

**PHILIPPINE PEÑABLANCA
SUSTAINABLE REFORESTATION PROJECT
(PPSRP)**



Project Design Document
for
**Climate, Community & Biodiversity Standards
Second Edition**

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Prepared by

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Project Overview

Background

The Philippines is one of world's seventeen megadiversity countries.¹ At the same time, it is one of the world's most threatened biodiversity hotspots. This is made manifest by the less than 3% remaining primary forest cover. The remnants of the primary forests, surrounded by fragmented forests, form the watershed that provides clean and potable water to the major towns and cities. Majority of these watersheds are currently in states of degradation characterized by accelerated soil erosion, erratic stream flow, depleted ground water resources, biodiversity loss, changing microclimate and declining land productivity.

The Sierra Madre Mountain range in the northern island of Luzon constitutes the largest block of remaining natural rainforest in the Philippines—about 1.4 million hectares, accounting for 25% of the country's forests, including more than 400,000 hectares or 40% of the remaining oldgrowth forests. The biodiversity significance of this region is exemplified by its high wildlife diversity. About 3500 species of plants have been recorded in the area, of which 58% are found nowhere else in the world. There are at least 293 species of birds, 84 of which are endemic to the country, and 19 of which are threatened. Because of its high biodiversity, the Sierra Madre mountain range has been identified as one of the conservation priority areas in the Philippines.

The region is also known as the top producer of rice and corn in the country. However, the limited livelihood opportunity has forced the marginalized community to resort to unsustainable use of forest lands and its resources. This has resulted in the fragmentation of the forest that threatens the endemic and threatened species of plants and animals and the integrity of the watersheds that may be further compounded by the unpredictable impacts of climate change. Even in protected areas, threats to the unique biodiversity and the natural forest of PPLS remain unabated.

To reverse the negative trends, Conservation International (CI) has initiated conservation projects within the Peñablanca Protected Landscape and Seascape (PPLS), a protected area located at the heart of Sierra Madre Mountains, in partnership with local NGOs, the Department of Environment and Natural Resources (DENR) and the Local Government Unit of Peñablanca (LGU). The project's goal is to uplift the community's human well being and aims to reduce their dependence on the unsustainable use of their natural resources. Activities included conservation awareness campaign, assisting the local communities in the formulation of their respective Barangay Development Plans, facilitating the implementation of livelihood-related projects of partner NGOs, promoting sustainable upland farming through material and technical support in the establishment of agroforestry farms of selected individual farmers, strengthening the management capacity of the PPLS managing authority (the Protected Area Management Board and the Protected Area Superintendent Office) through cross visits to other protected areas and preparation of the PPLS Management Plan made consistent with the regional and local development plans.

¹ R. A. Mittermeier, P. Robles Gil & C. G. Mittermeier. (Eds.), *Megadiversity: Earth's Biologically Wealthiest Nations*. Monterrey, Mexico: CEMEX. 501p.

The Project

The donation from the Toyota Motor Corporation (TMC) provided an opportunity to expand this initiative started by local stakeholders in 2007. The TMC, DENR, LUG, and CI concluded a grant agreement with the witness of President Arroyo, and the Philippine Peñablanca Sustainable Reforestation Project was officially launched in September 2007. The goal of the project is to promote forest restoration, forest and biodiversity conservation, and alternative livelihood through reforestation, enhancement planting and agro-forestry. The project will cover 2,943 hectares of degraded lands (formerly grazed grassland and patches of degraded secondary forest) in five barangays² within PPLS, of which 2500 hectares will receive active intervention of either reforestation, enhancement planting, or agroforestry. The project will be implemented in two phases (Phase 1 from 2007 to 2010; Phase 2 from 2010 to 2013). For the long-term sustainability of the benefits the project impacts after the initial funding ends, the project will create Reforestation Fund.

The Project Activities

The activities and targets under the Reforestation (912 ha in phase 1 / 418ha in phase 2), Enhancement Planting (300ha / 170ha) and the Agroforestry (560ha / 140ha) components cover the whole range of operations from nursery establishment and seedling production to planting and maintaining the seedlings, which include fire prevention. Restored forests will provide improved ecosystem services, while agroforestry will provide an income source alternative to incomes from unsustainable use of forest patches (e.g., logging for charcoal to sell).

Fuelwood collection from forests has been identified as one of the major sources of deforestation in the area. Thus, the Avoided Deforestation component promotes an alternative cooking scheme that does not use forest-based fuel, as well as planting fuelwood trees in designated areas, to reduce, if not totally stop, the cutting of trees from the natural forest.

In addition, the project will assist in the creation and development of Reforestation Fund as a sustainable financing mechanism to expand the reforestation activities to cover other barangays after the project ends and to serve the micro-financing and emergency funding needs of the project participants. The Forest Protection and Awareness Campaign component focused on the multi-sectoral patrolling activities and information and education activities about the project and its conservation values.

The Philippine Peñablanca Sustainable Reforestation Project aims to bring multiple benefits to the community and to the environment. To ensure that the project can achieve its ambitious goal, the project has been designed along the Community, Climate and Biodiversity (CCB) Standards, a most trusted set of criteria and indicators for multiple-benefit land-based projects.

² A barangay is the smallest administrative division in the Philippines and is the native Filipino term for a village or district.

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Gen	Clim	Comm	Bio
G1.		Required	

GENERAL SECTION

G1. Original Conditions in the Project Area

General Information

G1.1 The location of the project and basic physical parameters (e.g., soil, geology, climate)

The Philippine Peñablanca Sustainable Reforestation Project (PPSRP) site is situated between latitudes of 17° 36' 14.66" N and 17° 41' 28.26" N and between longitudes of 121° 49' 12.55" E and 121° 52' 40.02" E in the Municipality of Peñablanca, Province of Cagayan in northern Luzon Island, Philippines (Figure 1). The project boundary encompasses an area of 2,943 hectares and ranges in five barangays (or the smallest administrative division in the Philippines, which collectively form a municipality, in this case Peñablanca): namely, Cabasan, Bugatay, Sisim, San Roque and Mangga. It is within the Peñablanca Protected Landscape and Seascape (PPLS). The project site is bordered by the Natulud Creek to the east and Arbin Creek to the south. The Pinacanauan River, although not closely bordering the project site, traverses from North to West of the area.

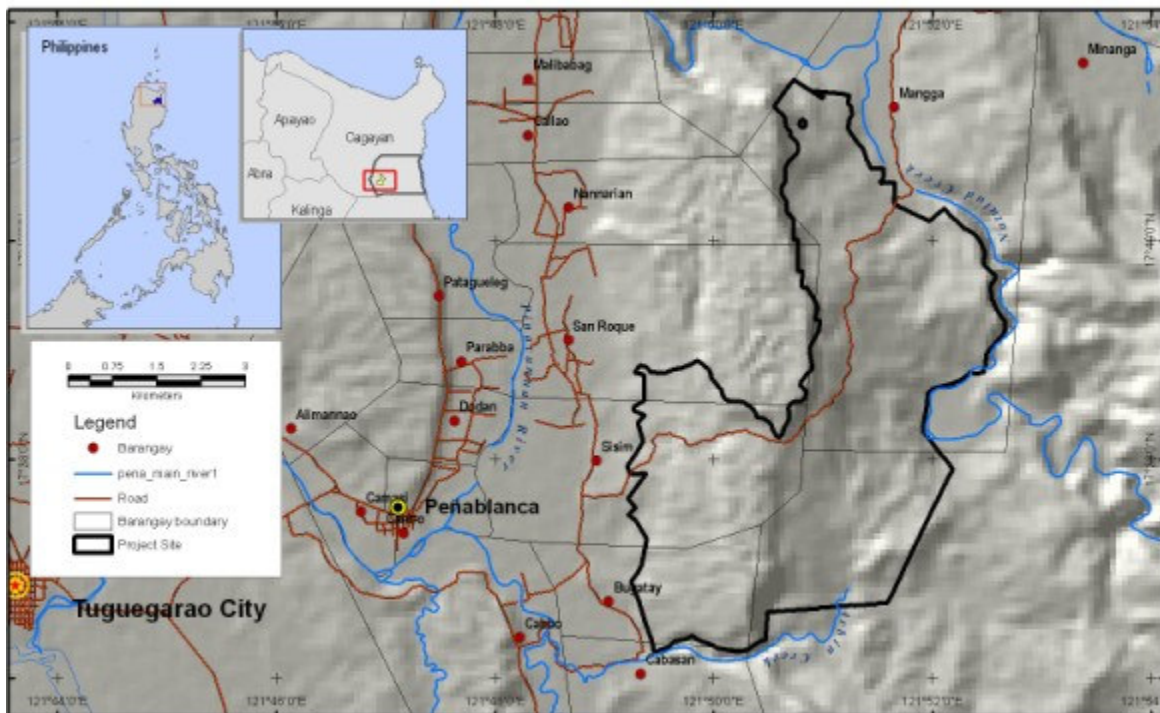


Figure 1. Location of the Philippine Peñablanca Sustainable Reforestation Project site.

About 80% of PPLS is forested lands, with old growth and mossy forest still intact. Conservation International (CI), Department of Natural Resources (DENR) and Haribon Foundation for the

Conservation of Nature, with funding from Critical Ecosystem Partnership Fund (CEPF), conducted nation-wide study for globally significant site for biodiversity conservation, and identified PPLS as one of the Key Biodiversity Areas³. The 118,782-hectare forest, coastal and marine ecosystem of the PPLS is home to several threatened and endemic species of plants and animals that include the critically endangered Philippine eagle (*Pithecophaga jefferyi*). It is also known for its more than 200 cave systems, which have provided a habitat to a variety of cave dwelling organisms; pristine river systems; and sites of archeological and historical significance.

The project site is also situated within the Pinacanauan River sub-watershed. The Pinacanauan River and its tributaries drains into the Cagayan River that supplies the domestic and irrigation needs of local farmers and also serves as a major watershed that supplies potable water to the nearby Tuguegarao City, the regional growth center of the Cagayan Valley Region , as well as other adjacent municipalities.

The basic physical parameters of the project area are as follows:

Topography and Soils

The general topography of the area is hilly, with occasional steep slopes along creeks (Figure 2). Elevation ranges from 40 meters above sea level (masl) to 460 masl. The topography of the area also delineates the three distinct soil types, namely – Ilagan Sandy Loam Eroded Phase, Faraon Clay and San Manuel Silty Loam that covers the project site (Figure 3). The ridge that is trending north to south on the southwest portion separates the San Manuel Silty Loam from the Ilagan Sandy Loam Eroded Phase. Another hill to the north, trending in the east-west direction separates the Faraon Clay with portions of San Manuel Silty Loam and undifferentiated mountain soils.

Geology

The lithographic units underlying the project area include limestone hills, shale/sandstone hills and minor alluvial plain (Figure 4). Limestone is the dominant bedrock which explains the formation of caves in the project area. Shale/sandstone are found in the southeastern hilly part of the project, while minor alluvial plain is present in the eastern part derived from weathering and erosion of pre-existing rocks deposited in the riverbed of Natulod River.

³ Conservation International Philippines, Department of Environment and Natural Resources-Protected Areas and Wildlife Bureau and Haribon Foundation. 2006. Priority Sites for Conservation in the Philippines: Key Biodiversity Areas. Quezon City, Philippines. 24pp.

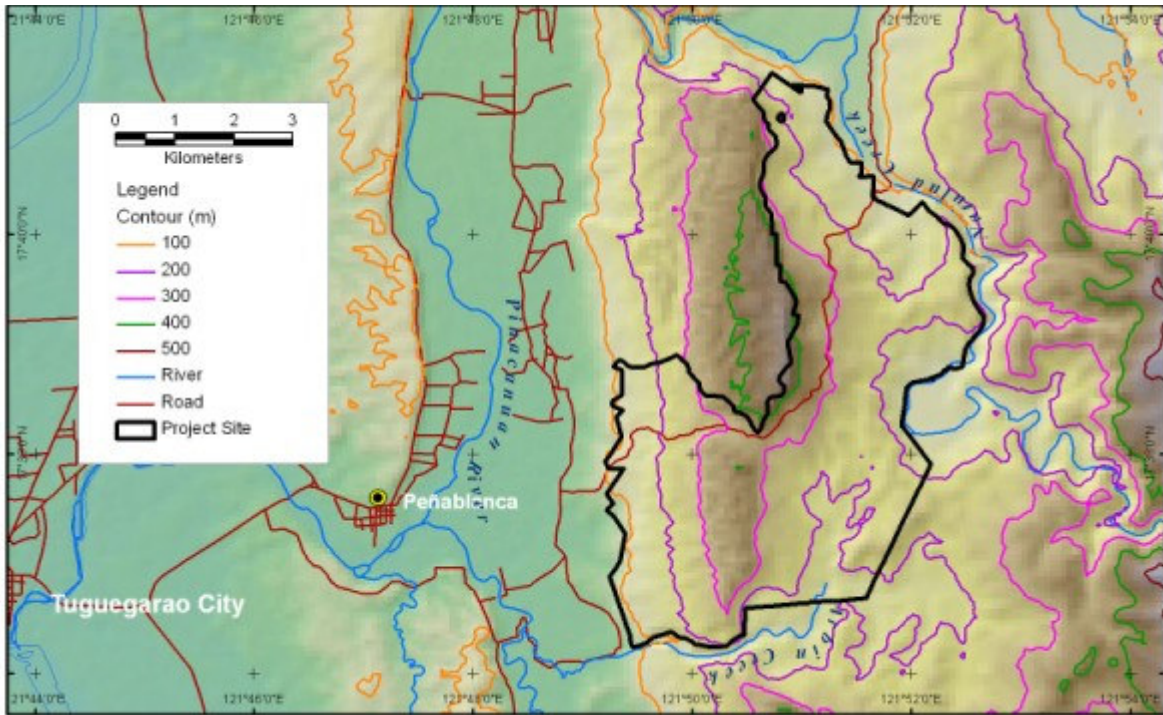


Figure 2. Topography of the project site.

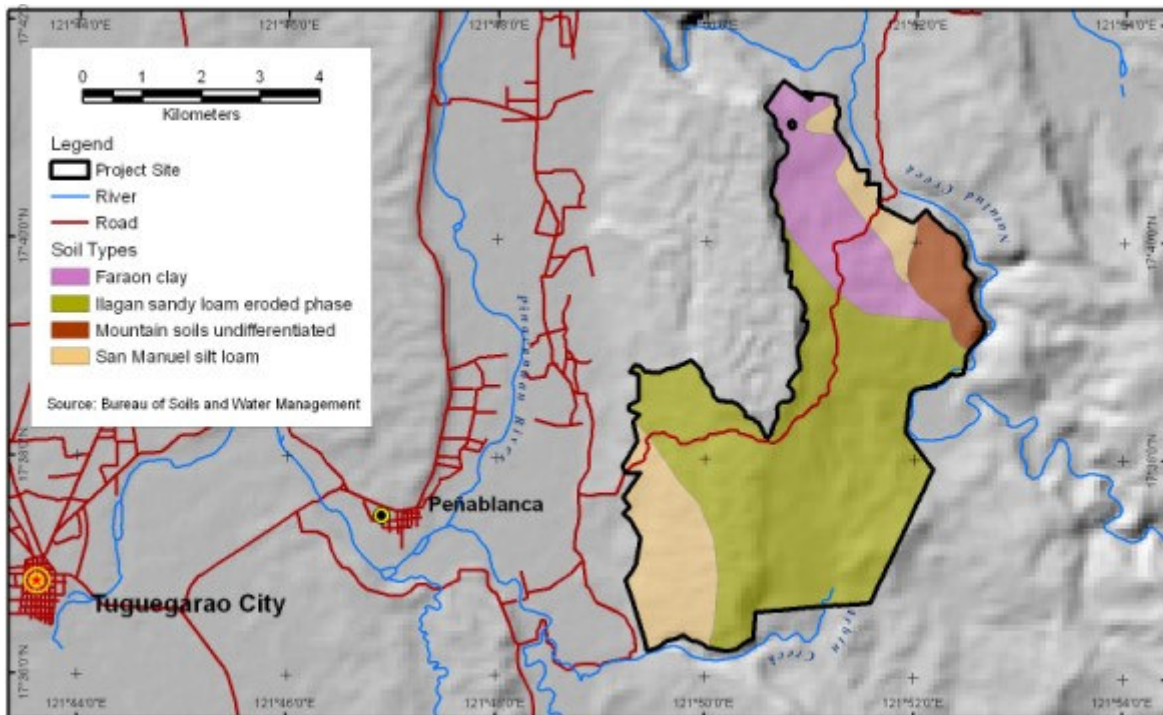


Figure 3. Soils map of the project site.

