to be seen whether they will be sustainable in the long-term once their funding ends. Much depends on whether their income generation, production and reinvestment strategies bear fruit. They probably need continued support in these aspects.

- Farmer-assisted projects²⁰ (Cluster I) were also doing relatively well and differed from the PO projects mainly in the lack of secure land tenure, having less well-established long-term financial and management plans, and often only having access to non-timber products and livelihood schemes. Local participation in decision-making was high and livelihood outcomes were positive. Projects were mostly funded by foreign grants since the 1990s and have so far been maintained with little pressure on forests and no unresolved conflicts.
- Private sector (Cluster III) and pure government projects including FSP I (Cluster IV) where communities had little role performed poorly on socio-economic aspects. They only provided employment or non-timber benefits to local communities. Many of these types of government projects and a few private sector projects faced high degrading pressures, unresolved conflicts and found it difficult to maintain their plantations in the long term. Projects that fared badly did badly across the board, in physical accomplishments, socio-economic outcomes, production and marketing, long-term management and financial viability.

The private sector was better off than the pure government projects in terms of timber production plans, prospects for long-term financial viability and ability to maintain and protect their plantations. However, the private sector operates on lands claimed by farmers and how they manage their social relations will influence long-term outcomes. How their timber production plans and reinvestment strategies work out also remain to be seen.

At the current time, market prospects seem generally poor and support for production and marketing on projects of all sectors is limited. Any change in the external environment in terms of policy and marketing support may substantially influence long-term outcomes.

²⁰ Projects where farmers were assisted to rehabilitate the lands they occupied and benefit from timber or non-timber products and livelihood schemes.

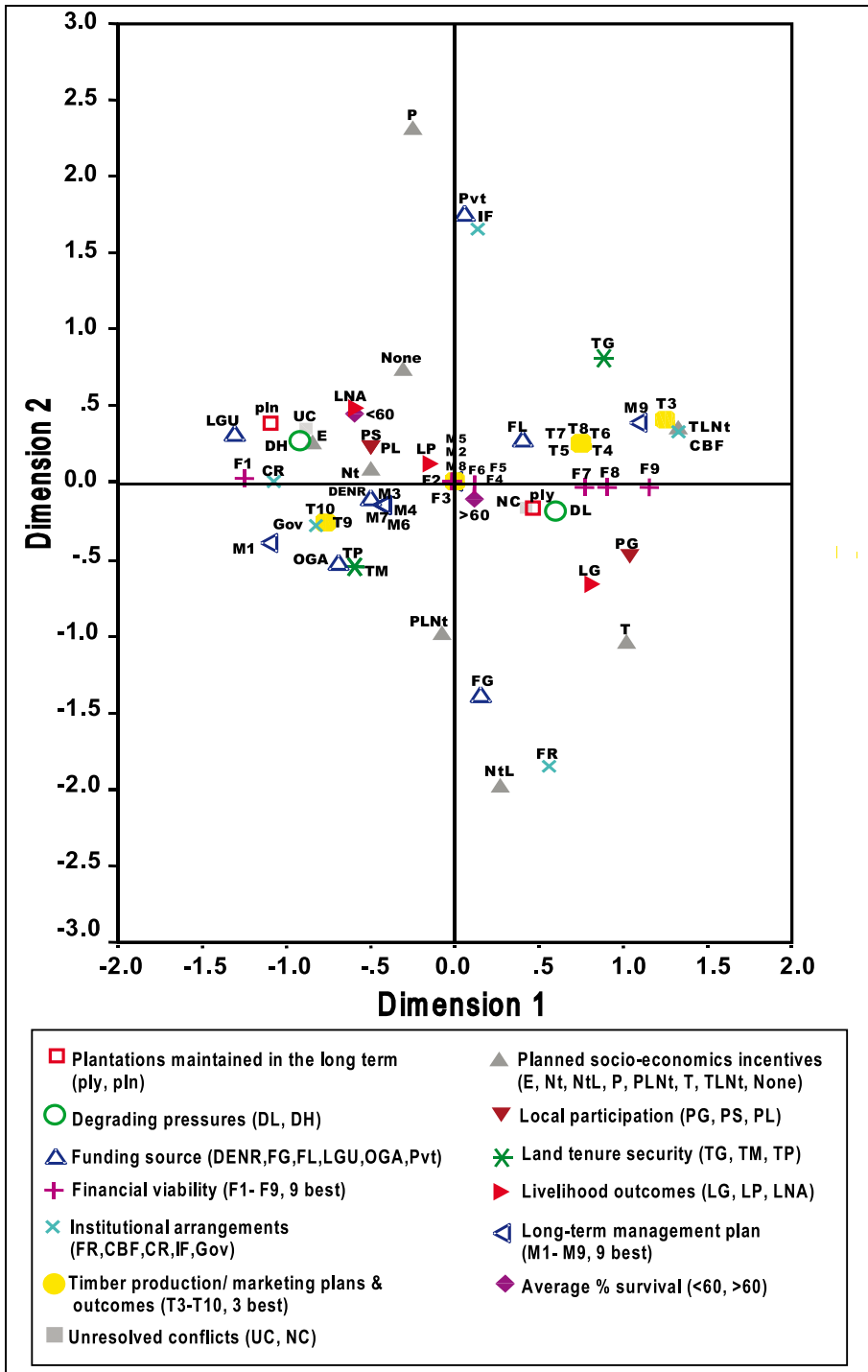


Figure 11. Plot of category coordinates for the different variables as generated by the Nonlinear Principal Components Analysis. Codes for each variable are described in Table 7