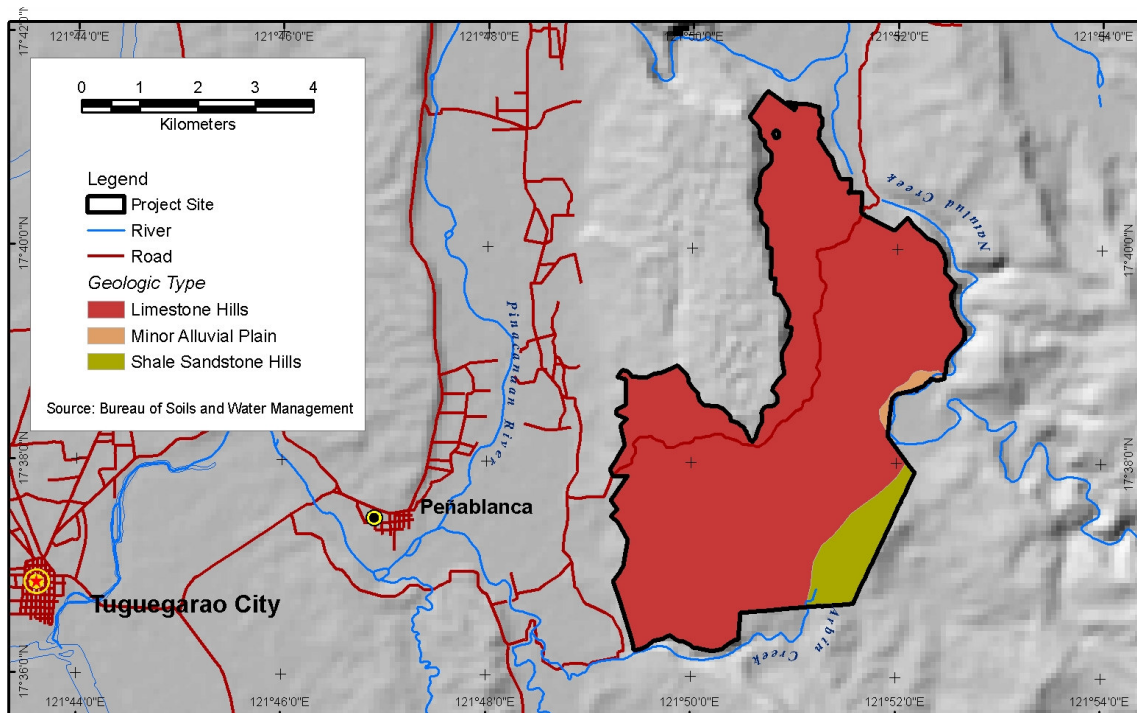


Figure 4. Geology map of the project site

Hydrology

The project site is the headwaters of several tributaries that feed into the Cabasan, Bossor, Arbin and Natulud Creeks (Figure 5). All of these creeks drain into the Pinacanauan River and together, these bodies of water serve as the main water sources for irrigation and domestic water use of the local communities, which comprise approximately 22,500 families. Deforestation in the project site has been associated to the downstream floods during the rainy season and droughts during the dry season. The Pinacanauan River, draining into the Cagayan River that supports the country's largest rice-growing region, usually overflows during the rainy season and causes massive flooding in the low-lying areas resulting in loss of life and property and substantial losses to the local economies.

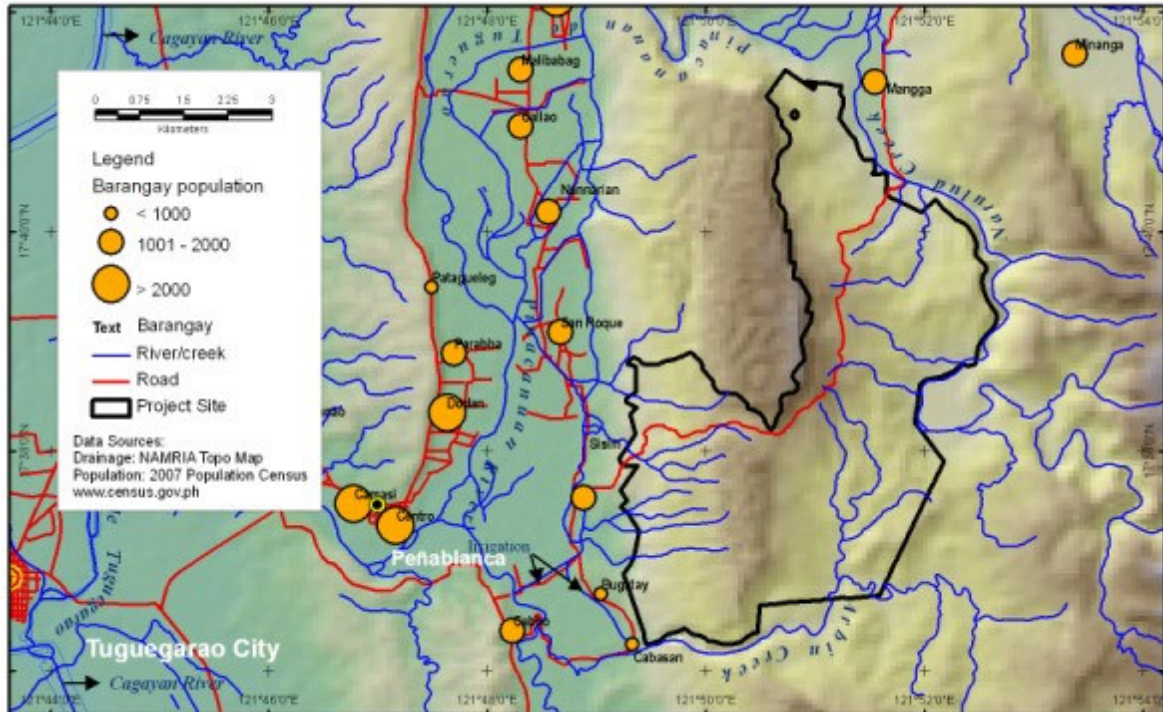


Figure 5. Drainage map of the project site showing the major rivers, creeks and tributaries and population centers.

Climate

The climate of the project site is characterized by no pronounced dry and wet seasons (type IV of the Corona climatic type classification), relatively dry from December to April and wet during the rest of the year. Rainfall is usually expected from July through December with either August or November as the peak of rainy season. Based on observed data by PAGASA from 1982-2007, average annual rainfall in the area is recorded at 1,691mm (Figure 6). Rainfall is mostly brought by monsoon rains and typhoons. Generally, December and January are the coolest months and May and June are the warmest. Cagayan Province has a mean annual temperature of 28°C with a mean minimum of 22°C and a maximum of 32°C.

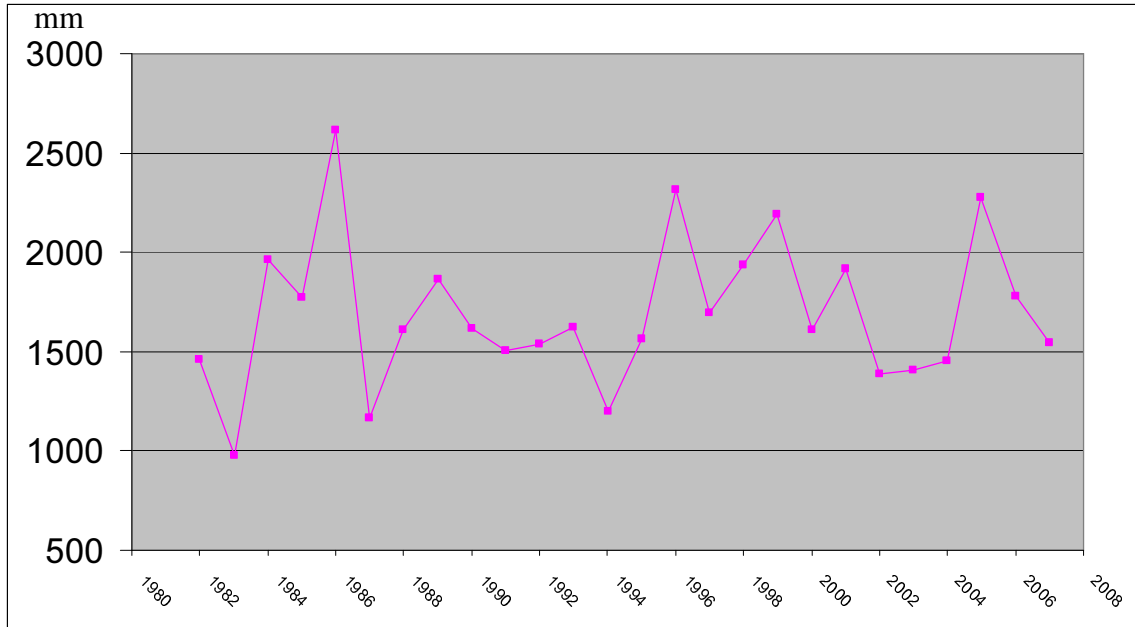


Figure 6. Annual rainfall (in mm) in the Municipality of Peñablanca, Cagayan Province, Philippines
 (Source: Philippine Atmospheric, Geophysical & Astronomical Services Administration, Region 02, Tuguegarao City.)

G1.2 The types and condition of vegetation within the project area

The project boundary covers 2,943.1 hectares (Table 1). Active interventions of reforestation, enhancement planting or agroforestry will take place in 2,500 hectares. Approximately 400 ha are excluded from active intervention as they are settlement areas, roads, river/creeks, or good quality forest patches. These forest patches, nonetheless, will receive forest protection from the project.

The project area was still forested in the 1960s (PPLS Management Plan, 2004). However, it was gradually deforested as a consequence of the land use policies promoting commercial logging implemented between 1970's and 1980's. Reforestation under the DENR was initiated in the late 1970s in areas within and adjacent to the project boundary that was planted with Teak and *Gmelina*. However, continued human intervention (frequent burning, grazing, shifting agricultural cultivation, over-collection of wood for fuel, etc.) has resulted in the land becoming severely degraded. This in turn contributed to serious problems with soil erosion that made it difficult for the planted trees to survive and/or thrive in the area.

The 2007 classified satellite image (Landsat 5 TM) and ground validation survey were used to produce a land-cover map (Figure 7). A majority of the project area is covered with grassland (44%) and open canopy forests cover (31%) (Table 1). Teak and *Gmelina* plantations from the late 1970s cover 12%. In the land cover mapping of the project area, we distinguished open canopy forest from closed canopy forest using satellite imagery and field surveys.

On the ground, open canopy forests was segregated, as having less than 50% canopy cover, from the closed canopy forests, as having equal to or greater than 50% canopy cover. Forests within the project boundary are generally fragmented open canopy forests interspersed with grasslands, shrublands, and Teak/Gmelina.

Grassland is the main land cover type, with a large concentration in the southwest portion of the project boundary. In the western side, some of the formerly grassy areas have already been planted with Teak/Gmelina. This area, however, would revert to grassland after the Teak/Gmelina is harvested. Shrubland⁴ are distinguished from forests as being vegetation less than 3 meters in stature.

Table 1. Area distribution per land-cover type within the project area.

Land Cover	Area (ha)	Percentage
Cultivated Area	3.6	0.1
Teak/Gmelina	349.8	11.9
Water	8.6	0.3
No data (Cloud/Shadow)	6.5	0.2
Bare	70.9	2.4
Grassland	1,297.5	44.1
Shrubland	195.5	6.6
Open Canopy Forest	923.6	31.4
Closed Canopy Forest	87.0	3.0
Total Area	2,943.1	100.0

⁴ Adopted the category in DENR Memorandum Circular2005-005, but operationalized it as woody vegetation not exceeding 3 m in height.

Climate Information

G1.4 Describe current carbon stocks within the project area(s), using stratification by land-use or vegetation type and methods of carbon calculation from IPCC 2006 GL for AFOLU or a more robust and detailed methodology

Areas for Afforestation/Reforestation (A/R) activities: A/R Areas

Applying the eligibility criteria for A/R CDM, 1,329 ha are considered for A/R activity carbon accounting (Table 2). These areas are referred to as the “A/R area.”

Table 2. Areas for A/R carbon accounting.

Land Cover	Agroforestry (ha)	Reforestation		Total Area (ha)
		Reforestation (ha)	Enhancement Planting (ha)	
Bare/Burnt	4	52	7	63
Shrubland	62	70	17	149
Cultivated Area	2	1		3
Grassland	316	689	109	1,114
Total Area for A/R Carbon Accounting (ha)	384	812	133	1,329

To determine the aboveground carbon stocks in the current land use, a total of 40 sample plots were established in the project area. These sample plots were distributed as follows: 10 plots (grassland, with <10% tree cover); 10 plots (grass with 10-30% tree cover); 10 plots (grass with >30% tree cover) and 10 plots (cornfield). The number of sample plots is based on the suggested number of plots indicated in the IPCC Good Practice Guidance (Chap 4, p 4.97). To ensure that there is good representation of the A/R areas when sampling was undertaken, stratification of the area was undertaken. Stratification was based on the method recommended in the IPCC 2006 Guidelines for Agriculture Forest and Other Land Use. The strata used and their corresponding carbon density are shown in Table 3 below.

Table 3. Average carbon density per stratum under baseline scenario.

Stratum Baseline	Average non-tree carbon stock (t/ha)	Number of Samples
Reforestation		
Grassland		
With <10% tree cover	1.81	10
With 10-30 % tree cover	2.02	10
With > 30% tree cover	1.67	10
Agroforestry		
Brgy. Bugatay (cornfield)	1.83	4
Brgy. Mangga (cornfield)	2.09	3
Brgy. Sisim (cornfield)	1.73	3

For each sample plot, a 2m x 2m quadrat was laid. All non-tree vegetation inside the quadrat were harvested and weighed while still on the field to determine the total fresh weight. From the harvested sample, a thoroughly mixed and representative sub-sample was then taken and weighed to get the sample fresh weight. Representative sub-sample was oven dried and weighed to determine a wet-dry ratio of the sample. Subsamples were taken in the laboratory for analysis to determine the carbon content of the grass/corn.

Biomass density per plot was calculated using the following equation:

$$ODW_t = TFW - \frac{(TFW * (SFW - SODW))}{SFW}$$

where,

ODW = total oven dry weight

TFW = total fresh weight

SFW = sample fresh weight

SODW = sample oven-dry weight

To determine the carbon density for each plot, biomass density was multiplied with the corresponding carbon content. Average carbon density of grassland and cornfield was then computed. Results show that the average aboveground carbon density of the grassland and cornfield are 1.81t/ha and 1.87t/ha, respectively. For shrubland, carbon density value derived from previous studies in the Philippines was used. For burnt/bare areas, biomass density was assumed to be zero.

Using these values, total carbon currently stored in the eligible areas for reforestation and agroforestry were determined (Table 4). The areas under both Reforestation and Enhancement Planting fulfill the eligibility criteria for A/R activities, and are treated identically in the carbon stock calculation. They remain differently termed in relation to the original project plan as described in G3. The total current carbon stock in the 1,329-ha A/R Areas is estimated at 4,072 tC.

Areas for Forest Conservation activities

Outside the eligible areas for A/R CDM, there are fragments of second growth forest (referred to as the “Forest Conservation Areas”). For these areas, the protection of the existing forests covering an area of 1010.67 ha will be undertaken. Using carbon density of 94.05 tC/ha (Lasco et al 2007), existing forests in the project area is estimated to hold a total of 95,054 tC. With the implementation of forest protection program as a result of the project, emissions of carbon from deforestation and degradation will be avoided. Based on the land use change analysis (1989-2007) made by Conservation International (2009; unpublished), the deforestation rate is estimated at 0.30%/year (see G2.3 for further discussion). Without the project, it is expected that deforestation will continue to occur which will consequently result to emissions of carbon.

In the sum of A/R areas and Forest Conservation Areas, the total carbon currently stored in the area amounts to 99,126 tC.

Table 4. Current carbon stocks of A/R and Forest Conservation Areas.

Component	Area (ha)	Carbon Density (tC/ha)	Carbon Stocks (tC)
A. Reforestation			
Grassland	689.4	1.81	1250.85
Bare/burnt	51.5	0.00	0.00
Shrubland	70.1	13.72	961.49
Cultivated	1.1	1.87	2.05
Total	812.1		2214.39
B. Enhancement planting			
Grassland	108.9	1.81	197.59
Bare/burnt	7.2	0.00	0.00
Shrubland	16.9	13.72	231.80
Total	133.0		429.39
C. Agroforestry			
Grassland	315.5	1.81	572.44
Bare/burnt	4.4	0.00	0.00
Shrubland	62.1	13.72	851.76
Cultivated	2.3	1.87	4.29
Total	384.2		1,428.50
D. Conservation Areas (REDD)			
Forests	1,010.67	94.05	95,054
TOTAL	2,340	--	99,126

Community Information

G1.5 Describe communities located in the project zone, including basic socio-economic and cultural information that describes the social, economic and cultural diversity within communities (wealth, gender, age, ethnicity etc.), identifies specific groups such as Indigenous Peoples and describes any community characteristics.

The project zone covers five communities of Cabasan, Bugatay, Sisim, San Roque and Manga which are adjacent to the project boundary. These communities have settlement backgrounds over a century with acculturated indigenous people (the Itawes) dominating up to 90% of the population and the rest are settlers, mostly Ibanag and Ilocanos, from neighboring provinces. As of 2008, the total population in these communities is 6,722 persons (in 1,391 households) out of 40,237 persons for the whole municipality of Peñablanca. Agriculture (especially farming) is the dominant source of livelihood, with the forest as source of supplemental income and energy needs.

The socioeconomic baseline research was conducted to describe and analyze the project's impact on the community at two levels: (a) the barangay level (community wide) to compare across the five project sites; and (b) at the household level, differentiating Family Participants (FP) and

non-participants (NP). Participatory Action Research (PAR) techniques (secondary data review, key informant interviews, Focus Group Dialogues and semi-structured interviews) were used.

Half of the households within project sites are farmers with very low incomes (monthly household income of \$68 to \$102), which makes them rely on the destructive use of forest resources (timber poaching, gathering and use of fuelwood and charcoal for cooking, and unregulated wildlife trade), informal and irregular employment, and labor out-migration. Household incomes of 20% to 60% across the 5 communities are below the poverty threshold in the province (PhP12,479,00 or USD277). Despite favorable and social assets, the communities located around the project area are low in financial, human and physical capital⁵.

Perceived open land in the PPLS communities encourages in-migration which leads to unplanned expansion of settlements. This is an increasing trend in communities closest to the lowlands where occupations and other livelihood may be available. The proximity of the project area to the regional urban center (Tuguegarao City) attracts in-migration towards the uplands and is fast reaching the most inaccessible and core forest protection areas in the PPLS.

Literacy is high (above 90%) while residential units are stable (semi-permanent) for more than half of households in all communities. Either through dumping or burning, solid waste disposal has to be improved. Access to potable water has yet to be addressed since households only in one community have their own faucet linked to a communal water system provided by the local government. Open drainage is the dominant toilet facility in all 5 barangays, making residents susceptible to communicable diseases. Very few households have their own water sealed with sewer or septic tanks.

The strain created by a growing local population has not been matched by additional investments in social services, leading to inadequate community health facilities and services; skills improvement programs for economic improvement despite high literacy rates; physical infrastructure and facilities needed in agriculture; mobility through good transportation facilities and roads, and other social services.

G1.6 Describe current land use and customary and legal property rights including community property in the project zone, identifying any ongoing or unresolved conflicts or disputes and identifying and describing any disputes over land tenure that were resolved during the last ten years (see also G5)

The project site is within the designated multiple use zone of the Peñablanca Protected Landscape and Seascape under the jurisdiction of the Government's Department of Environment and Natural Resources (DENR). There are six types of land cover classes inside the project area [refer back to Table 1 and Figure 7 on land cover]. Over these land-cover classes are tenured and untenured lands.

⁵ Financial assets refer to investment capital; physical assets include material infrastructure like roads, bridges, irrigation dams, production equipments, and communications facilities; human assets cover education, skills and talents; while social assets refer to kinship networks, community values, membership in organizations.

A total of 646.64 ha or 22% of land within the project site was awarded by the government to individual families in the local community through the Certificate of Stewardship Contract (CSC) (Figure 9). The CSC allows families to develop farm, and to maintain and protect the existing natural forest within their area. The CSC is valid for 25 years and renewable for another 25 years. However, majority of the CSC-tenured lands remained unproductive for lack of investment capital and appropriate farming skills and most of the farm activities are for corn production.

Untenured patches of slash and burn farms are also located in the project zone and within the project boundary, and these patches mostly support corn. Owners of cattle and carabaos graze their animals unattended in untenured areas without any permit from the government.

The project is facilitating to award land tenure to upland farmers cultivating outside of the CSC areas that have been cultivating them since at least five years prior to the proclamation of the PPLS in October, 2003 (to be considered as “tenured migrants”). The project is facilitating this DENR’s forest management strategy through encouraging and persuading tenured migrants who are project participants to sign the project’s Memorandum of Agreement (MOA) between the government (DENR), communities and CI to further commit them to be responsible tenure holder. Those with MOA with the project will be given legal title to the land they are presently cultivating. The MOAs stipulate benefits of participating in the project as well as what is expected as participants; thus, the farmers signing MOA is considered as beneficiaries of the project (Appendix 1 for a copy of MOA). This is a crucial arrangement in protecting the area from further unplanned settlement expansions and forest degradation. The MOA also stipulates sharing revenue from project-supported agroforestry activities for livelihood improvement and expansion of reforestation activities. This revenue-sharing mechanism is a financial scheme named “Reforestation Fund.” This fund is crucial for sustainability of the project after the initial funding ends.

Furthermore, the DENR Regional Executive Director has committed to approve/renew long-term tenure instruments for the tenure holders participating in the project for another 25 years, upon reaching their expirations (Appendix 2 Letter of DENR support).

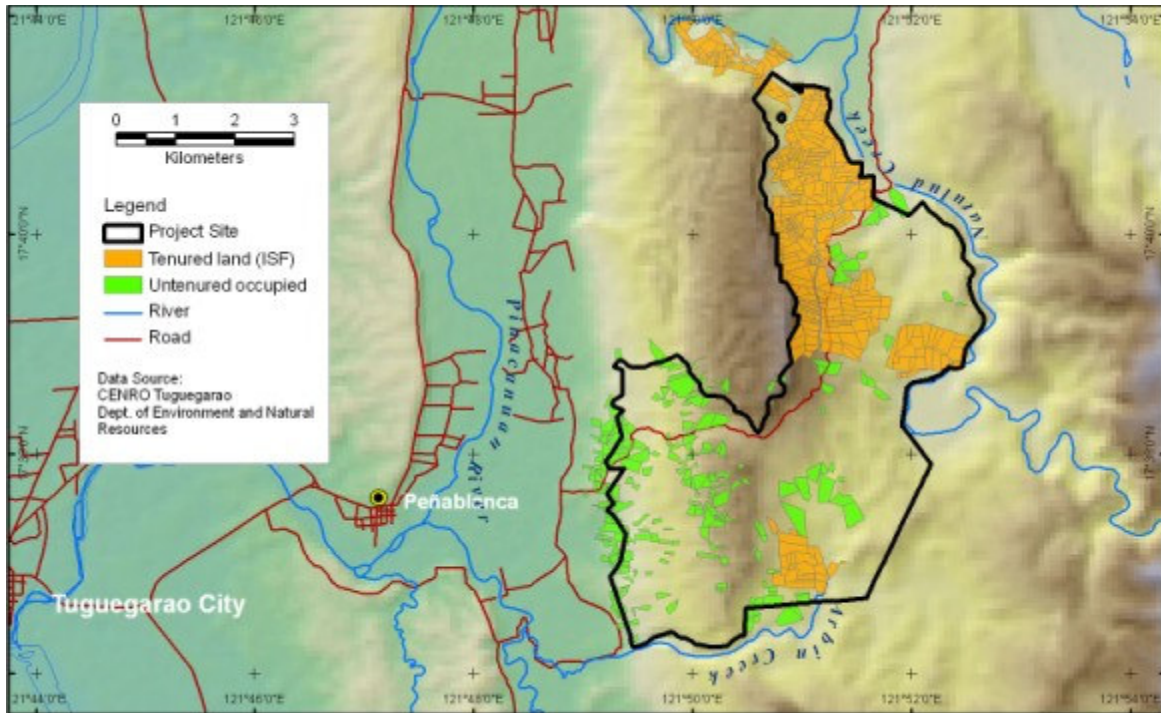


Figure 9. Map of land tenure status showing tenured land (Integrated Social Forestry) and untenured occupied land.

Biodiversity Information

G1.7 Describe current biodiversity within the project zone (diversity of species and ecosystems) and threats to that biodiversity, using appropriate methodologies, substantiated where possible with appropriate reference material.

Flora and fauna surveys by Conservation International Philippines provide the following as the current conditions of, as well as the threats to, biodiversity in the project zone.

Flora

Flora and fauna surveys by Conservation International Philippines provide the following as the current conditions of, as well as the threats to, biodiversity in the project zone. Fieldworks were conducted from April – June 2008, October – December 2008, and April – May 2009. The Braun-Blanquet Relevè Method was used in surveying all flora plots (200 m x 20 m). While traversing this strip two or three times, all vascular plant species encountered (seed plants, ferns and fern allies) in various growth-forms (trees, proto-terrestrial herbs, lianas, epiphytes, and hemi-parasites) were enumerated.

A total of 339 species of plants belonging to 255 genera in 80 families were documented to occur within the project zone (Appendix 3). At least 190 are indigenous species (24 of which are endemic to the country) and at least 42 species have been identified as introduced, majority of which are already considered as naturalized.

The dominant vegetation in the area is the grasses and weeds (mostly of the Family Compositae and Graminae) that have good tolerance for periodic grass fires and prolonged grazing by

ruminants. Patches of pioneer tree species (*Gymnosporia spinosa*, *Pittosporum* sp., *Guioa pleuropis*, *Antidesma ghaesmbilla*, *Cratoxylum sumatranum*, *Chionanthus ramiflorus* and *Neonauclea reticuloata*) can be found in less disturbed sites, particularly along gullies and creeks, serving as refugia for other shade tolerant species to re-establish themselves.

Fauna

Systematic surveys focused on recording data only for birds and mammals which will also be the focus species for subsequent monitoring activities. These taxa were chosen primarily for the ease of monitoring temporal trends of the impact of project activities. Information on other taxa was collected by more opportunistic methods.

BIRDS. Transect lines of 1.5-2.0 kilometers were established for each type of habitat. Monofilament mist-nets of 35 mm mesh size, 2 meters high and 6.5, 9 and 12 meters wide were also used. Nets were hoisted as ground or sky nets along possible flight path of birds (i.e., near feeding trees, natural forest gap or opening, etc.) to capture cryptic species that were difficult to detect during transect surveys. Nomenclature, classification and distribution of birds were based on Kennedy et al. (2000).

A total of 125 species of birds belonging to 40 families and 87 genera were recorded within the project zone (Appendix 4). Ninety percent (90%) of the birds are residents; they are known to breed or suspected to breed within the country. Forty-one species (33%) are endemics to the country, with six endemic species restricted to the island of Luzon. Thirteen are migratory species. The avifauna of the project zone constitutes 22% of the 572 species of birds known to occur in the Philippines. Both grassland-dependent and forest-dependent species were recorded.

MAMMALS. Victor rat traps and museum special snap traps were used to capture small non-volant mammals (i.e., rodents and shrews). Mist-nets with an average mesh size of 36 mm with height of 2.5 meters and width of 6.5, 9 or 12 meters were used to catch bats. The nets were strategically placed along ridges and streams, along forest clearings, and other areas that are possible flyways of bats. The harp trap was used to catch free flying bats and is generally set at locations where bats' flyways are constricted, such as cave and mine entrances, and narrow points in forest trails. For bats and small non-volant mammals, taxonomy and nomenclature follows Heaney et al. (2008).

For the mammals, a total of 20 species belonging to six families and 13 genera occurs within the project area (Appendix 5). This includes one species of shrew, four rodents, and 15 species of volant mammals (bats). Six species (30%) are endemics, two rodents (*Rattus everetti*, a common species found all throughout the country both in disturbed and primary forested habitats; and *Apomys* sp., commonly found in forested habitats and uncommon in secondary forests) and four bats (one fruit bat, *Ptenochirus jabori*, and three insectivorous bats, *Hipposideros* cf *obscurus*, *Rhinolophus* cf *rufus* and *R. virgo*) that are common in forested habitats but have been observed to be occasionally present in disturbed habitats near forests.

INFORMATION FROM OPPORTUNISTIC OBSERVATIONS. Direct observation of snares, called "silo," set by local people, footprints, fecal droppings, nests, and animal remains were also noted including information on animals traded in nearby villages, especially if these animals

were taken from within the survey site. Additional bird sightings within the vicinity, in particular those not observed during the transect survey nor caught in the nets and traps were also noted.

Based on direct observations by local people and key informant interviews,⁶ two large mammals are commonly observed within the project zone: threatened endemic Philippine Warty Pig (*Sus philippensis*; IUCN VU) and Philippine Deer (*Cervus mariannus*; IUCN VU). Footprints, fecal droppings and food remains were frequently seen within and near the project site. The Monitor Lizard (*Varanus salvator*) locally known as Bayawak and the Gray's Monitor Lizard (*Varanus olivaceus*) known as "Batikaw" were also observed within the project site.

ECOSYSTEMS. The dominant vegetation within the project site can be characterized as the *parang* formation, which is a fire disclimax community of *Themeda triandra*, *Themeda gigantea*, *Imperata cylindrica* and other grasses that have strong tolerance for periodic grassfires and prolonged grazing by ruminants. Patches of pioneer tree species mostly composed of *Gymnosporia spinosa*, *Pittosporum* sp., *Guioa pleuropteris*, *Antidesma ghaesembilla*, *Cratoxylum sumatranum*, *Chionanthus ramiflorus* and *Neonauclea* can be found in less disturbed sites. Altogether, these patches serve as refugia for other shade tolerant species to re-establish themselves. They are under threat of the expansion of slash-and-burn farming (or "kaingin"), firewood gathering and charcoal making.

Threatened Species

Nine species of plants (*Azelia rhomboidea*, *Aglaia cumingiana*, *Artocarpus blancoi*, *Artocarpus treculianus*, *Ficus ulmifolia*, *Macaranga grandifolia*, *Pterocarpus indicus*, *Sandoricum vidalii* and *Vitex parviflora*) are listed as vulnerable in the 2008 IUCN red list of threatened species (www.redlist.org). Five of these (*Artocarpus blancoi*, *Artocarpus treculianus*, *Ficus ulmifolia*, *Macaranga grandifolia*, and *Sandoricum vidalii*) are endemic to the country. The National Red List of Threatened Plants (DENR Administrative Order 2007-1, Edwino et al., 2008) lists additional two species (*Aphanamixis polystachya* (VU) and *Diospyros pilosanthera* (EN)) as threatened. As for the fauna, two of the endemic species of birds (*Anas luzonica* and *Bubo philippensis*) are listed as vulnerable in the 2008 IUCN Red List.

Threats to these species continue to be the loss of habitat due mainly to the destruction of forests. Although there has been no recent record of hunting within the project zone, it is possible that the threatened bird species (*Anas luzonica* and *Bubo philippensis*) are still being captured for food since these two are the largest species of birds that is found within the project zone.

⁶ Key informant interviews, conducted quarterly by Community Monitoring Group, is part of the project's Biodiversity Monitoring.

G1.8 Evaluate whether the project zone includes any of the following High Conservation Values (HCVs) and describe the qualifying attributes:

G1.8.1 Globally, regionally or nationally significant concentrations of biodiversity values: a) protected areas; b) threatened species; c) endemic species (define the level of endemism); d) areas that support significant concentrations of a species during any time in their lifecycle

Conservation International – Philippines conducted biological surveys during April - June 2008; October – December 2008 and April – May 2009 in the project zone. Eleven threatened species have been recorded. Two species of birds, *Anas luzonica* and *Bubo philippensis*, are listed as vulnerable in the 2008 IUCN Red List of Threatened Species (www.redlist.org) and nine species of plants (*Azelia rhomboidea*, *Aglaia cumingiana*, *Artocarpus blancoi*, *Artocarpus treculianus*, *Ficus ulmifolia*, *Macaranga grandifolia*, *Pterocarpus indicus*, *Sandoricum vidalii* and *Vitex parviflora*). Of the nine threatened species of plants, five (*Artocarpus blancoi*, *Artocarpus treculianus*, *Ficus ulmifolia*, *Macaranga grandifolia*, and *Sandoricum vidalii*) are endemic to the country. An additional two species (*Aphanamixis polystachya* and *Diospyros pilosanthera*) are also listed as threatened under the National Red List of Threatened Plants (DENR Administrative Order 2007-1, Edwino et al., 2008).