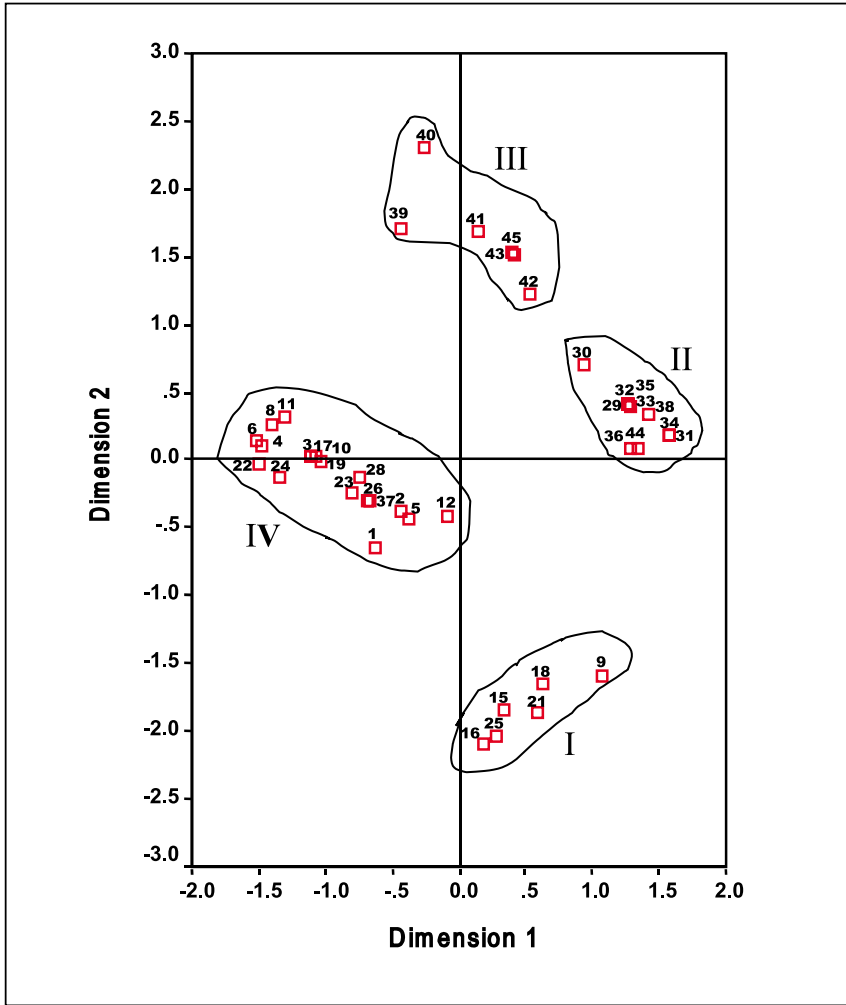


Figure 12. Plot of sample project scores as generated by the Nonlinear Principal Components Analysis, and delineation of project clusters I, II, III and IV. Projects are labelled by Project ID as in Annex 1

5.8 Region

The three regions differed little except that fuelwood, fruits and NTFPs were more important in Regions III and VII than in Region XI. The latter had more forest (see Chapter IV). Region VII had better market prospects for timber and other forest products. This is probably because of its strategic location, low forest cover and large forest-dependent population (see Chapter IV). Region XI projects in particular felt a lack of support from government and other agencies for marketing rehabilitation-related products. Kummer *et al.* (1994) and Walters *et al.* (2005) also indicate that a shortage of wood and good markets can lead to successful tree planting as in Cebu island, Bais Bay, and Manacan island.

6. Summary and lessons learnt

Many actors were involved in implementing rehabilitation initiatives under various institutional arrangements ranging from pure government, NGO and private sector projects to more participatory community or farmer-assisted models. Communities or resident farmers actively participated in only a third to half the initiatives assessed despite being the targeted beneficiaries on 89 percent. Most DENR, OGA and private sector initiatives aimed to provide mainly employment benefits to communities while LGU, NGO and PO initiatives (particularly the last) sought to offer a mix of benefits including livelihood schemes, agroforestry, fuelwood, timber and NTFP production. PO and NGO projects were mostly foreign-funded, while DENR, OGA and private sector projects were self-funded. Foreign-assisted and private sector initiatives tended to have high costs per ha, while pure government projects had more limited funding.

A high percentage of the initiatives did reasonably well in getting the plantations established and maintaining them in the immediate post-project period. However, their long-term sustainability is uncertain and depends on the enabling factors listed in the “*lessons*” below. Ultimately, whether established plantations will remain will largely depend on whether the rehabilitation efforts and/or any other allied initiatives address the livelihood needs of forest-dependent communities. This remains to be seen on roughly 25 percent of the initiatives sampled pending outcomes from forest production and rehabilitation activities, while a large number (roughly half) appear to be doing poorly on socio-economic aspects. Forest production, income generation and financial viability therefore appear to be key to sustaining rehabilitation efforts, but all sectors (and government projects in particular) did poorly on production and marketing despite stated production goals. Only 16 percent of the projects are financially viable at present, with a further 28 percent depending on future income generation and forest production outcomes. The remaining projects have either terminated with no funding and long-term management, or are struggling along with minimal, ad hoc funding. Across multiple criteria (technical, socio-economic, financial, management, production and marketing), farmer and community-participatory models appeared to be doing best compared to pure government, NGO or private sector initiatives but future sustainability remains to be seen.

The initiatives, particularly the ones with biodiversity objectives, appear to be contributing modestly to enhancing biodiversity through planting numerous species per site including some native species, and allowing natural regeneration in the understorey. Contribution to watershed functions is unclear in the absence of technical monitoring. Lessons learnt on the factors (approaches and incentives) contributing to positive outcomes and sustainability are presented below:

6.1 Physical accomplishments and long-term maintenance

1. Accomplishing planting targets is generally not a problem given adequately funded projects and availability of local labour for hire. The challenge lies in ensuring short and long-term survival of the planted areas which involves paying attention to technical and socio-economic issues. Government-led projects in particular need to improve on ensuring survival of the rehabilitated areas in the short and long term.
2. Species-site matching is vital to ensure good survival and growth. The government, academe and even private agencies could provide technical guidance through extension services and materials to project managers, and make more available quality planting material of appropriate species.
3. Planting many species in mixed stands or in mosaics could reduce pest and disease problems. Nair (2001) indicates that large monoculture plantations are most susceptible to pest outbreaks, and susceptibility is not exclusively determined by the exotic or indigenous nature of the tree species.
4. Almost all forest lands in the Philippines suffer degradation due to high demand for wood, fuelwood, grazing and *kaingin* cultivation. Continued management and protection and reduced degrading human pressures are the most important factors for maintaining rehabilitated areas in the long term. These factors are closely linked to having a) long-term management plans and protection measures in place, b) stable long-term funding or financial viability, and c) local community participation and stake in the projects.

6.2 Environmental aspects

1. Technical evaluations of project impacts on soil and water properties are needed, particularly given that a) this objective drives many projects, b) observations of impacts vary widely and c) perceived links between forests and large-scale flooding and landslides drive forestry policies in the Philippines.
2. Rehabilitation activities should be designed, techniques and species chosen, and the area managed according to the specific watershed and soil conservation objectives. Plans must be site-specific.
3. Philippines' forest rehabilitation efforts have a high potential to contribute to biodiversity enhancement while meeting production and livelihood needs through a) continuing to plant many species, including native species, and retaining and allowing natural regeneration; and b) protecting the rehabilitated areas from over-logging, over-hunting and other unplanned human activities. Lamb *et al.* (2005) advocate establishing mixed species and native species plantations rather than traditional large-scale monocultures to provide both goods and ecological services. Mixed plantations could contribute to biodiversity, while also providing production gains, reducing pest damage and protecting against uncertain markets. However, marketing support for the species planted is crucial.