As for the number of endemic species found within the project zone, a total of 71 species were recorded composed of 24 species of flora, 41 species of birds and six species of mammals that can only be found in the country. Of the six endemic mammals recorded, two of which are rodents, the *Rattus everetti* which is a common species found all throughout the country both in disturbed and primary forested habitats; and *Apomys* sp., commonly found in forested habitats and uncommon in secondary forests and four bats (one fruit bat, *Ptenochirus jabori*, and three insectivorous bats, *Hipposideros cf obscurus*, *Rhinolophus cf rufus* and *R. virgo*) that are common in forested habitats but have been observed to be occasionally present in disturbed habitats near forests. Additional two threatened endemic species of large mammals, *Cervus mariannus* and *Sus philippensis*, have been reported from the project zone through direct observation and key informant interviews.

G1.8.2 Globally, regionally or nationally significant large landscape-level areas where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance

There are no HCV's of this type identified within the project zone.

The project zone includes a mixture of various land covers and land uses, such as forest, grassland, shrubland, upland and lowland farms, and built-up areas. Closed-canopy forests (mostly primary or natural) exist in fragmented, small patches, and open-canopy forests (mostly secondary) are also fragmented and disturbed by human activities. Under these settings, there are no landscape level areas that support viable populations of naturally occurring species under natural patterns of distribution and abundance.

G1.8.3 Threatened or rare ecosystems

There are no HCV's of this type identified within the project zone.

The ecosystems in the project zone are rather common and typical; no natural forest patches, riverine, grassland or shrubland represent ecosystems that are naturally rare or unique. The remaining natural forests are not rare in species composition.

The degraded condition of the project zone makes it unlikely that important site feature for ecosystem services and supporting biodiversity is present. However, the remaining forest of Sierra Madre to the east of the project zone qualifies as a HCV. It has been identified as one of Key Biodiversity Areas (KBAs) that support at least 28 globally threatened species (Conservation International Philippines et al., 2006; with correction).

G1.8.4 Areas that provide critical ecosystem services

The piped water distribution system benefits 115 households in barangay Cabasan. The water source of this system taps the springs in the southern part of the project, particularly draining to Arbin Creek. To manage this water system and its watershed, the Cabasan Barangay Waterworks and Sanitation Association (BAWASA) was organized. With the support of the municipal Local Government Unit of Peñablanca, it maintains fences on the perimeter of the watershed.

In barangay San Roque, a similar water system currently benefits 30 households and additional 276 households are expected to benefit with a planned expansion. This community is protecting the watershed of the spring source and has initiated some tree planting activities to improve the forest cover. Barangays Sisim and Bugatay are likewise benefiting similarly from springs tapped to provide their respective households with potable water.

Domestic water supply is specifically singled out as the critical ecosystem service since these communities are so much dependent on it. Hence, those spring sites have been identified as HCV for the communities.

The current conditions are not conducive for the site to provide high ecosystem services. It is one of the motives of conducting the project in the first place. The project activities have been designed to provide or improve ecosystem services. For instance, the reforestation and forest protection activities coupled with conservation awareness raising campaign are expected to reduce grassfires occurring within the project area that sometimes threaten nearby communities, increase vegetation cover that helps minimize soil erosion, and improve the capacity of the site as a watershed.

G1.8.5 Areas that are fundamental for meeting the basic needs of local communities

There are no HCV's of this type identified within the project zone.

The first layer of those who access the forest resources within the project area include those from Cabasan, Bugatay, Sisim, San Roque and Mangga. Those from the second layer, that is those

from the project zone beyond these 5 communities, are a few residents who pursue slash-and-burn farming and unregulated activities like charcoal making, firewood gathering and logging within the project zone. Economic baseline data from these communities indicate, however, that resources from project zone are, although useful, not fundamental to these communities inasmuch as they have other sources of livelihood and other forest areas from which they can secure these resources.

G1.8.6 Areas that are critical for the traditional cultural identity of communities

No HCVs of this type have been identified within the project zone.

The populations of the project zone communities are acculturated indigenous peoples with their origins in the Itawes and Ybanags. Within Dodan, Callao and Parabba are Itawes (as much as 91%, 92% and 96% of the total population, respectively), with in-migrants like Ilocanos and Tagalogs gradually increasing in number as they are closer to the urban center. Mangga and Minanga on the northeast toward the south have as much as 98% of the population as Itawes. They have been mainstreamed in the ways of life of major ethnic groups in Luzon over the past 100 years, hence are no longer considered as indigenous peoples in the country. Indigenous tradition is no longer practiced, and they do not identify any traditional cultural significance of the project zone.

Gen	Clim	Comm	Bio
G2.		Required	

G2. Baseline Projections

G2.1 Describe the most likely land-use scenario in the absence of the project following IPCC 2006 GL for AFOLU or a more robust and detailed methodology, describing the range of potential land-use scenarios and the associated drivers of GHG emissions and justifying why the land-use scenario selected is most likely

Considering currently implemented land-use policies, economic and social conditions in the project area, and information gathered through field surveys and interviews with stakeholders, in the absence of the project (baseline scenario) the most likely land use in the project area is the continuing cultivation of marginally profitable agricultural crops and pasturelands. Agricultural land includes production of corn, rice, vegetables and other annual crops such as peanut, beans, sweet potato and some fruit trees like cacao. The field surveys and interviews have shown that in addition to clearing for agriculture, all barangays use what little forest resources are found within the project site and adjacent areas to supply energy needs of the local households and to supplement their income. Such forest uses further contribute to deforestation and degradation in the project area.

The deforestation rate, which is used for forest conservation areas, has been estimated from the analysis of satellite imageries. In a forest change detection map released by Conservation International (CI) in 2007 (CI, 2007) indicated a mean annual forest clearance rate of 0.06% over the Sierra Madre biodiversity corridor between 1990 and 2000. If that map is cropped up to zoom into the Peñablanca Protected Landscape and Seascape (PPLS), this will put out forest clearance at an annual deforestation rate of 76 hectares between 1990 and 2000. In another study such as that from Resource, Environment and Economics Center for Studies (REECS) showed a decreasing trend in forest cover within a portion of the PPLS, which is the Pinacanauan sub-watershed. Between 1990 and 2002, REECS reported an annual decrease in forest cover by 167 hectares. This is more than twice the deforestation rate reported by Conservation International (CI).

Another separate study analyzing and detecting forest clearance between 1989 and 2007 by CI was done in 2009 using a machine-learning, classification technique for a satellite imagery scene to increase interpretation accuracy. The study covered an image frame of 41km x 46km around the project area (the justification for using the values from an area much larger than the project area is provided in Appendix 6). The study showed an annual deforestation rate of 74 hectares for open canopy with close canopy forest coming back at a rate of 9 hectares per year. Combining the open and close canopies, an average deforestation rate of 65 hectares per year was estimated between 1989 and 2000. This observation showed that open canopy forest was very prone to tree clearance. Open canopy forest had a tendency to expand adjacent to closed canopy forests, since the dispersal process and survival of propagules or natural regenerants were conducive.

Table 5 shows that annually, grassland and secondary forest declined by an average of 428.9 ha (1.24%) and 74.2 ha (0.30%), respectively. Cultivated areas (or agriculture) and bare lands, however, expanded by 302.7 ha (0.76%) and 46.1 ha (10.03%), respectively. Teak/Gmelina

plantation increased its coverage by 58.8 ha (4%). It is expected that this trend in forest cover loss would continue into the future in the absence of a well-organized reforestation project.

Table 5. Land cover change between 1989-2007*.

Land Cover	1989 (ha)	2007 (ha)	difference	Average Annual Change	
				(ha/yr)	(%)
Cultivated area	39,812.5	45,261.2	5,448.7	302.7	0.76
Built-up	2,304.5	4,203.1	1,898.5	105.5	4.58
Teak/Gmelina	1,468.0	2,526.1	1,058.1	58.8	4.00
Riverbank	908.6	2,119.0	1,210.4	67.2	7.40
Water	6,841.2	3,876.9	-2,964.3	-164.7	-2.41
Bare	459.5	1,289.0	829.5	46.1	10.03
Grassland	34,725.1	27,004.8	-7,720.2	-428.9	-1.24
Shrubland	3,088.3	4,505.8	1,417.5	78.7	2.55
Open canopy forest	24,383.3	23,046.9	-1,336.4	-74.2	-0.30
Closed canopy forest	50,689.3	50,847.5	158.2	8.8	0.02
Total Area =	164,680	164,680	0.0	0.0	

*Based on satellite image dimensions: width =40,950.00m; height =45,852.75m

The expanded built-up area is associated with higher population, which in turn demands more lands for cultivation—hence the observed increase in agriculture/farm lands. Parallel to this is the added pressure to use the natural forest for firewood and charcoal, including lumber, which contributed further to the degradation of the secondary forest and towards its transformation into shrubland or grassland. Based on this analysis, the project area is expected to continue degrading in the absence of the project activities.

G2.2 Document that project benefits would not have occurred in the absence of the project, explaining how existing laws or regulations would likely affect land use and justifying that the benefits being claimed by the project are truly ‘additional’ and would be unlikely to occur without the project.

Interviews with stakeholders and land use surveys were conducted with 355 individuals in the five covered barangays. These interviews show that similar lands in the vicinity are not being converted to either commercial tree plantations or agroforestry. Investment barriers deny land holders (generally small farmers or communities without access to credit) the financial and

human capital to invest in the inputs required for commercial timber or agroforestry production, such as seeds or necessary equipment.

Institutional barriers prevent farmers from being key market players or manipulating the chain from investment through production and sales. This is because farmers' economic activities are very limited and their influence to local economy is weak in the absence of well organized farmers group or network.

Technological barriers limit the access of farmers to quality seed, as the production of these seeds is not possible without specialized technical knowledge. In addition, farmers and communities lack the necessary skills for commercial timber or agroforestry plantations.

Cultural barriers exist as well, since like many other small farmers, the smallholders in the project area are generally risk-adverse. Farmers tend to be conservative, and seek to maintain a predic, steady income as opposed to taking undue market risks with their limited capital and diverging into new income streams. The field surveys and interviews with stakeholders indicated that the only realistic and credible alternative available to the project participants is to continue the current marginal agricultural practices.

While it is expected that protection should be undertaken in PPLS because it has been declared as a protected area, in reality such thing does not happen. This is manifested by the observed conversion of forests into other land uses as shown by the land use change analysis (1989-2007) undertaken by CI Philippines in the area. Based on this analysis, the rate of deforestation is around 0.30% per year. With the project however, deforestation will be reduced because of the forest protection component that will be undertaken by the project. DENR is beset with its own institutional weaknesses. The Pinacanauan River watershed, in which the project site is situated, has at least 42,000 ha of natural forest and shrubland areas that demand regular monitoring and patrolling. However, the budget allocation for patrol operations to enforce forest land use plan and forest/protected area laws is approximately PhP20,000 per year only (or USD444). This is exacerbated by increasing demographic pressures causing more forestland conversion into farmlands. This situation establishes the additionality of the project.

G2.3 Calculate the estimated carbon stock changes associated with the 'without project' reference scenario described above. Provide estimation of carbon stocks for each of the land-use classes of concern and a definition of the carbon pools included, among the classes defined in the IPCC 2006 GL for AFOLU. The timeframe for this analysis can be either the project lifetime (see G3) or the project GHG accounting period, whichever is more appropriate. Estimate the net change in the emissions of non-CO₂ GHG emissions such as CH₄ and N₂O in the 'without project' scenario. Non-CO₂ gases must be included if they are likely to account for more than 5% (in terms of CO₂-equivalent) of the project's overall GHG impact over each monitoring period. Projects whose activities are designed to avoid GHG emissions (e.g., REDD) must include an analysis of the relevant drivers and rates of deforestation and/or degradation and a description and justification of the approaches, assumptions and data used to perform this analysis.

For the A/R Areas, AR AMS0001 v.5 has been used to determine the baseline carbon stock changes. The land currently in grassland, shrubland, or cultivated area will continue to be

degraded, according to the analysis in G2.1. Hence, the baseline carbon stock change in the A/R Areas is assumed to be zero.

For the Forest Conservation Areas, the existing forest vegetation is expected to decrease (to be converted to grassland, shrubland, or cultivated land). Since majority of remaining forest patch is open-canopy forest (Table 1), the deforestation rate for the project area is estimated at 0.30%/year (Table 4; open-canopy forest).

There is another analysis of land cover change in the region including the project area that reports a higher deforestation rate. A study by Resource, Environment and Economics Center for Studies (REECS, 2005) reported the deforestation rate in the Pinacanauan sub-watershed between 1990 and 2002 to be 0.50%/year. The deforestation rate of 0.30%/year is adopted as a more conservative estimate. For the purpose of *ex ante* calculation, a constant deforestation rate was used for the entire 30-year GHG accounting period. However, baselines will be checked and necessary adjustments will be made every 10 years.

Carbon stock change through this conversion has been estimated by multiplying the area of expected forest loss with the corresponding carbon density. In the absence of the project, the total carbon stock of the project site is expected to decrease by 7,932 tC in 30 years (Table 6).

Table 6. Future carbon stock change projection (in tC) for secondary growth forest under “without project” scenario, referenced to Year 1.

Year	Secondary growth forest
	94 tC/ha
1	0
2	-285
3	-569
4	-853
5	-1,136
6	-1,417
7	-1,698
8	-1,978
9	-2,257
10	-2,536
11	-2,813
12	-3,090
13	-3,366
14	-3,641
15	-3,915
16	-4,189
17	-4,461
18	-4,733
19	-5,004
20	-5,274
21	-5,544
22	-5,812
23	-6,080
24	-6,347
25	-6,613
26	-6,878
27	-7,143
28	-7,406
29	-7,669
30	-7,932

G2.4 Describe how the ‘without project’ reference scenario would affect communities in the project zone, including the impact of likely changes in water, soil and other locally important ecosystem services.

Several studies are available to establish the “without project” reference scenario. Resource Environment and Economics Center for Studies provides projection for impacts on hydrology of the Pinacanauan River watershed, which include the project area (REECS, 2005a), and economic considerations (REECS, 2005b, c). Sambale (2006) is a study on socioeconomic drivers of deforestation in PPLS. Conservation International (2008) is a compilation of lessons from the experiences in PPLS, which include useful account for people’s behavior. National Irrigation Administration (2006) provides data on soil loss. Municipal and regional development plans (Peñablanca Municipal LGU, 2003; Regional Development Council Region 02, 2005) serve as good bases to determine baseline land use scenario. Based on these, the “without project” reference scenario is as follows.

A. *Possible scenario without the project*

In terms of scenario without the project, the following are expected consequences of no specific management scheme or guidelines (these are the concerns the project is trying to address):

1. Encroachment or in-migration within the project area/project zone and even in the other forested areas neighboring the project area. The satellite data shows the built-up area almost doubled in the vicinity of the project area during 1989-2007 (Table 5).
2. Continuous opening of new areas for farming/land conversion.
3. Increase and more cutting of firewood, lumber and charcoal making
The effects of charcoal making in the uplands include adverse accelerated soil erosion that varies on the degree of slopes where gathering of fuelwood are located. Data shows that the average production of charcoal in the community ranges from 400 – 992 sacks in a month which has a very significant impact on forest depletion, soil erosion and the likes. The maximum erosion threshold of 12 tons/ha/year is readily surpassed in the case of human-induced activities such as farm cultivation which includes charcoal making, corn farming and cultural practices inherent in intensively managed corn farms in the sloping lands where erosion rates goes up to even 50-60tons/ha/year. This rate of erosion would rob off the land fertile topsoil that should otherwise sustain farming and plantation viability in the long-term.
4. Wide spread monoculture (corn) farming practices and dependence in chemical use in farming (synthetic chemicals: insecticide, herbicide, etc) also add negative impact. If the practice should proceed unchecked for longer periods, the potential for polluting the soil and water resources would be very high
5. Bringing of more cattle within the area, increasing the risk of fire occurrences. Cattle owners tend to burn grassland to stimulate fresh growth of grasses, which could, and often does, burn areas that they do not intend to burn.
6. Environmental awareness will not be internalized by the locals
7. Limited concern to environment conservation
8. Forest cover changes were mostly converted to shrubland and grassland

B. Threats without the project

Of the enumerated scenarios without the project, there are expected adverse consequences if no countermeasures are implemented.

Threat to Soil:

1. Depletion of soil fertility due to mono cropping (corn) and high dependence on chemical inputs (e.g., herbicide, pesticide)
2. Low water absorbing capacity of the soil due to compaction from grazing animals and regular burning of the site
3. High risks of soil erosion /land slides/scouring of river/creek banks
4. Decline soil retention that favors surface run off / top flooding

Threat to water

1. Adverse effect lowering water quality and supply sources for both domestic and irrigation purposes
2. Drying /of creeks, springs and decreasing of river discharge during summer due to reduced infiltration, reduced aquifer and spring recharge brought by soil compaction and land cover deterioration
3. Siltation of Pinacanauan River

Threat to ecotourism

1. Decrease in number and density of wildlife species (especially fruit bats) resulting to reduced tourism attraction
2. Continuous and uncontrolled erosion will destroy the structure of Protected Landscapes for ecotourism
3. Another ecotourism attraction in the PPLS is the Pinacanauan River. Deforestation will increase turbidity of the river which negatively affects its ecotourism value

Threat to human / community

1. Flooding of low lying areas / communities like Tuguegarao City associated to the deforestation of the sub-watershed and micro-watershed areas
2. Expected increase of environment temperature due to decrease of forest vegetation
3. Insufficient or poor water quality for irrigation decreases farmers' income leading to a more impoverished family
4. Outbreak of water-borne diseases due to poor quality potable water for the community as a result of deforestation

Threats to biodiversity

1. Continuous conversion of forest land to slash-and-burn cultivation and forest product extraction resulting to further fragmentation of wildlife habitat
2. Uncontrolled wildlife hunting that will lead to local decimation of wildlife species especially those belonging to the category of threatened species
3. Loss of habitat tends to disrupt food web and imbalance ecosystem resulting to decreased level of biodiversity
4. Increase of invasive non-native species of plants and animals that alter biodiversity composition and slows the regeneration, growth and reproduction of different endemic species
5. Grassland fires lead to hampering ecological succession thereby minimizing the growth of species diversity in the area.

G2.5 Describe how the 'without project' reference scenario would affect biodiversity in the project zone.

Under the without-project reference scenario, the current land-use trend will continue. Biodiversity loss is expected due to continuing habitat destruction by the local community. Unsustainable activity such as slash and burn farming (locally known as “kaingin”), grazing and frequent fire occurrence during summer, firewood gathering and charcoal making practice will continue to deplete the remaining habitat of species of original (i.e., forest) flora and fauna.

The project zone is dominated by vegetation types of grasses, tolerant to periodic grassfires and prolonged grazing by ruminants. However, patches of pioneer tree species, mostly composed of *Gymnosporia spinosa*, *Pittosporum* sp., *Guioa pleuropteris*, *Antidesma ghaesembilla*, *Cratoxylum sumatranum*, *Chionanthus ramiflorus* and *Neonauclea* can be found in less disturbed sites. These patches serve as refugia for species of plants and animals from the original forested landscape and seed-dispersers. Flora survey by Conservation International Philippines recorded 339 species belonging to 255 genera and 80 families. In the absence of the project, abundance and richness of this flora species will be expected to decline due to this kaingin expansion, firewood gathering and charcoal making. The loss of the forest patches will also lead to the loss of seed-dispersing animals that would otherwise facilitate natural regeneration of forests; i.e., the loss not only of the contents, but also the self-restoring capacity of the natural environment. Globally threatened species (based on 2008 IUCN Red list of Threatened species) like *Vitex parviflora* (Molave), *Macaranga grandifolia* (Takip asin) , and *Pterocarpus indicus* (Narra) which were common to the area in the past will be exploited for timber and for firewood by the community and become rare.

For fauna, it will be expected that, due to continuous habitat destruction, forest-dependent species will decrease in richness. On the other hand, non-forest bird species (species that do not inhabit forested habitat and prefer grassland/open and disturbed areas) will increase in the absence of the project due to transformation from forest land to grass land. In the absence of the project, the exploitation of remaining wildlife will continue. Wildlife hunting for commercial and family consumption will contribute to the decline of species, such as Monitor Lizard, Philippine Warty Pig, Red Jungle Fowl and Philippine Deer in the absence of the project.

Gen	Clim	Comm	Bio
G3.		Required	

G3. Project Design and Goals

G3.1 Provide a summary of the project’s major climate, community and biodiversity objectives.

The overall goal of this project is to promote and achieve sustainability in forest conservation in the Peñablanca Protected Landscape and Seascape, and demonstrate the compatibility among multiple uses of forests – for biodiversity protection, watershed management, carbon sequestration and other ecosystem services for the benefit of the local communities. This will be achieved through a combination of 1) reforestation and enhancement planting of 1,800 hectares of degraded, open areas to promote habitat restoration for wildlife species and watershed rehabilitation to maintain ecosystem services such as prevention of soil erosion and clean environment using appropriate mix of indigenous forest tree species and fruit tree species which also provide a suitable habitat for many endemic species, 2) promotion of agroforestry to improve the cover and productivity of 700 hectares currently devoted to upland farming to enhance livelihood as well as biodiversity, and 3) community capacity building to ensure sustainability of the project after the initial funding ends. By increasing the forest cover through reforestation and agroforestry and undertaking forest protection and conservation awareness, the project contributes to carbon sequestration and avoidance of carbon emission while enhancing the soil and water holding capacity of the watershed to support improvements of farm production of local communities. Table 7 summarizes the project objectives and climate, community, and biodiversity benefits.

Table 7. Summary of project objectives and climate, community and biodiversity benefits.

Project Objective	Activity	Climate Benefit	Community Benefit	Biodiversity Benefit
Revegetate and/or reforest degraded, open grasslands and shrublands (1,330 hectares)	+Nursery seedling production +Tree planting +Plantation development, maintenance, and protection +Forest patrolling +Protection against grassfires	+Positive net change of GHG emission +CO2 emission avoidance	+Improved, restored watershed +Reduced soil erosion +Regulated streamflow	+Connecting fragmented/patches of forest +Improved habitat for wildlife +Increased population of wildlife +Protected endemic and threatened wildlife
Provide alternative livelihood (1,000 families)	+Agroforestry in upland farm development +Skills training	+Positive net change of GHG emission +CO2 emission avoidance +CO2 leakage avoidance	+Increased family income of project participants (agroforestry income of <P20,000 doubled at year 6) +Reduced soil erosion/improved, conserved soil fertility for increased farm production	+Improved habitat +Reduced forest fragmentation
Promote active participation of communities for	+ Conservation awareness raising campaign	+Positive net change of GHG emission	+Protected and conserved natural resource base for socio-economic	+Connecting fragmented/patches of forest

Project Objective	Activity	Climate Benefit	Community Benefit	Biodiversity Benefit
long term conservation	+ Capacity building, skills training +Forest protection	+CO2 emission avoidance +CO2 leakage avoidance	development of 5 local communities	+Improved habitat for wildlife +Increased population of wildlife +Protected endemic and threatened wildlife
Combating deforestation (no new cutting from the natural forest by project participants)	+Fuelwood plantation establishment	+CO2 emission and leakage avoidance	+Alternative sourcing of fuelwood +Conserved natural resource base of 5 communities	+Protection of remaining natural forest/ habitat
	+Promotion and use of efficient alternative cooking scheme [use of more efficient non-wood fueled cooking stove]	+CO2 emission and leakage avoidance +Waste recycling (e.g., rice hull)	+Alternative sourcing of fuelwood +Conserved natural resource base of 5 communities	+Protection of remaining natural forest/ habitat
	+Establishment of Reforestation Fund	+Expanding CO2 sequestration capacity from expanded reforestation areas +Ensuring permanence of climate benefit	+Cooperativism promoted for efficient farm production and product marketing +Improved access to microfinancing	+Expanding habitat +Improving habitat conditions through connecting fragmented/patches of forest

G3.2 Describe each project activity with expected climate, community and biodiversity impacts and its relevance to achieving the project’s objectives.

The following describes the project activities under each objective as presented in G3.1.

Objective 1: Revegetate and or reforest around 1,800 hectares of degraded, open areas through a combination of reforestation and enhancement planting to promote habitat restoration and watershed rehabilitation through the use of appropriate mix of indigenous forest and fruit trees (Table 8).

Reforestation and enhancement planting components will be conducted with support from the Protected Area Superintendent (PASU) of PPLS and Local Government Unit (LGU) of Peñablanca. The establishment of nurseries, production of seedlings, planting the seedlings, and weeding, cleaning and maintaining the plantations will be done with the participation of communities involved. Technical training and supervision will be provided by CI, together with the PASU staff and DENR.

Major activities under this component include:

Preparatory Activities:

1. Community consultations, orientations and awareness campaign
2. Community planning to include the formulation of an action plan for the community to implement the project
3. Formulation and adoption of community agreements that clearly state the community's responsibility and commitment to protect and conserve the biodiversity of the park.

Nursery Establishment:

1. Orientation and training for the local community on nursery establishment and management
2. Identification of nursery site using the following criteria; a) available space, b) availability of water supply, and c) proximity to the planting site to avoid problems of seedling transport during planting
3. Establishment of the nursery to include the construction of a potting shed, fencing, construction of the nursery beds, watering system and nursery bunk house
4. Purchasing materials that include nursery farm tools, potting materials, and seeds
5. Seedling production to include collection of wildlings of indigenous species, seed germination, and seedlings care and maintenance.

Plantation Development:

1. Orientation and training for the local community on plantation development and management
2. Preparation of the planting site to include staking, clearing and brushing
3. Planting to include transport of seedlings from the nursery to the planting site
4. Plantation care and maintenance to include replanting, weeding and patrolling.

Nursery or seedling production and field planting are done in the first year of implementation. Maintenance and protection of the target site are required immediately thereafter, which consists of tending the plants, fertilizing, and weeding including the conduct of foot patrols, and setting up trails, firelines and a watch tower. Indigenous species particularly those present in the area are considered the majority species to be used in the plantation in order to maintain the biodiversity significance of the area especially since the area is a watershed. This restoration area will eventually interconnect with the main Sierra Madre mountain range where the natural forest is still intact.

The reforestation activities will be conducted with full participation of local communities. After sufficient consultation, the DENR-PAMB and CI Philippines will conclude a Memorandum of Agreement with each family-participant. Cash incentive is provided from the project funds for seedling plantation and maintenance. Information, Education and Communication (IEC) campaign and creation of a financial mechanism (Reforestation Fund) will be conducted to ensure sustainability of climate, community, and biodiversity benefits after the initial funding ends (to be described further below).

Objective 2: Provide alternative livelihoods for local communities within and adjacent to the project site through the promotion of agroforestry within 700 hectares grasslands and shrublands areas (Table 8).

The strategy for the agroforestry component is to align this project with the existing agroforestry interventions conducted for a few existing associations of upland farmers in PPLS; this is to be done with the involvement of CI and others operating on the site, including the local LGUs. Marketing of their products and other technical support will come from CI, partner NGOs and LGUs. Activities involve the designing and implementing agroforestry farming technology appropriate to the configurations of the grasslands and shrublands, including existing kaingin (i.e., slash and burn) areas within the project site. It will be complemented by skills-development, capacity building for the participating farmers and local communities with the intention of showcasing agroforestry as a major alternative livelihood among the local communities within the protected area.

The mix of agricultural crops, fruit trees and forest tree species will be decided with the full participation of communities and farmers involved. Nonetheless, mango will be one of the fruit tree species to be planted given its robust growth in the area, preference of local upland farmers who have initially planted mango in their kaingin areas, and favorable market both local and overseas. A feasibility study to emphasize the marketing aspect will be undertaken to assess the full potential of mango as a major crop and its contribution to increasing the income of participating farmers and its impact to the economy of local communities.

Major activities to be undertaken under Agroforestry component:

1. Orientation and community consultations within the five barangays covered by the project in collaboration with the DENR-Protected Area Superintendent office, Protected Area Management Board and the Local Government Unit
2. Survey and mapping of individual family farms and suitable open areas for agro-forestry development within the project site
3. Community and/or farm planning for the individual lots to be subject for agro-forestry to design the appropriate mix of species and cropping pattern
4. Agro-forestry farm development for the individual lots—this include seedling production (both forest trees and fruit trees) and plantation development. However, purchase of fruit tree seedlings from available suppliers can be done especially those grafted fruit tree seedlings as it requires longer period in raising them
5. Skills training and other form of capacity building for the participating families
6. Feasibility study for the products that can be produced under this project for a long term support for the local communities

Forest tree species to be intermixed within the agro-forestry farms will be those for timber and charcoal production to further diversify and enhance the income sources of the family-participants and thus help reduce the threat of trees being cutting within the reforestation area. Like the reforestation component, a Memorandum of Agreement shall be executed with the participating individual families.

Table 8. Summary of the project components and area of coverage.

Project Component	Location	Phase 1* [ha]	Phase 2* [ha]	Total Area [ha]
Reforestation	All within forest lands (government-owned or public lands), planned for Reforestation under the Protected Area Management Plan; existing land cover include grasslands, shrublands, and former pastureland ; spatial planting as solid patch using mix of various suitable indigenous plant species.	912	418	1,330
Enhancement Planting	All within forest lands, planned for habitat rehabilitation under the Protected Area Management Plan; existing land cover includes patches of secondary forests	300	170	470
Agro-forestry	All within forest lands under Community Stewardship Contract (CSC) under the Integrated Social Forestry program of the DENR. Some areas fall outside of CSC sites; existing land cover include grasslands, shrublands, mixed/perennial crops, plantation crops, sub-marginal forests; spatial planting as solid patch using mix of various agro crops and fruit trees	560	140	700
	Mango Plantation. All within CSC and slash and burn farms within the project site; spatial planting as solid patch using mix of various agro crops and fruit trees	(400)	(0)	(400)
	Other Fruit Trees Plantation. All within CSC and slash and burn farms within the project site; spatial planting along lot boundaries as solid patch using mix of various agro crops and fruit trees	(60)	(120)	(180)
	Firewood Plantation. All within CSC and slash and burn farms within the project site; spatial planting along lot boundaries or solid patch depending on the desire of the community	(100)	(20)	(120)
Total Area (ha)		1,772	728	2,500

* Initial grant covers Phase 1. Implementation of Phase 2 is contingent on renewal of the project's grant agreement with the donor, based on the performance during Phase 1.

Objective 3: Promote active participation of nearby communities for long term forest maintenance and protection of the target site through conservation awareness building and skills-oriented trainings for livelihood development.

Environmental awareness campaign:

CI has launched an Information, Education and Communication (IEC) campaign to increase the level of awareness of local communities and generate their long term support for important benefits that well-maintained forests can provide—from improved watershed to enhanced agroforestry livelihood projects. The PASU and the local LGUs and organized youth groups will

lead this campaign as it is now being undertaken in PPLS with the support of CI and partner NGOs.

Major activities:

1. Community organizing, organizational development and institutional collaboration -- expertise for which CI has strong in-house capabilities
2. Conduct of information dissemination through community assemblies, lectures, local radio and TV program's using a combination of communication media such as posters, flyers, pamphlets, primers, video clips, information billboards which the project will produce in local dialect with as much local content as possible so that the target communities can readily relate with
3. Organization, training and provision of logistical support for local forest protection groups that will initiate forest protection and enforcement for both the project site and the protected area.

Forest Protection

The forest protection and law enforcement activities shall be spearheaded by the DENR-Protected Area Superintendent Office with the support of the locally organized and trained groups from the local communities within the protected area and the LGU.

Under the PPSRP, forest protection and law enforcement will be facilitated through 3 different but complementary levels or approaches. These are the following:

a. Protection by individual family participants under reforestation and agroforestry. In this approach, the project participants are the main entity responsible in the protection of the plantation areas as part of their obligation to prevent and/or control astray animals, grass fire and any untoward incident that may damage their farmlots or reforestation areas designated to them. Construction of fences on their agroforestry farms and construction of mini fire lines at the boundary of the reforestation areas are done by the family participants in accordance with the MOA signed between project participants and the project.

b. Protection jointly undertaken by community reforestation guards (Barangay Tanods, trained community members and barangay officials) and DENR staff. The community reforestation guards (CRGs) and DENR field staff will be deployed in the project site at any given time to enforce forest protection activities. The deployment of the CRGs will be done on a rotation basis. Logistic support such as food allowance and basic patrolling tools will be provided to each of the community forest guards and DENR patrolling team. This will be supported by A Memorandum of Agreement between CI and the Barangay Captain to define the roles and responsibilities of each party involved in accordance with the Memorandum of Understanding that was signed between CI, Peñablanca LGU and DENR. In order to be systematic and effective in conducting forest protection activities, look out towers will be put in place in strategically located within the project area. The look out tower is primarily to serve as vantage point to detect fire occurrence and to monitor people coming in and out of the reforestation areas and record their activities. Furthermore, the project will be providing fire fighting equipment such as large plastic drums for water storage, pails for fetching water and

back pack water sprayers. In addition to look out towers, a check points will be installed to be man by CRGs, DENR Forest Rangers and Barangay officials to monitor any movement of illegally transported forest products.