6.3 Production and marketing

1. Long-term social and political support for the production functions of forests needs to be generated and secured to ensure successful rehabilitation and sustainable management of forest lands. This is important to meet industrial and household demand, generate income for impoverished upland communities, and provide environmental services in the process. Pure conservation projects have little chance of success. The private and government sectors will have to demonstrate good practices and governance to gain civil society's trust and support.
2. Clear and consistent policies, dissemination and implementation are required for management and harvesting in forest lands with different types of legal status, tenure and institutional arrangements, such as watersheds, protected areas, CBFM agreement areas, and IFMA and SIFMA areas. Such policies should be framed following a well-facilitated information exchange and negotiation process with stakeholders, and legislated to reduce vulnerability to political changes. Individual violators of regulations should be subject to suspensions and not all forestry actors en masse.
3. The Government and other agencies need to provide marketing support for timber and other products generated by farmers, communities and the private sector to make viable and sustain the efforts and investment in rehabilitation and forestry. This is particularly so for Region XI and perhaps some lessons can be learned from Region VII which is doing better in market prospects and marketing support. FMB-FAO (2003) note that markets for products such as furniture have barely been tapped. Community-based market information systems, selecting species based on markets too, incentives to processing firms to obtain wood from rehabilitated areas, forming marketing associations, adding value, improving roads and transport, and certification have been suggested as means to improve marketing (Austria 1995, Hartanto *et al.* 2002, Calderon and Nawir 2004).
4. Viable production and marketing strategies are needed, along with plans and follow-through to implementation for all rehabilitation projects with timber production objectives. If the DENR and OGAs cannot be sure of sustained follow-through due to unstable funding or political support, production forestry may be better left to other sectors of society. Communities need support to develop good strategies and plans and see it all the way through to marketing, but the DENR does not have sufficient resources to support the projects in the long term. Private sector-community partnerships may be one mechanism, however FMB-FAO (2003) mention that the CBFM policy tends to discriminate against (rather than enable meaningful) collaboration of communities with private enterprises.
5. Production costs need to be assessed and adequate incentives provided to promote viable commercial forestry and interest from different sectors. Overall,

a well-defined comprehensive effort is required along with an agency to take the lead to make commercial forestry and rehabilitation efforts viable for the different sectors.

6. Bureaucratic requirements for approval of resource use plans and provision of harvesting permits need to be simplified to ensure that project managers can respond effectively to the market opportunities.
7. Fruits and other non-timber crops are less subject to the policy instability and disincentives faced by timber plantation establishment and production. Their incorporation into rehabilitation projects by POs, government agencies or NGOs in timberland and protection forest areas could provide an important long-term source of income for upland communities while maintaining tree cover. Communities would need assistance with technical and marketing aspects.

6.4 Socio-economic aspects

1. Before the project, almost all sites had degradation problems due to logging, fuelwood collection, grazing and *kaingin* cultivation, and this is the case in most upland areas in the Philippines. It is therefore important to address these causes of degradation and ensure positive socio-economic outcomes on all projects to ensure their long-term sustainability, or else the degrading pressures will continue as was found in many sample projects. The new forestry sector project seeking to sustain rehabilitation by moving communities out is unlikely to meet its objectives given that land is limited and communities have few options.
2. Both short and long-term income-generating options are needed for the communities to have a stake in rehabilitating and managing the areas. Providing only short-term benefits results in wasted effort because people return to their former livelihood activities afterwards. A combination of employment opportunities, livelihood schemes and long-term benefits from sale of agroforestry and timber products looks promising.
3. Community empowerment and capacity building is a must to help communities manage their areas and funds, harvest and market the products, and ensure that livelihood and reinvestment schemes are viable. It may take a long time before communities can manage by themselves and therefore continued long-term assistance is essential with an appropriate financing mechanism. The process cannot be rushed and it needs to be highly participatory right from the start to build true cohesion. Experienced community organisers tend to be more effective. Hartanto *et al.* (2002) recommend collective action, learning and information exchange to manage community forests and monitor markets based on successful trials in Palawan.
4. Tenure security both over the land and its resources will go a long way towards ensuring long-term management interest and investment of effort by

the farmers and communities. Harvesting rights on different lands need to be clarified and made consistent and legislated to buffer communities from frequent political changes.

5. It is not possible or equitable to lock out the impoverished communities inhabiting and using these uplands. DENR, OGA and private sector projects in particular need to recognise community claims and use negotiation and partnership agreements to ensure communities have a stake in the project's long-term sustainability. Clear long-term institutional arrangements and having local people participate in decision-making (including in benefit and cost-sharing) are critical. On projects mainly for environmental purposes, allowing for fruit and other non-timber products as well as livelihood schemes could encourage community support. Garforth and Mayers (2005) emphasise similar aspects in their review of how plantations could help poor people.
6. Ground evaluations are needed of the impacts of planned and completed rehabilitation projects on communities given that a) many projects have livelihood improvement as an objective; b) sustaining livelihoods is key to sustaining the rehabilitated areas; and c) approaches need to be tailored to derive positive impacts.

6.5 Management plans and financial viability

1. Long-term management plans and institutional arrangements need to be developed to effectively maintain and protect the rehabilitated areas, particularly for open-access, government-administered areas.
2. Stable long-term funding is required for continued maintenance, protection and sustainability of rehabilitation efforts. It is better not to rely entirely on short-term and/or unstable government and foreign funding, though it is good as start-up money for site development and social organising. The projects should have long-term income generation and reinvestment plans from the forest products generated or from the livelihood schemes. This is true for both protection and production areas, though the kind of production may be more restricted in the former.
3. Income generation and reinvestment plans must be made to work for government, community and private sector projects through sustained long-term support for production and marketing and livelihood schemes. Lack of financial viability will cause investors to move to other, more profitable sectors, leading to less investment in forests both for production and environmental services.

6.6 Outcomes and sustainability across multiple criteria

1. Long-term sustainability requires attention to all aspects of rehabilitation: technical, socio-economic, financial, management, production and marketing aspects.

2. The community or farmer-based participatory rehabilitation models appear promising in terms of plantation maintenance and socio-economic outcomes to date. But long-term sustainability will depend on how well the income generation, production and reinvestment strategies work out. These projects need strong production and marketing support in a stable and enabling policy environment.
3. The private sector model with minimal local participation is doing moderately well and depends substantially on continued maintenance and protection to sustain the efforts. Poor market prospects, potential lack of financial viability and social problems threaten many of these projects. The private sector needs to work on the socio-economic aspects while also obtaining strong production and marketing support to ensure long-term financial viability. A stable enabling policy environment is vital in this model too.
4. The pure government sector model with limited attention to local people and production functions of forests is the weakest and prone to failure. It depends purely on limited unstable government or external funding and faces high risks of termination followed by forest degradation. Such government-initiated projects need to work on all aspects (socio-economic, production, financial and management) to ensure long-term sustainability of their rehabilitation efforts and positive outcomes. It is best if government-initiated projects are restricted to strict conservation and protection areas where other sectors cannot play a larger role. Even in such situations, attention needs to be paid to local community needs with appropriate incentives provided, as well as tapping into stable funding sources for long-term management and protection. Perhaps communities could play an effective role in protection functions, too, given appropriate incentives.