Protection through awareness campaign activities, local ordinances and resolutions by LGU Peñablanca.

Providing the right and timely information to the local communities helped to prevent and/or minimize the occurrence of fire and damage to the reforestation areas. The awareness campaign is done through various media such as community meetings, awareness campaign activities, and distribution of IEC materials such as posters, streamers and billboards pertaining to the project, its importance and fire prevention measures. Radio and TV program are also utilized to reach a wider audience. Local ordinances and Municipal resolutions also contributed to the protection of the reforestation areas. This resulted to the gradual decrease of number of astray animals within the project site and total removal of astray animals in the plating areas in Barangays Bugatay and Cabasan.

Complementary Intervention Support

This project envisions the implementation of other activities supportive to increasing the level of success of achieving project objectives, and for sustaining project initiatives in the long term. These activities include combating deforestation through the planting of various fruit trees particularly those high value species like Mango, Cacao, Coffee, etc. within the agro-forestry sites, and the establishment of a reforestation fund to sustain the management and possible expansion of the project.

Addressing the Driver of Deforestation and Forest Degradation

Wood is gathered for fuelwood and charcoal making by local families for their household cooking and for commercial sale, and these activities are a major driver of the decimation of forest cover in the project area. In addition to providing alternative livelihood to these families through the project components on agroforestry and reforestation to reduce, if not totally stop cutting of trees from the natural forest, the project will support project participants in the establishment within their agroforestry sites of designated sources for firewood/charcoal. This will be done through planting of species appropriate for firewood/charcoal and mainly for household use. The family-project participants can opt to group themselves for the establishment of a communal source instead of having individual sources. To further reduce firewood consumption, the Project will support the promotion of appropriate cooking technologies that involve the use of alternative cooking fuels such as rice hulls, non-wood charcoal briquettes, biogas, and cooking stove improvement with higher thermal efficiency.

Financial Mechanism for Sustainability: Reforestation Fund

As a sustainable financing mechanism to expand the reforestation area to cover other barangays later on—after the 6-year duration of this Toyota-funded project—and to serve the microfinancing and emergency needs of project participant-families, the project will assist to create and develop a Reforestation Fund. Its capitalization and build up will come from the mango harvest of agroforestry project participants. The mechanism of establishing and managing

this Fund will be patterned on existing community based funding mechanisms like Grameen Bank which was very successful in Bangladesh. Every project participant is encouraged to become a member of their organization or cooperative for this purpose. Draft guideline to govern member's responsibilities, benefits and fund uses or management has been formulated and will be finalized with the participation of project participants.

Conceptually, every member has to contribute or share a certain percent of its income derived from his mango harvest being supported by the project. These contributions will form the Reforestation Fund, with full accounting of each member's contribution to the Fund much like the usual bank deposit account. As the Fund grows, members can access the Fund to meet their financial needs, such as for livelihood/business and emergency medical cares. The Fund earns some reasonable interest in the process which can be declared later on as dividends to members, or to be plowed back as addition to their shares in the Fund. As members are able to access and benefit from the Fund, this situation will encourage them further to increase their contributions or shares to the Fund which makes it sustainable even to support efforts to further expand the reforestation to other barangays in such joint projects involving tree planting where the match funding comes from the Reforestation Fund.

The mango production in the Agroforestry component of the project can provide income to project participants before the initial funding ends in year 6 (2013). This projection is based on discussions with the concerned project participants and supported by the results of technical, marketing and financial analysis on mango production recently conducted by CI and Toyota. The agroforestry farmers can increase their income. The contribution to the Reforestation Fund at fixed percentage (to be determined) of their gross income from mango sale will enable the building up of the Fund. There are critical conditions that must be met to achieve them. They include the provision of production inputs (e.g., fertilizer) until year 6 of the project, planting mango seedlings in 10 m x 10 m spacing, and maintaining the farm-gate price of not lower than P25 per kilogram of mango fruit. The strengthening of the cooperatives which will handle the centralized fruit production, harvesting and marketing of their produce, including skills training on mango growing, are also recognized in the study as necessary towards the realization of the Reforestation Fund being a sustainable financing scheme beyond the initial funding support.

Joint Research and Development Component

The objective of the Joint Research and Development component is to study, monitor and assess the impact of the project activities to the biodiversity and watershed and contribution to socio-economic benefits accruing to local communities. Monitoring indicators and methods have been identified. The results of the monitoring are compiled into a report annually. Detailed methods are described in respective sections for monitoring in this document.

Project impact monitoring and evaluation will also involve documenting and sharing project implementation experiences, lessons and challenges in order to provide for local partners' capacity building efforts.

G3.3 Provide a map identifying the project location and boundaries of the project area(s), where the project activities will occur, of the project zone and of additional surrounding locations that are predicted to be impacted by project activities (e.g. through leakage).

Within the 2,943-hectare boundary, reforestation, enhancement planting and agroforestry activities will be performed for 2,500 hectares (Figure 10). These activities are the project's active interventions and target areas for each are shown in Table 9. Forest protection (e.g., fire prevention, reducing/eliminating logging from natural forest patches, and introduction of alternative cooking scheme) will cover the entire 2,943 hectares. Since the patches of forest will also receive protection, they will be considered for REDD.

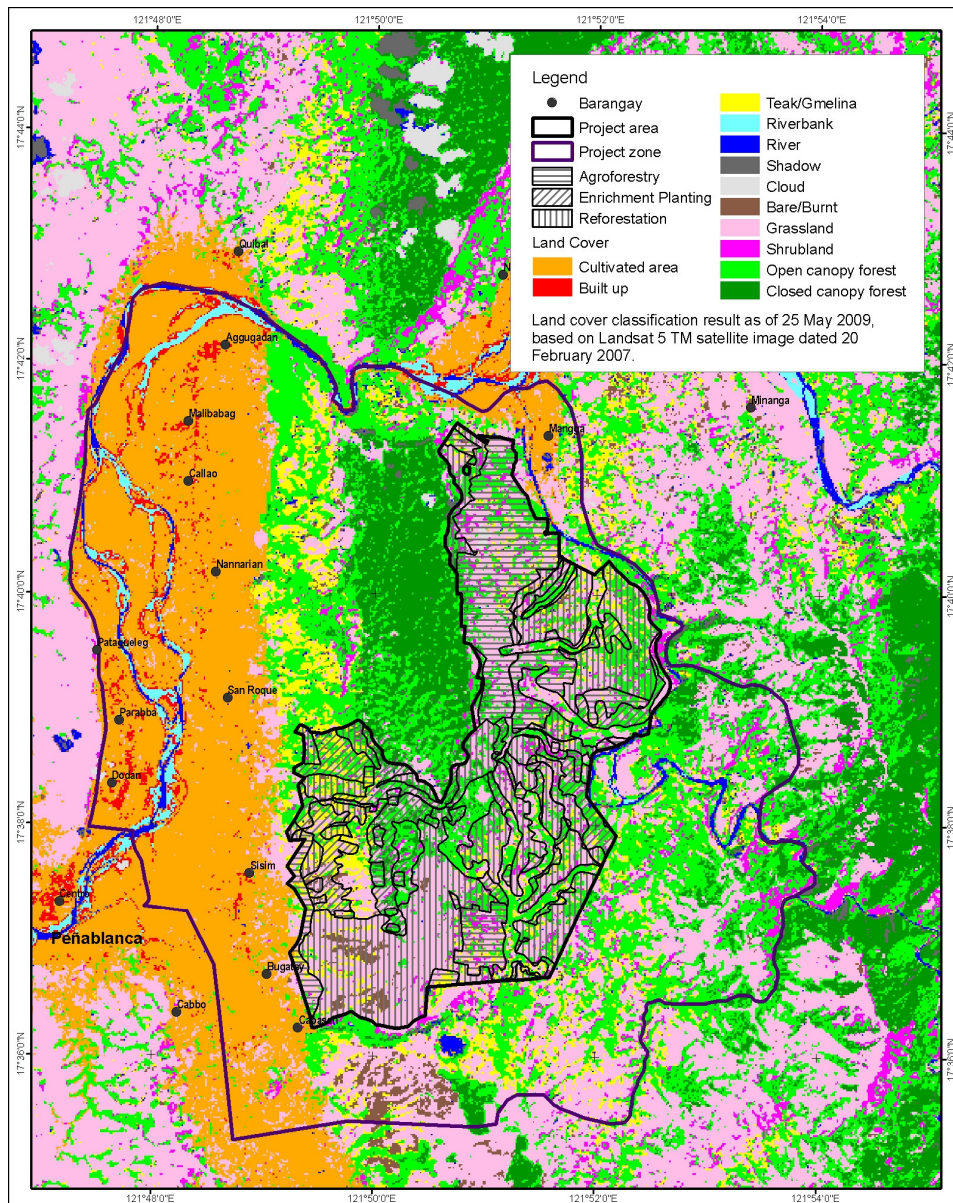


Figure 10. Map of project location and boundaries of project areas for reforestation, agroforestry and enhancement planting.

Table 9. Project area distribution by land use/cover and project intervention types (in ha).

Land Use/Cover	Total Within Project Area (2,943 ha)	Area for Active Intervention by Project Plan** (2,500 ha)				A/R-eligible Area within 2,500-ha			A/R Non-eligible Area within 2,500-ha, not for Forest Conservation	Forest Conservation (or REDD)	Area without Active Intervention
		Reforestation	Enhancement Planting	Agroforestry	Total within 2,500- ha	Reforestation***	Agroforestry	Total Eligible			
Bare/Burnt	71	52	7	5	64	59	4	63	1	0	7
Shrubland	196	73	20	69	162	87	62	149	13	0	34
Cultivated area	4	1	0	2	3	1	2	3	0	0	0
Grassland	1,298	703	125	340	1,167	798	315	1114	54	0	130
Open canopy forest*	924	321	206	205	732	0	0	0	0	924	0
Closed canopy forest*	87	23	29	15	67	0	0	0	0	87	0
Riverbank	9	3	3	1	6	0	0	0	6	0	2
Teak/Gmelina plantation	350	153	80	59	292	0	0	0	292	0	58
No data (cloud&shadow)	7	1	0	5	6	0	0	0	6	0	0
Total (ha)	2,943	1,330	470	700	2,501	945	384	1,329	372	1,011	231

*Forest as officially defined by DENR. The DENR Memorandum Circular No. 2005-005-Adopting Forestry Definitions Concerning Forest Cover/Land Use defines a forest as follows: "land with an area of more than 0.5 hectare and tree crown of more than 10 percent. The trees should be able to reach a minimum height of 5 meters at maturity in situ. Young natural stands and all plantations established for forestry purposes, which have yet to reach a crown density of more than 10 percent or tree height of 5 meters are included under forest."

** See Table 8.

*** Areas categorized for Enhancement Planting in the Project Plan that met the eligibility criteria for A/R have been merged with Reforestation.

(Source: Current land use/cover has been interpreted from Feb. 20, 2007 satellite imagery (LANDSAT) by CI Philippines)

Within the project areas, forest protection activities against occurrence of grassfires and detection of the presence of astray grazing animals require the putting up and manning of strategically located look-out towers and construction and maintenance of firelines. Signages have been installed to remind passers-by of the destructive effects of grassfires to the planted seedlings (see Figure 11 for the locations of look-out towers, firelines and signages).

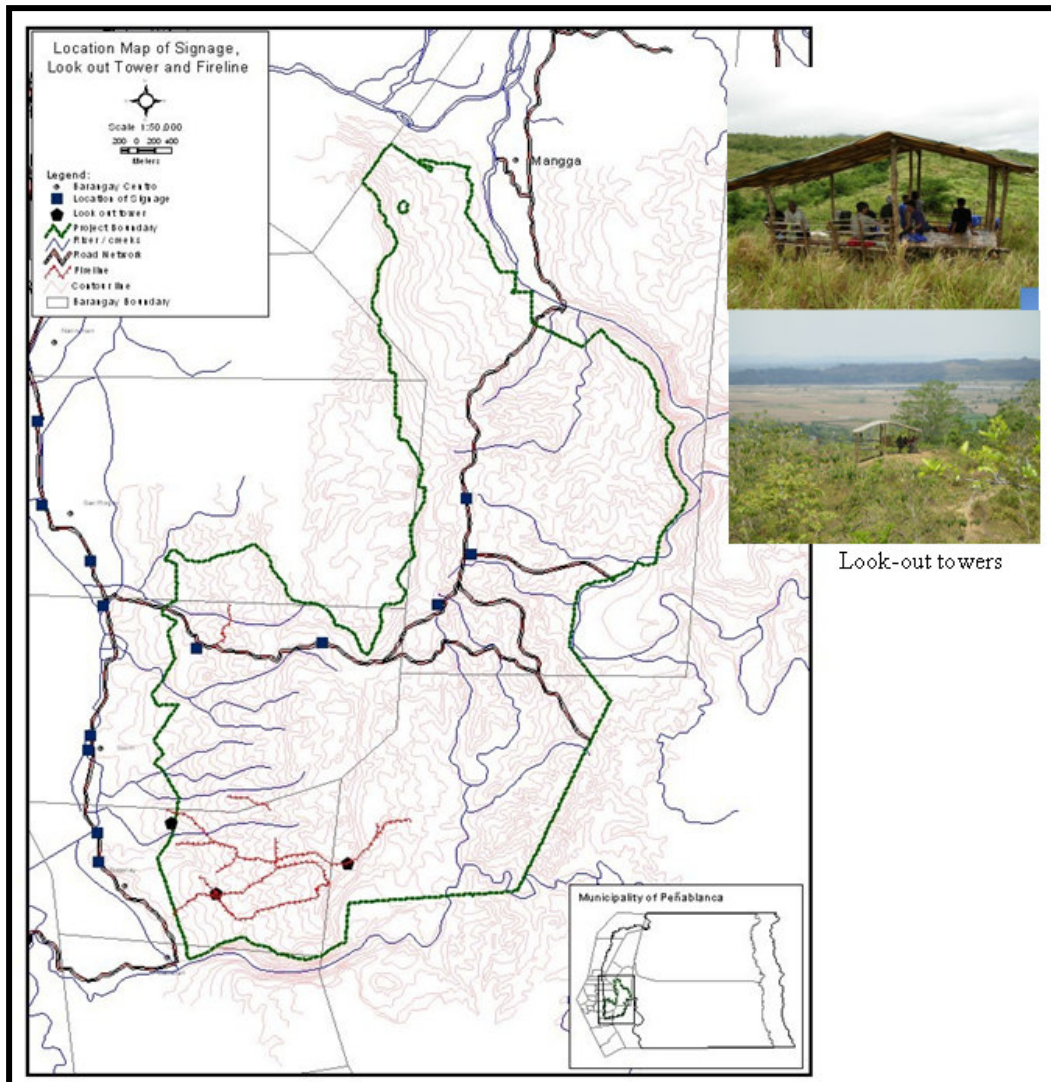


Figure 11. Locations of look-out towers, firelines and signages

The forest protection, such as halting logging from the project area, is accompanied by the provision of alternative fuel supply. Fuelwood demand will be lowered by introduction of stoves that uses rice hull, which are available in the area, instead of fuelwood or charcoal. The project will also support the establishment and management of fuelwood plantation, which can supply fuelwood without impacting natural forest patches. With these measures in place, the project does not expect any significant leakage will occur.

G3.4 Define the project lifetime and GHG accounting period and explain and justify any differences between them. Define an implementation schedule, indicating key dates and milestones in the project's development.

TMC and CI, with partners, intend to create sustainable reforestation institution or mechanism by the end of the Phase 2. Thus, the project lifetime is 2007-2013. Building of capacity and institutional arrangement sufficient to conduct the necessary activities (including on-the-ground

operations, marketing of various produces from agroforestry, and financial management) at the site level is one of the deliverables of the Philippine Peñablanca Sustainable Reforestation Project. Upon the completion of the Phase 2 of the project, the local bodies (namely, the cooperatives) will be fully empowered to implement the post-2013 activities. The cooperatives-led project will continue, so the GHG accounting period extends beyond 2013, and is defined to have a duration of 30 years.