6.7 Regions

1. The enabling environment for successful rehabilitation may be better in Regions VII and III compared with Region XI, given a greater demand for the products and possibly better support from the government and other agencies. Available wood products from natural forests in Region XI reduce incentives for plantation establishment. The needs and prospects could be built on for favourable outcomes, and more effort will have to be put into Region XI to support rehabilitation projects and their outputs.

7. References

- Acosta, R.T. 2002. Impact of incentives on the development of forest plantation resources in the Philippines. Presented at the Asia Pacific Forestry Commission meeting in Ulan Bator, Mongolia, August 2002.

- Armas, A. Jr. and D.J. Cryde. 1984. Economic evaluation of the Philippine Alcogas and Cocodiesel Programs. *PIDS Monograph Series* No. 3. Philippine Institute for Development Studies, Makati city, Philippines.
- Austria, I. 1995. Developing a community-based marketing information system for integrated social forestry products: the Philippines experience. *Unasylva* 183 (46): 45-50.
- Baggayan, R Jr.L. 1996. Performance analysis of contract reforestation Cebu Province: Silviculture and Social Perspectives. PhD thesis, University of Philippines Los Baños.
- Borlagdan, S.B., E.S. Guiang and J.M. Pulhin. 2001. Community-based forest management in the Philippines: A preliminary assessment. Institute of Philippine Culture, Ateneo de Manila University, Philippines.
- Calderon, M. and A.A. Nawir. 2004. An evaluation of the feasibility and benefits of forest partnerships to develop tree plantations: Case studies in the Philippines. Center for International Forestry Research, Bogor, Indonesia and the University of Philippines Los Baños.
- Cossalter, C. and C. Pye-Smith. 2003. Fast-wood forestry: Myth and realities. Forest Perspectives. Center for International Forestry Research, Bogor, Indonesia.
- Department of Environment and Natural Resources (DENR) and Japan International Cooperation Agency (JICA). 1987. Technical report on afforestation. RP-Japan Forestry Development Project of the Pantabangan Area, Nueva Ecija.
- Development Alternatives, Inc. (DAI). 1999. Contract completion report: Community-based forest management at a crossroads: The future of sustainable forest management in the Philippines. Development Alternatives, Inc., Quezon City, Philippines.
- Durand, P.Y. and O. Monteuis. 1995. Forestry in the Philippines; Priority to reforestation. *Bois et Forêts des Tropiques* 246: 79-80.
- Durst, P.B., C. Brown, H.D. Tacio and M. Ishikawa. 2005. In search of excellence: Exemplary forest management in Asia and the Pacific. RAP Publication 2005/02. Food and Agriculture Organisation and Regional Community Forestry Training Center for Asia and the Pacific, Bangkok, Thailand.
- Esteban, I. 2003. Appended forest plantation report. In *Revised Philippine Master Plan for Forestry Development*. Forest Management Bureau, Quezon City, Philippines.
- FAO and CIFOR. 2005. Forests and floods - Drowning in fiction or thriving on facts. RAP Publication 2005/03. Forest Perspectives 2. Center for International Forestry Research, Bogor, Indonesia and Food and Agriculture Organisation, Bangkok, Thailand.

- FDC. 2005. Evaluation of typhoon (in November and December 2004) damages in Infanta and Real, Quezon and Dingalan, Aurora. Terminal Report. Forestry Development Center, College of Forestry and Natural Resources, University of the Philippines Los Baños.
- Forest Management Bureau (FMB). 2004. 2003 Forest Cover Statistics. A draft report on the Joint Project of Forest Management Bureau and National Mapping and Resources Inventory Administration on Forest Cover Statistics. Forest Management Bureau, Department of Environment and Natural Resources, Quezon City, Philippines.
- Forest Management Bureau (FMB) – Food and Agriculture Organisation (FAO). 2003. Revised Philippine Master Plan for Forestry Development. Department of Environment and Natural Resources, Quezon City, Philippines.
- Garforth, M. and J. Mayers. 2005. Plantations, privatisation, poverty and power: Changing ownership and management of state forest. Earthscan, London.
- Gayo, J.R.C. 2000. Problems, issues and constraints in the implementation of the Philippine Forestry Master Plan: Perspective of the smallholder tree farmers. Presented at the *First Forestry Forum on the Philippine Master Plan for Forest Development*, ADB Auditorium, ADB Avenue, Mandaluyong City, 17-18 February 2000. Forest Management Bureau of the Department of Environment and Natural Resources, Quezon City, Philippines.
- Guiang, E.S. 2001. Impacts and effectiveness of logging bans in natural forests: Philippines. In *Forest out of bounds: impacts and effectiveness of logging bans in natural forests in Asia-Pacific*, eds. C. Brown, P.D. Durst and T. Enters, pp 103-135. Food and Agriculture Organisation, Bangkok, Thailand.
- Hartanto, H. and E. Remedios. 2002. Workshop proceedings: Building partnerships, strengthening capacities and developing forest resources through community-based forest management, Oasis Hotel, Clarkfield, Angeles City, Philippines, 6-7 August 2002. Forest Management Bureau, Department of Environment and Natural Resources, Philippines and Center for International Forestry Research, Bogor, Indonesia.
- Hartanto, H., M.C.B. Lorenzo and A.L. Frio. 2002. Collective action and learning in developing a local monitoring system. *International Forestry Review* 4 (3): 184-195.
- Kramer, M.A. 1991. Nonlinear Principal Components Analysis using autoassociative neural networks. *AIChE Journal* 37 (2): 233-243.
- Kroonenberg, P.M, B.D Harch, K.E. Basford and A. Cruickshank. 1997. Combined Analysis of Categorical and Numerical Descriptors of Australian Groundnut Accessions Using Nonlinear Principal Component Analysis. *Journal of Agricultural, Biological and Environmental Statistics* 2 (3): 294-312.
- Kummer, D., R. Concepcion and B. Canizares. 1994. Environmental degradation in the uplands of Cebu. In *The Geographical Review*, pp 266-276. The American Geographical Society, New York, USA.