The project is divided in two phases. The Phase 1 encompasses the first 3 years of the project which includes reforestation, agro-forestry and enhancement planting and monitoring activities with a target of 1,772 hectares from August 1, 2007 to July 31, 2010. The project will be comprehensively assessed at the end of Phase 1. The phase 2 will cover the second 3 years through 2013 with an additional target area of 728 hectares and increased capacity building.

By the end of the Phase 2 in 2013, the project will have created sustainability mechanisms and institutions such as the Reforestation Fund and the capacity of community beneficiaries as an organization to manage their agroforestry and reforestation areas for much longer term. The project partners, LGU and DENR, will be capacitated to carry on the responsibility of providing the needed technical and facilitation support. The first 6 years of the project is most appropriately considered as the development phase that has been designed to achieve long-term sustainability of the climate, community, and biodiversity benefits.

G3.5 Identify likely natural and human-induced risks to the expected climate, community and biodiversity benefits during the project lifetime and outline measures adopted to mitigate these risks.

Fuelwood demand

The trees that will be planted will be at risk of being harvested by the local communities and will hence preventing the project from attaining climate and biodiversity benefits. Currently, local communities are engaged in fuelwood gathering and charcoal making to meet their fuelwood needs and at the same time provide them with livelihood. To help mitigate this risk, the project will:

- 1) support the Project participants in the establishment of designated sources for firewood/charcoal and timber (targeting 120 hectares) and in enforcing agreed-upon rules. Forest tree species will also be intermixed within agroforestry farms for their wood production.
- 2) support the promotion of appropriate cooking technologies that involve the use of alternative fuels such as rice hulls, non-wood charcoal briquettes, biogas, and cooking stove improvement with higher thermal efficiency.

Lack of knowledge

Since most people prioritize short-term benefits, the lack of knowledge on long-term direct and indirect benefits will lead to non-cooperation. The community will need to understand the benefits of increasing forest cover, improving farming practices and long term benefits of biodiversity as well as impact of unsustainable farming practices.

To promote active participation of local communities for long term maintenance and protection of the reforestation and agroforestry sites, information, education communication (IEC) activities will be undertaken. This will involve series of consultation meetings with the local communities. The key message to be conveyed to the local communities is not only that well maintained forests can provide the improved watershed protection but also that agroforestry revenue can contribute to enhancing livelihood, with their own families and their local communities as direct beneficiaries.

Grassfires and illegal activities

In addition to IEC, forest protection and law enforcement activities will be undertaken to ensure protection of the reforestation area from grass fire, illegal fuelwood gathering, illegal grazing and charcoal making. These activities will be spearheaded by the DENR-Protected Area Superintendent Office (PASU) with the support of the locally organized and trained groups from the local communities within the protected area and the LGU.

A feasibility study for mango marketing has been conducted to devise marketing and production strategies. Likewise, other technical support will be provided to the local communities which include the design and implementation of agroforestry farming technology appropriate to the configurations of the grasslands and shrublands, including existing kaingin areas within the project site. Also, CI together with the partner NGOs and LGUs will assist the local communities in marketing their agroforestry farm products to enable them to realize additional income for their families. Such additional income generated will help prevent clearing of more forest areas in favor of upland agriculture.

Other than the project's main focus on investing in reforestation and agroforestry, complementary support from the LGU is needed to scale up improvements in the agriculture sector since agriculture is the primary income source of more than 50% of households. Enhancing the participation of the Local Government Units to the project site by channeling projects and programs of the government increases the livelihood opportunities of the local community in the project site. Use of government projects/programs will increase the access to other technologies that can improve their farming practices and enhance land productivity. These lead to increase in income by the family and could lessen their dependence to natural forest for their basic needs such as fuel and charcoal.

Grazing astray animals

Damage to young seedlings through trampling and grazing by astray animals is a serious threat to successful reforestation. Elimination of astray animals will be addressed through community patrolling, enforcement of community ordinances banning astray animals within the project site, and facilitation support to the owners of the animals to transfer their animals to other legitimate pasture areas outside of the project.

Site preparation and weeding

Site preparation will disturb the vegetation and soil in the planting sites. However, the method that will be employed will have minor negative impacts on the soil, soil erosion and original vegetation. Instead of the usual method of burning vegetation and overall tillage which contribute to CO₂ leakage, non-tree vegetation will be slashed manually and piled on site to clear

a 1-meter diameter around the planting hole. Hole with a diameter and depth twice the size of the seedling pot will be dug for tree planting. Also, manual weeding around the planted seedling within the 1-meter diameter will be regularly undertaken to control regrowth of any competing plants and help ensure the survival and growth of the planted seedling.

Fertilization and chemical use

Organic fertilizer instead of compound synthetic fertilizer will be applied within the small planting holes rather than overall dispersing, so that the potential risk of the fertilization application as run-off and polluting the water can be minimized.

Improper pesticide and fungicide application would be harmful to the natural environment, including polluting soil, water and air conditions, and may have a negative impact on the wildlife. The key is on prevention and early detection of pest and disease. This will be addressed through technical and awareness training to local farmers/communities on strengthening early detection through monitoring that will be initiated by project participants and local community members. A mixed species planting, rather than monocultures in agroforestry will be adopted to further reduce pest and disease risks, including seed and seedling quarantine to minimize the need for artificial pest and disease control. Use of organic pesticides and biological measures will also be employed to control pests and diseases as part of the promotion of integrated pest management among project participants.

None of these risks and/or negative impacts is considered to be significant.

G3.6 Demonstrate that the project design includes specific measures to ensure the maintenance or enhancement of the high conservation value attributes identified in **G1** consistent with the precautionary principle.

HCVs have been identified under the following two categories from the project zone.

Globally, regionally or nationally significant concentration of biodiversity values

The project recognizes the importance of restoring the degraded forest conditions of the project area and its vicinity. The project design includes planting of indigenous species (including some threatened species) of trees to enhance remaining patches of forest or reforest degraded habitats within the project area. The restored forests will improve forest habitat connectivity, which will result in facilitating the movement and dispersal of the endemic and threatened species of fauna. Reforestation activities are in line with the protected area management plan of PPLS, and are intended to restore the habitat conditions for the threatened species known from PPLS.

Areas that provide critical ecosystem services

Clean water from springs and wells has been identified as a critical ecosystem service. The role the project activities play is groundwater recharging. Landscape in which degraded, eroding areas are restored to forest and in which remaining natural patches of forest is conserved should contribute to maintaining and enhancing this ecosystem service. Many patches of forest remain on steep slopes along creeks. They serve as riparian buffer that reduces soil flowing into the river system. Protecting them under the project, therefore, will contribute to clean water as well. The

project regularly monitor springs during dry season and groundwater levels in wells as indicator of changes in groundwater conditions.

As a result, the project even enhances the high conservation value attributes of the project site for biodiversity and environmental services for water.

G3.7 Describe the measures that will be taken to maintain and enhance the climate, community and biodiversity benefits beyond the project lifetime.

The climate and biodiversity benefits will be maintained, and enhanced with time, by maintaining the plantations developed by the project supported by the initial funding. Development to sustain community benefit addresses maintaining plantations and protecting existing natural forest patches.

The project focuses on forest restoration while ensuring that the target communities will have sustainable alternative livelihoods which lessens their dependence on the existing natural forest in order to ensure the permanence of the restored forest and the remaining natural forest within the project site over the long term. The pressure on remaining natural forest will be reduced by adopting cooking stoves that do not use wood for fuel, and by supplying fuelwood from fuelwood plantations the project develops, and communities maintain, in strategically-selected, designated areas outside the natural forest (G3.1).

The project engages in further measures to ensure sustainability; they include conservation awareness raising campaign, organizational capacity building for the communities' cooperatives, and the establishment of the Reforestation Fund. Effort by the project is to strengthen the institutional sustainability of the cooperatives with the support of various government entities and NGOs.

Reforestation Fund is a financial mechanism that ensures sustainability of the project impacts after the funding from TMC ends in 2013. Mango agroforestry whose establishment is supported by the project is designed to generate funds for the Reforestation Fund. As the mango trees mature to produce fruit, certain fraction of its sale will be pooled in the Reforestation Fund, which will provide funds for the following three purposes, in the order of priority (Figure 12):

- 1) Maintenance of existing plantations;
- 2) Establishment of new reforestation sites; and
- 3) Livelihood support.

With this Fund, the plantations established by 2013, totaling 1,800 ha (1,330 ha for reforestation and 470 ha for enhancement planting under the project plan as in Table 8; note this area includes all A/R Areas and additional areas not eligible by A/R CDM methodology), will receive proper maintenance. With time, the mango fruit production will increase, and the Reforestation Fund will be able to finance additional reforestation activities and microfinancing to support local livelihood.

The Reforestation Fund will be managed by cooperatives, a membership organization of local farmers. There are four cooperatives in the five barangays involved in the project, three of which

have been established as a result of the project. The project has conducted series of capacity building activities, including credit orientation seminar, pre-membership education seminar, leadership training and bookkeeping seminar. The detailed planning for cooperatives' business has been initiated, and the planning will be completed and cooperatives and Reforestation Fund will be operationalized during the second phase of the project (2010-2013).

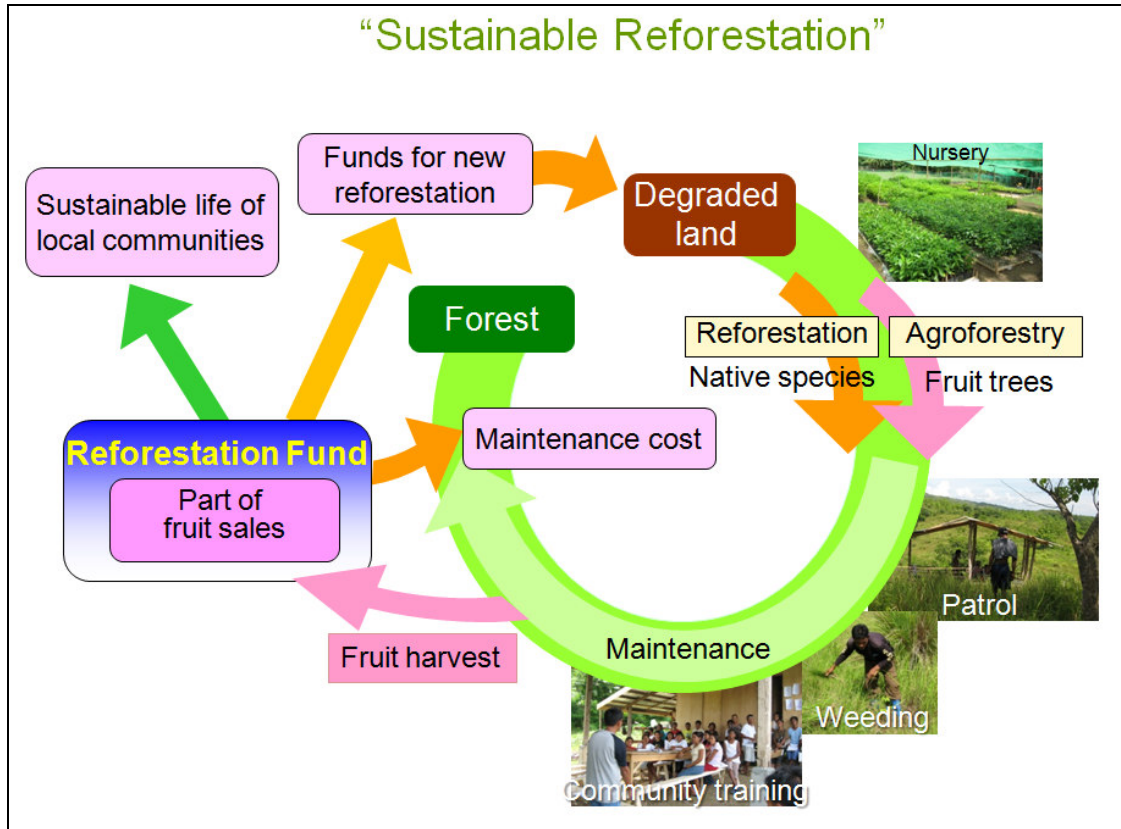


Figure 12. Conceptual diagram of the Reforestation Fund as the project's sustainability mechanism.

G3.8 Document and defend how communities and other stakeholders potentially affected by the project activities have been identified and have been involved in project design through effective consultation, particularly with a view to optimizing community and stakeholder benefits, respecting local customs and values and maintaining high conservation values. Project developers must document stakeholder dialogues and indicate if and how the project proposal was revised based on such input. A plan must be developed to continue communication and consultation between project managers and all community groups about the project and its impacts to facilitate adaptive management throughout the life of the project.

Definition and identification of communities and other stakeholders

Project local stakeholders consist of two groups: the individual and organization stakeholders. The individual stakeholders are residents of the five barangays within the project boundary who signified their intention to directly participate in implementing project activities in reforestation, enhancement planting and agroforestry. They include the family participants of reforestation and enhancement planting, the upland farmers in developing their farms into agroforestry, those who

are hired by the project for specific activities like watering in the nursery, fireline construction in the reforestation areas, those who provide their seedlings to the project, and those who perform patrolling as forest guards and are given food allowance as project support. They are the beneficiaries of the project.

The organization stakeholders are primarily the mandated institutions which have jurisdiction over the project site. They are the project partners. Since they also benefit from project's outcomes, they can provide facilitation and support to the project. These institutions include the local government units (LGU) of the municipality of Peñablanca and the 5 barangays, the local offices of Department of Environment and Natural Resources (DENR), and the Protected Area Management Board (PAMB)-Protected Area Superintendent Office (PASU) of PPLS. DENR, LGU, Toyota Motor Corporation, and CI are signatory to the Memorandum of Understanding of the project.

Through group meetings, community assemblies and information dissemination campaign, all the identified local stakeholders have been informed and are continuously being encouraged to actively participate in project planning, implementation and providing feedback. For new or additional local stakeholders that may emerge as the project develops, they will likewise be informed and their participation sought.

Year-end Meeting as a venue

The year-end meetings, annual progress report meetings, are the most formal venue to share information on activities during the past year. From the 2008 meeting (held on August 3, 2008), the meeting is held locally in Tuguegarao City to encourage more local participation to the meeting. All organization stakeholders are present at the year-end meetings.

Local stakeholder participation in the project's planning

Needs assessment, project introduction, participatory planning and implementation of project components have been ensured through formal and informal meetings and consultations. MOAs were drafted and finalized in participatory processes between Family Participants and implementing agencies appropriately across levels (sub-grantee non-government organizations, local government units, Department of Environment and Natural Resources, and CI-Philippines).

- Farmers who are also users of tenured and open access areas for forestry activities were identified in surveys, validated in community assemblies, and involved in project planning up to and including implementation with monitoring and enforcements tasks. For each Family Participant, members of the household are involved in reforestation, agroforestry, the reduction of fuelwood cutting from the native forest and testing of alternative cooking scheme.
- The local government units as implementing partners are formally directing the participation of households and coordinating with the DENR for Protected Area concerns, with mandated units at the legislative level (for supportive local ordinances), in environment protection (enforcement and monitoring as forest guards) and agriculture (for socio-economic components).

- Women are involved as upland farmers and family participant in agroforestry, reforestation and rice-hull stoves to reduce fuelwood and use of charcoal from the native forest.
- For the rice hull-stove, the barangay council was given the task to identify and select recipients among the Family Participants and upland farmers in the reforestation and agro-forestry components.
- With the acculturated indigenous peoples as the majority in most of the project sites, their rights, interests and values are centrally addressed in the design and implementation of the project.

Stakeholders' inputs to project design

Prior to the project implementation, the project concept was discussed within the Protected Area Management Board, Local Government Units at the municipal, provincial, regional level and communities in the covered barangays to generate support and inputs for the project. This was done during the initial visit of the donor. Project implementation framework in the project design was changed as a result of the inputs from various stakeholders during consultations. All concerns of local communities in the project implementation were discussed in each barangay during barangay council meetings and assemblies.

Identification and establishment of agro-forestry and reforestation areas was consulted with land owners and DENR. The major criteria used to identify which areas were to be reforested include existing vegetation, current land use, land tenure, and accessibility.

Detailed items discussed when engaging households included expectations for the roles of Family Participants and upland farmers, how households and supervising agencies would be held accountable, the mechanics of implementation and monitoring, and the net benefits and support mechanisms the project would implement. These were discussed incessantly in past community assemblies, meetings, and consultations as part of finalizing the MOA. During this process, the FPs expressed their desired outcomes which they expected in return for giving their commitment. Questions on terms of the MOA were clearly answered and formalized prior to signing. Beyond the MOA, subsequent consensus and additional agreements have been reached as project components were being operationalized.