- Lamb, D., P. D. Erskine and J.A. Parrotta. 2005. Restoration of degraded tropical forest landscapes. *Science* 310: 1628-1632.
- Nair, K.S.S. 2001. Pest outbreaks in tropical forest plantations: Is there a greater risk for exotic tree species? Center for International Forestry Research, Bogor, Indonesia.
- Sayer, J., U. Chokkalingam and J. Poulsen. 2004. The restoration of forest biodiversity and ecological values. *Forest Ecology and Management* 201: 3-11.
- Shimamoto, M., F. Ubukata and Y. Seki. 2004. Forest Sustainability and the free trade of forest products: Cases from Southeast Asia. *Ecological Economics* 50: 23-34.
- Sidle, R.C., A.D. Ziegler, J.N. Negishi, A.R. Nik, R. Siew and F. Turkelboom. 2006. Erosion processes in steep terrain – Truths, myths, and uncertainties related to forest management in Southeast Asia. *Forest Ecology and Management* 224: 199-225.
- Soriaga, R. 2006. Fostering watershed governance in Visayas, Philippines. In *European Tropical Forest Research Network News: Forest, water and livelihoods*, pp 53-56. European Tropical Forest Research Network, Wageningen, The Netherlands.
- SPSS Inc. 1999. SPSS Categories 9.0. SPSS Inc., Chicago, USA.
- van Noordwijk, M. 2006. Editorial. In *European Tropical Forest Research Network News: Forest, water and livelihoods*, pp 3-5. European Tropical Forest Research Network, Wageningen, The Netherlands.
- Walpole, P. 2006. Forest and flashfloods. In *European Tropical Forest Research Network News: Forest, water and livelihoods*, pp 14-16. European Tropical Forest Research Network, Wageningen, The Netherlands.
- Walters, B.B., C. Sabogal, L.K. Snook and E. de Almeida. 2005. Constraint and opportunities for better silvicultural practice in tropical forestry: an interdisciplinary approach. *Forest Ecology and Management* 209: 3-18.

Annex 1. List of sample projects

ID	Region	Key Implementer	Project name	Abbreviation	Location	Funding source	Period
1	3	DENR	ASEAN New Zealand Afforestation Project	ANZAP	Brgys. 1 Bigbiga, Sula, Burgos and Maamot; San Jose and Mayantok municipalities; Tarlac	Foreign grant	1980-87
2	3	DENR	Calao Quick Forest	Calao	Sitio Calao, Brgy. San Jose, Mayantok, Tarlac	DENR	1979-03
3	3	DENR	* Contract Reforestation Project by Family	Family Contract	Brgy. Villarica, Pantabangan municipality, Nueva Ecija	Foreign loan	1989-91
4	11	DENR	Davao Seed Orchard Reforestation Project	DVSO	Brgys. Balagunan, Bobongan, Magwawa, San Jose and Mamacao; Sto. Thomas and Kapalong municipalities; Davao del Norte	DENR	1976-90
5	7	DENR	* Osmeña Reforestation Project	Osmeña	Camp 7, Minglanilla, Cebu	DENR	1916-present
6	11	DENR	Pasian Reforestation Project	Pasian	Pasian, Monkayo, Compostela Valley	DENR	1975-89
7	7	LGU	Community Based Resource Management Project	CBRMP	14 brgys. Bagtik, Cananghan, Libaong, Sabana, San Remegio, Cebu	Foreign grant	2001-04
8	7	LGU	Community-Based Contract Reforestation Project	CBCR	Maglimao and Cabatuanan, Basay, Negros Oriental	Foreign loan	1988-92

¹ Brgy. - barangay. The smallest political unit in the Philippines and often corresponds to a village or town district.

ID	Region	Key Implementer	Project name	Abbreviation	Location	Funding source	Period
9	3	LGU	Community-Based Tree Farming Project	CBTF	Bazal and Diat, Ma. Aurora, Aurora	Foreign grant	1996-99
10	3	LGU	Contract Reforestation Project by LGU	LGU Contract	Bagac, Bataan	Foreign loan	1989-94
11	3	LGU	Municipal Tree Park	MTP	Brgy. General Luna, Carranglan, Nueva Ecija	LGU	1982-98
12	7	LGU (Forestry-based Multipurpose Cooperative in Pilar)	*Pilar Watershed Rehabilitation and Development Project	Piwardep	Brgy. Ilaud, Pilar, Bohol	OGA	1997-01
13	11	LGU	Plant Now/ Pay Later and High Value Crops Disappear Program	PNPL	Laak, Compostela Valley	LGU	2000-present
14	11	LGU	*Small Watershed Rehabilitation Project	Small Watershed	Panas, Carion, New Corella, Davao del Norte	LGU	2000-present
15	7	NGO (Ting Matiao Foundation TMF)	Banika River Watershed Development Project II	Banika	Apolong, Sagbang, Valencia, Negros Oriental	Foreign grant	1994-97
16	7	NGO (Mag-Ugmad Foundation Inc.)	Cebu Soil and Water Conservation Project	Cebu soil	Brgy. Tabayag, Argao, Cebu	Foreign grant	1981-94
17	3	NGO (Green Makers Development Foundation, Inc.)	Contract Reforestation Project – by NGO	NGO Contract	Brgy. Pag-asa, Bambar, Tarlac	Foreign loan	1988-93
18	11	NGO (Kiblawan Rural Development Foundation Inc. KRDFI)	*Ihan Reforestation Project	Ihan	Ihan, Kiblawan, Davao del Sur	Foreign grant	1996-98
19	11	NGO (Kalinao Socio-Ecological Development Organisation KASEDO)	Japanese – Philippines Volunteer Foundation Project	Kalinao	West Marahan, Marilog, Davao City	Foreign grant	1991-96

ID	Region	Key Implementer	Project name	Abbreviation	Location	Funding source	Period
20	11	NGO (Movement for a clean and green mountain forest Inc.)	Rehabilitation of 46 km Buda Road	MAMI	Bukidnon and Davao Provinces	OGA	2003-03
21	7	NGO (Soil & Watershed Conservation Foundation Inc. SWCFI)	* San Agustin Integrated Agroforestry and Livestock Project	San Agustin	San Agustin and Bugsoc, Sierra Bullones, Bohol	Foreign grant	1995-98
22	3	OGA (Tarlac College of Agriculture)	Dendrothermal Project	Dendro	Sitio Calao, San Jose, Mayantoc, Tarlac	OGA	1982-89
23	7	OGA (Metro Cebu Water District)	Mananga Watershed Rehabilitation Program	Mananga	Brgys. Sudlon, Sinsin and Butao; Cebu City	OGA	1999-present
24	3	OGA (National Power Corporation)	Pantabangan Watershed Area Team Reforestation Project	Pantabangan	Burgos, Caranglan, Nueva Ecija	OGA	2002-04
25	7	OGA (Philippine National Oil Company)	* PNOC-EDC Southern Negros Geothermal Project	PNOC	Lunga, Valencia, Negros Oriental	OGA	1992-present
26	11	OGA (National Power Corporation)	Talomo Watershed Riverbank Stabilisation	Talomo	Talomo, Davao city	OGA	1994-present
27	11	OGA (Department of Agriculture)	Upland Development Program	UDP	Pitu, Malalag, Davao del Sur	Foreign grant	2000-05
28	3	OGA (National Irrigation Administration)	* Watershed Management and Erosion Control Project	WMIECP	Pantabangan and Magat, Nueva Ecija	Foreign loan	1980-89
29	7	PO (El Nansa Agroforestry Developers Association, Inc.)	Boljoon Reforestation Project	Boljoon	Boljoon, Cebu	Foreign loan	1995-98
30	3	PO (San Roque Community Management Centre Inc. SRMCI)	* Cadmang Watershed Rehabilitation Project	SRMCI	Brgy. Cadmang, Cabangan, Zamboales	Foreign loan	1997-99

ID	Region	Key Implementer	Project name	Abbreviation	Location	Funding source	Period
31	11	PO (San Isidro-Mambing-Bayabas Multi-Purpose Coop.)	CBFM - SAMABACO	Samabaco	Nabunturan, New Corella, Montevista, Davao del Norte	Foreign loan	1997-03
32	11	PO (Dalaguete Lebanon San Vicente Montevista Watershed Multi-purpose Coop.)	Dalesan Montevista Watershed Multipurpose Coop	Dalesan	Vicente Montevista, Compostela Valley	Foreign loan	1997-03
33	11	PO (El Salvador, Cabidanan, Del Monte and Santa Fe CBFM Planters Association Inc.[ELCADEFE])	* ELCADEFE CBFM Planters Association, Inc.	Elcadeffe	Brgys. El Salvador, Cabidanan, Del Monte and Santa Fe; New Corella municipality, Davao del Norte	Foreign loan	1997-03
34	3	PO (People's Organisation for Environment Development Incorporation [POEDAI])	JBIC Balog-Balog Watershed Project	Balog	Brgy. Maamot, San Jose, Tarlac	Foreign loan	1998-03
35	7	PO (Sicopong United Ecological Rehabilitators for Sustainable Development Association Inc. [SUERSDAII])	JBIC Sicopong Watershed Sub Project	Sicopong	Sab-ahan, Bais City, Negros Oriental	Foreign loan	1997-03
36	7	PO (KMYLB) Kapunungan sa mga Maguuma sa Yutang Lasangnon sa Bulalacao	KMYLB Agroforestry Development Corp.	KMYLB	Bulalacao, Nug-as, Alcoz, Cebu	DENR	1985-present
37	7	PO (PISFFAI) Palaypay Integrated Social Forestry Farmers' Association, Inc	PISFFAI Contract Reforestation Project	PISFFAI	Sab-ahan, Palaypay, Bais City, Negros Oriental	Foreign loan	1989-98

ID	Region	Key Implementer	Project name	Abbreviation	Location	Funding source	Period
38	7	PO (Tabogon Ecological Resource Management Association Inc. Termai)	Maintenance and Protection Enhancement Program - DENR Loan II	Termai	Kal-anan, Tabogon, Cebu	Foreign loan	1997-99
39	11	Private company (Alcantara & Sons)	* Alcantara and Sons IFMA	Alsons	Brgys. Misolong and Sto. Nino, Talaingod municipality, Davao del Norte	Private	1993-2018
40	11	Private Company (Davao ESP)	* Davao ESP Resource, Inc. IFMA	Davao ESP	Magsaysay, Marilog, Davao City	Private	1992-2017
41	7	Private Company (Manguerra Mining and Development Corporation)	Manguerra Mining and Development Corporation IFMA	Manguerra	Brgys. Atabay, Ginang and Danang Lungsod; Alcoy; Cebu	Private	1984-94
42	7	Private individual	* IFMA No.205	IFMA 205	Sitio Pamari, Brgy. Tayawan, Bayawan, Negros Oriental	Foreign loan	1991-2016
43	3	Private individual	IFMA No. 311	IFMA 311	Sitio Ganlang, Brgy. Talbak, Doña Remedios Trinidad, Bulacan	Private	1992-2017
44	11	Private originally, now PO (San Roque Multi-Purpose Cooperative)	San Roque MPC	SRMPC	San Roque, Nabunturan, Compostela Valley	Foreign loan	1990-present
45	11	Private individual	SIFMA	SIFMA	Bagong Silang, Bayanihan, Marilog, Davao City	Private	1990-2015
46	7	Private company (FARLIS)	SIFMA of FARLIS	Farlis	Brgys. Gaas and Duangan, Balamban municipality, Cebu	Private	2000-05

* case studies

Annex 2. Participants of focus group discussions and interviews for database II in 13 case studies

Case	Focus Group Discussion	Additional interviews	Perspectives
Region 3			
1. San Roque Community Management Centre Inc. (SRMCI)	<ul style="list-style-type: none"> • 14 representatives from PO SRMCI <ul style="list-style-type: none"> - 1 Chairman - 1 Board of Trustee member - 12 SRMCI members • 4 SRMCI non-members • 1 DENR staff 	Two PO members and a PO non-member	The PO was the project manager, so only community perspectives
2. Watershed Management and Erosion Control Project (WMECP)	<ul style="list-style-type: none"> • 5 project beneficiaries (served as labourers during project implementation) • 8 project staff (from OGA National Irrigation Administration) 	One OGA project staff	OGA staff and community perspectives separated out in group discussion
3. Contract Reforestation Project – Family Approach (Family Contract)	<ul style="list-style-type: none"> • 5 project contractors • 7 DENR personnel/staff 	Two contractors	DENR staff and community perspectives separated out in group discussion
Region 7			
4. San Agustin Integrated Agroforestry and Livestock Project (San Agustin)	<ul style="list-style-type: none"> • 5 community representatives • 1 NGO staff (from Soil & Watershed Conservation Foundation Inc. SWCFI) 	NGO project manager	NGO manager and community perspectives
5. PNOC-EDC Southern Negros Geothermal Project (PNOC)	<ul style="list-style-type: none"> • 14 representatives from the Lunga Farmer's Association (LUFA) <ul style="list-style-type: none"> - Vice-President - 13 members • 2 representatives from OGA Philippine National Oil Company (PNOC) 	OGA project manager	Project manager's and community perspectives

Case	Focus Group Discussion	Additional interviews	Perspectives
6. Pilar Watershed Rehabilitation and Development Project (Piwardep)	<ul style="list-style-type: none"> • 15 representatives from the Piwardep LGU cooperative- Vice Mayor - Municipal Councillor - 2 Board of Directors - Coop Chairman - 10 coop members (LGU staff) • 3 local co-operators/contractors 	One LGU project staff, one contractor, and the <i>barangay</i> chairman at time project establishment	LGU project staff and contractor perspectives
7. Osmeña Reforestation Project (Osmeña)	<ul style="list-style-type: none"> • 10 representatives from 3 POs – MALTAJ, CAMMITA, and Camp 7 NTPMPC - 2 Board of Directors - 1 Chairperson - 1 Vice-Chairperson - 6 members • 2 representatives from DENR 	Three community members	DENR staff not interviewed separately, so only community perspectives
8. IFMA No.205		IFMA holder	Only project manager's perspective
Region 11			
9. Small Watershed Rehabilitation Project (Small Watershed)	<ul style="list-style-type: none"> • 4 farmers' cooperative members • 1 DENR staff 	LGU staff	LGU staff and community perspectives
10. Ihan Reforestation Project (Ihan)	<ul style="list-style-type: none"> • 5 from farmers' group • 1 NGO staff (from Kiblawan Rural Development Foundation Inc. KRDFI) 		Only community perspective
11. Alcantara and Sons IFMA (Alsons)		Company staff	Only project manager's perspective
12. Davao ESP Resource, Inc. IFMA (Davao ESP)		Company owner and staff	Only project manager's perspective
13. ELCADFE CBFM Planters Association, Inc. (Elcadeffe)		Two PO members	The PO was the project manager, so only community perspective available

Annex 3. Tenure agreements issued on public forest lands

Tenure Instrument	Duration of Lease/ Agreement/ Contract	Description	Basic Issuances	Beneficiaries
<p>CBFMA</p> <p>Community-Based Forest Management Agreement</p>	<p>25 yrs, renewable for another 25 yrs</p>	<p>A production sharing agreement entered into between a community and the government, to develop, utilise, manage and conserve a specific portion of forest land, consistent with the principles of sustainable development and pursuant to a community resource management framework.</p>	<p>EO 263-1995: Adopting CBFM strategy to ensure the sustainable development of the country's forestland resources and providing mechanisms for its implementation</p> <hr/> <p>DAO 96-29: R & R for the implementation of EO 263 otherwise known as CBFMS</p>	<p>Peoples organisations, community associations</p>
<p>CSC</p> <p>Certificate of Stewardship Contract in conjunction with Integrated Social Forestry Program (ISF)</p>	<p>25 yrs, renewable for another 25 yrs</p>	<p>Refers to a contract entered into by and between an individual forest occupant or forest community association or cooperative and the Government allowing the former the right to peacefully occupy, cultivate and enjoy all income/proceeds derived from a designated area. The size of farms approved for the CSC is 3-7 ha.</p> <p>Grantees are to develop their allocated land into productive farms consistent with sound ecological practices, and devote at least 20% of the land to tree farming for ecological stability.</p>	<p>LOI 1260, MNR Order 82-48: Integrated Social Forestry Program and regulations and guidelines for implementation.</p>	<p>Individuals or families actually occupying or tilling portions of forest lands prior to 1 January 1982. Includes upland community associations</p>

Tenure Instrument	Duration of Lease/ Agreement/ Contract	Description	Basic Issuances	Beneficiaries
IFMA I Industrial Forest Management Agreement	25 yrs, renewable for another 25 yrs	<p>IFMA is an agreement entered into by DENR and a qualified person, to occupy and possess, in consideration of a specified rental, any forest land of the public domain in order to establish an industrial forest plantation.</p> <p>The minimum area for IFP is 100 hectares and the maximum area shall be the area that can be developed within five (5) years by the lessee but not to exceed 20,000 hectares, with some exceptions. Only open and denuded areas shall be granted.</p>	<p>DAO 91-42: Revised regulations and guidelines governing the development of Industrial Forest Plantations (IFPs)</p>	<p>Filipino citizen; corporations, partnerships or associations or cooperatives registered under Philippine laws; TLA holders in good standing who are willing to convert their TLA to IFMA; and community organisations whose members reside near or adjacent to the lands applied for.</p>
IFMA II Industrial Forest Management Agreement II	25 yrs, renewable for another 25 yrs	<p>A production sharing agreement entered into between the DENR and a qualified applicant which grants to the latter the right to develop, utilise and manage a specified area (including natural forest) consistent with the principles of sustainable development and in accordance with a Comprehensive Development and Management Plan, under which both parties share in its produce.</p>	<p>DAO 97-04: Rules and regulations governing the Industrial Forest Management Program</p>	<p>Private individuals/ single family 1-10 ha; associations or corporations 11-500 ha.</p>
SIFMA Socialised Industrial Forest Management Agreement	25 yrs, renewable for another 25 yrs	<p>SIFMA refers to an agreement entered into by and between a natural or judicial person and the DENR wherein the latter grants to the former the right to develop, utilise and manage a small tract of forest land, consistent with the principle of sustainable development. Only open and denuded areas shall be granted.</p> <p>As an incentive for the participation of qualified tree planters, they shall be granted the privilege to benefit from their crops which shall consist primarily of trees for wood production, non-timber species and other cash crops that may be inter-planted.</p>	<p>DAO 96-24: Rules and regulations governing the Socialised Industrial Forest Management Program</p>	

Tenure Instrument	Duration of Lease/ Agreement/ Contract	Description	Basic Issuances	Beneficiaries
<p>FLMA</p> <p>Forestland Management Agreement</p>	<p>25 yrs, renewable for another 25 yrs</p>	<p>A contract between the DENR and a forest land manager granting the sole and exclusive right to occupy, develop, manage, harvest, sell and utilise products grown from the land with corresponding obligation to repay the financial assistance provided by the DENR to help develop the land.</p> <p>Grants of 100 ha or more.</p>	<p>DENR MC 20, 1992: Implementing guidelines for the awarding, monitoring and evaluation of community organising contracts for Forest Land Management Agreement</p> <p>DAO 23-1993: Forest Land Management Program</p>	<p>Individuals, organisations and former reforestation contractors who were involved in the reforestation efforts of the government</p>
<p>PACBRAMA</p> <p>Protected Area Community Based Resource Management Agreement</p>	<p>25 yrs, renewable for another 25 yrs</p>	<p>An agreement entered into by and between the DENR and the organised tenured migrant communities or interested indigenous people in protected areas and buffer zones.</p> <p>PACBRMA shall be the tenure instrument issued to POs in all NIPAS sites, additional and initial components. It shall provide tenure security and incentives to develop, utilise, manage, conserve and protect these areas pursuant to the approved Community Resource Management Plan (DAO 2004-32).</p>	<p>RA No. 7586, NIPAS Act of 1992</p> <p>DENR Admin. Order No. 25, Series of 1992 (Implementing rules & regulations of NIPAS Act)</p> <p>EO 263 adopting CBFM as the national strategy for the sustainable development of the country's forestland resources and providing mechanisms for its implementation</p> <p>DAO 2002-02: Guidelines on the establishing and managing community-based programs in protected areas</p>	<p>Organised tenured migrant communities and indigenous people</p>

Annex 4a. Timber species planted on sample project sites

Latin name	Common/local name	N/E*	Purpose	Implementer group								Region		
				DENR	LGU	NGO	OGA	PO	Private	Total	III	VII	XI	
<i>Swietenia macrophylla</i>	mahogany	E	Timber, posts & poles	4	5	7	6	10	5	37	10	15	12	
<i>Gmelina arborea</i>	Gmelina, yemane	E	Timber, fuelwood	6	6	6	3	8	4	33	10	12	11	
<i>Acacia mangium</i>	mangium	E	Timber, fuelwood	2	2	3	2	4	6	19	6	8	5	
<i>Pterocarpus indicus</i>	narra	N	Quality timber – furniture	4	1	4	4	4	0	17	7	6	4	
<i>Acacia auriculiformis</i>	Acacia	E	Timber, fuelwood	1	1	1	3	2	1	9	3	5	1	
<i>Eucalyptus spp.</i>	<i>Eucalyptus</i>	E	Timber	3	0	0	1	2	3	9	6	3	0	
<i>Eucalyptus deglupta</i>	bagras	E	Timber/Poles	0	1	1	0	3	3	8	0	2	6	
<i>Leucaena leucocephala</i>	ipil-ipil	E	Charcoal, fuelwood, leaf meal, posts & poles	2	1	1	2	0	2	8	4	1	3	
<i>Tectona grandis</i>	teak	E	Quality timber – furniture	5	0	1	0	0	2	8	3	2	3	
<i>Paraserianthes falcata</i>	falcata, moluccansau	E	Timber, charcoal	1	0	0	0	3	3	7	0	0	7	
<i>Casuarina equisetifolia</i>	agoho	N	Timber	2	1	0	0	2	1	6	3	3	0	
<i>Vitex parviflora</i>	molave	N	Quality timber	1	1	2	1	1	0	6	1	3	2	
<i>Samanea saman</i>	rain tree	N	Timber	0	1	0	1	1	0	3	1	2	0	
<i>Araucaria columnaris</i>	<i>Araucaria</i>	N	Timber	0	0	1	0	0	1	2	0	0	2	
<i>Acacia confusa</i>	ayangile	N	Timber	0	0	0	1	0	1	2	0	2	0	
<i>Pinus insularis</i>	benguet pine	N	Timber/latex	1	0	0	0	0	1	2	0	1	1	
<i>Delonix regia</i>	fire tree	N	Boundary marker/Timber	1	0	0	1	0	0	2	0	1	1	
<i>Intsia bijuga</i>	ipil	N	Timber	1	0	0	1	0	0	2	1	1	0	
	robles	E	Woodcraft	0	1	0	0	0	1	2	0	2	0	

Latin name	Common/local name	N/E*	Purpose	Implementer group						Total	Region		
				DENR	LGU	NGO	OGA	PO	Private		III	VII	XI
<i>Melanolepis multiglandulosa</i>	alim	N	Woodcraft	0	0	0	0	0	0	1	0	1	0
<i>Reutealis trisperma</i>	baguilumbang	N	Timber	1	0	0	0	0	0	1	0	1	0
<i>Lagerstroemia speciosa</i>	banaba	N	Medicine/ timber	0	0	1	0	0	0	1	0	0	1
<i>Antidesma ghaesembilla</i>	binayoyo	N	Timber	0	0	0	0	0	1	1	0	0	1
<i>Macaranga tanarius</i>	binunga	N	Timber	0	0	1	0	0	0	1	0	0	1
<i>Dracontomelon dao</i>	dao	N	Timber	0	0	1	0	0	0	1	0	0	1
<i>Toona calantas</i>	kalantas	N	Timber	0	0	0	1	0	0	1	0	1	0
<i>Shorea spp.</i>	lauan (red or white)	N	Quality timber	0	0	1	0	0	0	1	0	0	1
<i>Aleurites moluccana</i>	lumbang	N	Timber	1	0	0	0	0	0	1	0	1	0
	native species	N		0	0	0	1	0	0	1	0	0	1
	others	N		0	0	1	0	0	0	1	0	0	1
	pinus	E	Timber/ latex	1	0	0	0	0	0	1	1	0	0
	red cedar	E	Timber	0	0	0	0	0	1	1	0	0	1
<i>Cedrela odorata</i>	Spanish cedar	E	Timber	0	0	1	0	0	0	1	0	0	1
<i>Shorea contorta</i>	white lauan	N	Quality timber	1	0	0	0	0	0	1	0	1	0
	yanti	N		0	0	1	0	0	0	1	0	0	1
<i>Acacia spp.</i>		E	Timber	0	0	1	0	0	0	1	1	0	0
<i>Acacia siamea & Acacia diversifolia</i>	Timber/ charcoal	E		0	0	1	0	0	0	1	0	1	0

* N/E: Native/ Exotic species

Annex 4b. Fruit and other non-timber species planted on sample project sites

Latin name	Common/local name	N/E	Purpose	Implementer groups						Total	Region		
				DENR	LGU	NGO	OGA	PO	Private		III	VII	XI
<i>Mangifera indica</i>	mango	E	Fruits	1	2	1	2	6	1	13	6	4	3
<i>Lansium domesticum</i>	lanzones	N	Fruits	0	2	1	2	4	0	9	0	4	5
<i>Artocarpus heterophyllus</i>	jackfruit, nangka	N	Fruits	0	0	2	2	3	0	7	0	7	0
<i>Coffea arabica</i>	coffee	E	Coffee beans	0	0	0	1	5	0	6	0	3	3
<i>Durio zibethinus</i>	durian	N	Fruits	0	2	0	1	3	0	6	0	0	6
<i>Nephelium lappaceum</i>	rambutan	E	Fruits	0	1	1	1	3	0	6	0	1	5
<i>Gliricidia sepium</i>	madre de cacao, kakawate	E	Fruits, driftwood for orchids	1	0	1	0	1	1	4	2	2	0
<i>Hevea brasiliensis</i>	rubber	E	Latex	0	0	0	0	3	0	3	0	0	3
	fruit trees	E		1	0	0	0	0	2	3	0	0	3
<i>Persea gratissima</i>	avocado	E	Fruits	0	0	1	0	0	0	1	0	1	0
<i>Citrofortunella microcarpa</i>	calamansi	N	Fruits	0	0	0	1	0	0	1	1	0	0
<i>Anacardium occidentale</i>	cashew	E	Fruits	0	0	0	1	0	0	1	1	0	0
<i>Manilkara sapota</i>	chico	E	Fruits	0	0	1	0	0	0	1	0	1	0
<i>Sandoricum koetjape</i>	santol	N	Fruits	0	0	1	0	0	0	1	0	1	0
<i>Cocos nucifera</i>	coconut	N	Fruits, timber	0	0	0	0	1	0	1	0	1	0
<i>Calamus merrillii</i>	rattan "palasan"	N	Furniture	0	0	1	1	3	0	5	1	4	0
<i>Bambusa blumeana</i>	bamboo	N	Furniture, posts & poles	1	0	1	1	2	2	7	3	2	2
<i>Azadirachta indica</i>	neem	E	Mosquito repellent	1	1	0	0	0	0	2	0	2	0
<i>Musa textiles</i>	abaca	N	Sinamay for decoration, fibres	0	0	1	1	1	0	3	0	3	0