Implementation of forest protection was also discussed with the DENR together with the local Government units at the barangay level, and involved the Barangay Tanod in the implementation of activities. Benefits and the kind of support were agreed by the stakeholders after a series of consultations and meetings.

Open and transparent management of the project with appropriate regular documentation assures participants that issues that may emerge in the future will be fairly and flexibly addressed by all implementing partners.

G3.9 Describe what specific steps have been taken, and communications methods used, to publicize the CCBA public comment period to communities and other stakeholders and to facilitate their submission of comments to CCBA. Project proponents must play an active role in distributing key project documents to affected communities and stakeholders and hold widely publicized information meetings in relevant local or regional languages.

The project plan and this PDD are the results of inputs generated from series of discussion-consultation-meetings with all the local stakeholders that include the local communities and local institutions like DENR and the Local Government Units of Peñablanca where the project is located. Therefore, stakeholders are already generally familiar with the project plan.

Conservation International Philippines will notify all the signatory partners to the MOU (i.e., DENR, LGU of Peñablanca), upon the publication of the PDD on the web by CCBA. Conservation International Philippines will also notify the same to each barangay captains of participating five barangays. The barangay captains will be requested to let individual Family Participants know of the opportunity to submit comments. The barangay captains will be provided with printed copies of the PDD, so that the document can be shared with those without ready internet access. Conservation International Philippines will also use the regular assembly with local participants (e.g., biweekly payment day) as a communication venue. Instructions will be given on how to submit comments online. The project staff will collect comments from those without internet access, English capability, or any other reasons that make them difficult to submit comments online, and report to CCBA on their behalf.

Toyota Motor Corporation will use its internal and external communication channels to encourage comment submission. Conservation International (through its Japan program, Philippine program, and Center for Environmental Leadership in Business (CELB)) will try to reach and encourage much wider interested audiences to participate in the public comment process.

G3.10 Formalize a clear process for handling unresolved conflicts and grievances that arise during project planning and implementation. The project design must include a process for hearing, responding to and resolving community and other stakeholder grievances within a reasonable time period. This grievance process must be publicized to communities and other stakeholders and must be managed by a third party or mediator to prevent any conflict of interest. Project management must attempt to resolve all reasonable grievances raised, and provide a written response to grievances within 30 days. Grievances and project responses must be documented.

Conflict at the Field Level

To expedite the resolution of conflicts arising at the field level, and as has been agreed upon with the five local communities involved in project implementation, all field level conflicts can be communicated directly to any nearest project staff who may already provide satisfactory resolution of the conflict. If the conflict is beyond the capacity of the field staff to resolve, the conflict will have to be communicated by the concerned project field staff to the Protected Area Associate in the field office at Cabasan (the Protected Area Associate), and to the Project Manager if need be. Always, the elements of expediency and resolution of the conflict to the full satisfaction of parties involved will be the key considerations.

If project staff is involved in the conflict, they can communicate through the concerned barangay officials/council led by the Barangay Captain who may initially hear and resolve the conflict at their level the soonest possible time, or within one week, following their established procedure of handling conflicts.

Handling Unresolved Conflicts

If the conflict is beyond their capacity or outside their authority as LGU to resolve, the Barangay Council will have to communicate to the municipal LGU who, in turn, submits the conflict to the appropriate body like the PPLS PAMB or the DENR local offices which has the sole authority to resolve conflicts involving issues affecting PPLS or the management of forestlands and utilization of forest resources in the project site.

Similarly, if the conflict is beyond the Project staff/Manager capacity or authority to resolve, the Project will have to seek the appropriate body to hear and resolve the conflict or grievance.

In practice, most community conflicts and grievances will be handled in more casual manner. Project staff members are on site, hence very accessible to partners if there are grievances that may arise. The Project manager upon receiving reports shall immediately (within the week) initiate validation, clarification, and resolution of differences.

Actual Examples

Two examples illustrate the above. The first example is on the grievance of family participants in reforestation against owners of astray animals that grazed to destroy the seedlings they planted. Together with PPLS Protected Area Superintendent, the project communicated this situation to the concerned barangay officials who made resolutions with the support of the municipal LGU (the Mayor); the DENR local offices further supported the resolutions by issuing complementing instructions to the animal owners. Initially, however, the Barangay Captains together with the DENR discussed this issue with cattle owners, including the possibility of identifying communal pasture areas within the barangays to where they transfer their cattle. This approach was not effective or not possible in the barangays as some of the owners are not permanent residents of the barangays. The DENR sent a letter to the owners informing them to remove their cattle in the project area as these are illegal but they were given ample time to do so. For some cattle owners who did not comply or having a hard time looking for alternative areas for grazing, they are sent a letter of invitation by the DENR and LGU exploring further some alternatives to ensure that they understand the importance of transferring their cattle. However, after such steps and warnings are given and owners still do not comply, DENR will then take appropriate actions against them based on forestry laws.

Another example is on intentional grassfire incidences that occurred in the project area. The causes of the grassfires were investigated immediately after extinguishing, by CI field staff together with the Protected Area Superintendent and DENR Forest Rangers. As part of the investigation field reports were submitted to the Local Government Unit and DENR Office. These reports were followed by a request for a meeting to discuss the incidences. Based on the field reports, the LGU and DENR regional office conducted further investigation. In response to the results of investigation, the LGU passed a resolution to provide guidance on the necessary

steps and penalties if perpetrators of such activities are caught. The municipal resolution was eventually adopted by the 5 barangays through their issuance of their respective barangay ordinances. This will provide a legal legitimacy for actions against intentional grassfires. However, in practice, in consideration that perpetrators will most likely be residents of local communities, the team of LGU, DENR and CI will have a meeting with the perpetrator and discuss the possible mitigation instead of filing legal case against the perpetrators. This way, we are able to educate the family and encourage them to be involved in the project as the project offers several ways for the community to participate and be benefited.

It has been the working ethics of CI staff to level off and be clear with the intention of the project and be transparent in order to secure the full participation of the local communities they work with, without which project implementation will be a sure failure.

G3.11 Demonstrate that financial mechanisms adopted, including projected revenues from emissions reductions and other sources, are likely to provide an adequate flow of funds for project implementation and to achieve the anticipated climate, community and biodiversity benefits.

The grant fund from TMC is adequate to support the conduct of activities to meet all planned targets during the first six years (though 2013). Beyond the grant fund period, project initiatives covering the agroforestry and reforestation areas will be maintained through the cooperatives—who shall have obtained the appropriate land tenure (the PACBRMA) to manage these areas using the Reforestation Fund.

The Reforestation Fund has been patterned after the sustainable financial mechanism practiced in a reforestation project of TMC in China. In short, the revenue from mango fruit sales from project's agroforestry activities generates funds, pooled in the Reforestation Fund, which provides funds for 1) maintenance of existing plantations; 2) establishment and maintenance of new plantations in adjacent areas (reforestation expansion); 3) micro-financing project. The operational and management cost of the Fund itself will also be covered by the Fund.

The key to success of Reforestation Fund is a high and steady production of mangos. Measures have been taken to optimize mango production and to command better market prices. High quality, asexually-propagated mango seedlings are procured from government-accredited suppliers. Participating farmers have been trained on appropriate horticultural practices for mango (and other fruit) production. It is anticipated that good quality mango seedlings under proper care will start producing fruit in the fourth year from planting.

The cost for plantation maintenance is PhP500/ha/year, estimated from DENR costing. The existing plantations to be maintained encompass 1,800 ha (1,330 ha for reforestation and 470 ha for enhancement planting under the project plan as in Table 8; note this area includes all A/R Areas and additional areas not eligible by A/R CDM methodology). Thus, the total sum of funds needed for plantation maintenance will be PhP900,000 annually. This is a fixed cost the Reforestation Fund must provide each year to ensure sustaining the project's climate and biodiversity benefits directly and community benefit indirectly. A comparison to Table 10 demonstrates that the Reforestation Fund should gain financial capability to fulfill this

responsibility by the end of the TMC funding in 2013. As the mango production increase with time, the Reforestation Fund will increase its financial capability to expand plantation and livelihood support.

The project will explore various options to diversify the income source of the Reforestation Fund to further increase the financial robustness of the Reforestation Fund in Phase 2 (2010-2013). In consultation with and active participation by the local communities, other agroforestry produces, such as cacao (which the project also provide seedlings for), may be incorporated into the scheme of Reforestation Fund. Carbon marketing is another potential option for sustainable financing. The project partners will carefully study how the carbon marketing may contribute to securing and increasing community benefits as part of Phase 2 activities.

Table 10. Financial projection for Reforestation Fund, based on the mango price of PhP25/kg

Project year	Calendar year	Contributions from:			Total Reforestation Fund [P]
		Mango planted in YR1 [P] (7138 trees)	Mango planted in YR2 [P] (6869 trees)	Mango planted in YR3 [P] (23100 trees)	
1	2007	--	--	--	--
2	2008	--	--	--	--
3	2009	--	--	--	--
4	2010	130,679	--	--	130,679
5	2011	294,027	122,661	--	416,688
6	2012	588,054	275,987	412,500	1,276,540
7	2013	784,071	551,973	928,125	2,264,170
8	2014	1,176,107	735,964	1,856,250	3,768,321
9	2015	1,568,143	1,103,946	2,475,000	5,147,089
10	2016	1,960,179	1,471,929	3,712,500	7,144,607
11	2017	2,352,214	1,839,911	4,950,000	9,142,125
12	2018	2,744,250	2,207,893	6,187,500	11,139,643
13	2019	3,136,286	2,575,875	7,425,000	13,137,161
14	2020	3,528,321	2,943,857	8,662,500	15,134,679
15	2021	3,920,357	3,311,839	9,900,000	17,132,196

Gen	Clim	Comm	Bio
G4.		Required	

G4. Management Capacity and Best Practices

G4.1 Identify a single project proponent which is responsible for the project's design and implementation. If multiple organizations or individuals are involved in the project's development and implementation the governance structure, roles and responsibilities of each of the organizations or individuals involved must also be described.

Lead implementer: Conservation International Philippines

Conservation International (CI) has been providing support in the last 10 years for the rehabilitation of forests within the Sierra Madre Biodiversity Corridor (SMBC), focusing on the forests of three protected areas namely: the Peñablanca Protected Landscape and Seascape, Northern Sierra Madre Natural Park, and Quirino Protected Landscape, to restore the habitat and ecosystem services that will have positive impact on local climate, biodiversity and the communities. The SMBC Program Manager is responsible for the project execution and is supported by 13 technical staff in the execution of different project activities.

Oversight and policy and technical support will be provided by the office of the Country Executive Director and other technical units within CI Philippines. CI Philippines technical staff has rich experiences in community organizing, reforestation and agro-forestry projects and activities. It also has its own expertise on land use management and land use change analysis and has high levels of experience in protected area establishment and management.

Furthermore, the project team will also be receiving additional technical, managerial and coordination assistance from CI branch offices, including the CI-Headquarters Office in Arlington, Virginia (USA) and CI-Japan. Conservation International has been implementing similar projects around the world, and experiences are shared within the organization through visits and discussions. List of forest carbon projects that CI implements around the world can be found at: <http://www.conservation.org/learn/forests/Pages/projects.aspx>.

The lead implementer has concluded a memorandum of understanding (MOU) with each of the key institutional partners: DENR Region 02 and its units, including the PPLS PAMB/PASU, and LGU Peñablanca. Their support and involvement in the project are specified in the MOU.

Roles of the lead implementer and its partners

Conservation International:

- Provide the overall coordination and monitoring of the project implementation and ensures that all planted indigenous species and fruit trees have high survival rate with a minimum of 80% survival rate.
- Promotes the total participation of the community in project implementation, particularly the upland farmers who will be directly involved in the agro-forestry project in the development and establishment of the "Reforestation Fund" to sustain and expand the project in adjacent barangays and ensures that community approach is employed in reforestation, whereby families will be given areas to plant including the plantation care and maintenance (See MOA on Family Participant for details).
- Conduct regular monitoring, consultations and meetings in collaboration with the key players of the project to ensure that implementation will proceed as planned.

- Assess project impacts on biodiversity and the socio-economic conditions of local communities together with the TOYOTA Motor Corporation of Japan—the project fund donor-- through a joint research and development component of the project.

Toyota Motor Corporation, as the donor and as a project partner:

- Provides funds to the project
- Jointly conduct research and development activities
- Technically contribute to project progress management and improvement

Department of Environment and Natural Resources (DENR)/PPLS Protected Area Management Board-Protected Area Superintendent, as a project partner:

- Provide support and technical assistance for the delineation and demarcation of the designated reforestation and agro-forestry area to be planted and ensure that the reforestation/restoration activities are consistent with the protected area Management Plan and other policies related to PA management. They also spearhead the forest protection activities within the protected area.
- Provide such other available support to the Parties and other Project stakeholders to help ensure the smooth implementation of the project, including the monitoring and evaluation of compliance by Parties with their responsibilities.

Local Government Unit of Peñablanca, as a project partner:

- As project partner, provide additional counterpart and project implementation support in line with the development plan of Peñablanca including support to IEC efforts, capacity building, livelihood, infrastructure and other complementing services for the benefit of community residents.
- Provide support for obtaining and maintaining any approvals including Resolutions and Ordinances that may be necessary and/or convenient from the project stakeholders for the implementation and sustainability of the project.

G4.2 Document key technical skills that will be required to implement the project successfully, including community engagement, biodiversity assessment and carbon measurement and monitoring skills. Document the management team's expertise and prior experience implementing land management projects at the scale of this project. If relevant experience is lacking, the proponents must either demonstrate how other organizations will be partnered with to support the project or have a recruitment strategy to fill the gaps.

Key technical staff of CI and partners from DENR and LGU cover all the necessary skills needed to implement this project, starting from community mobilization, site delineation/surveying, species-site suitability assessment, to seedling production until plantation establishment, development, maintenance and protection, and project monitoring and impact assessment. The project implementer and its partners have been involved in related activities for many years, own related techniques and accumulated rich experiences over more than 20 years. Additional technical support though is needed in relation to carbon accounting—which expertise will come from ICRAF which has been the partner of CI as to sharing of technical expertise in this aspect.

Conservation International has been implementing similar projects around the world, and these experiences are being shared within the organization through visits and discussions to share knowledge in different countries. Examples of CI's forest carbon projects may be found: <http://www.conservation.org/learn/forests/Pages/projects.aspx>. In addition, CI main headquarter and CI-Japan are providing management and technical support to the local project team.

Locally its pool of technical staff has rich experiences in community organizing, reforestation and agro-forestry projects and activities. It has also its own expertise on land use management and land use change analysis unit and has high levels of experience in protected area establishment and management.

The local program team of CI based in Tuguegarao City has been implementing similar reforestation, agroforestry and community development project in Quirino Protected Landscape (QPL) in northern Luzon Island (please see for reference: <http://www.conservation.org/Documents/Forest%20Carbon%20Projects.pdf> , page 8). This Quirino project is also seeking CCB validation within 2009.

The Department of Environment and Natural Resources (DENR), the project's major partner, have organized and implemented a number of national, regional and local forestry projects, also accumulating rich experience in coordinating and/or implementing reforestation and agro-forestry projects (see table 11).

Table 11. List of Positions and required skills for the PPSRP implementation.

Positions	Qualifications/Required Skills	Duties and Responsibilities
CI Project Staff		
Forestry & Carbon Project Manager	Candidate must at least hold a master's degree in forestry/agriculture/environmental Science or any related course. Must have a minimum of ten (10) years experience in related field. Preferably a supervisor specializing in forestry development and carbon-related projects. Expertise in project development planning, project proposal and feasibility study preparation.	<ul style="list-style-type: none"> • Manage, direct, control and supervise over-all implementation of the PPSRP. • Act as point person of the funding entity and other project partners in terms of project deliverables, protocols and other external affairs. • Provide linkages and networks to stakeholders both local and foreign.
Protected Area Associate	Must be a degree holder in Forestry/Agriculture or its equivalence, with three (3) years working experience in community-based environmental projects, good communication and writing skills and able to establish rapport with the community.	<ul style="list-style-type: none"> • Act as PPSRP overseer of all components in terms of activities and project operations. • Ensures smooth implementation of project goals, plans and targets including its commitment to other stakeholders.
Biologist	Must be a graduate in Biology, Forestry or its equivalence. Gained substantive skills and experience on biological research for	<ul style="list-style-type: none"> • Spearhead the technical support to biodiversity field monitoring research and awareness

Positions	Qualifications/Required Skills	Duties and Responsibilities
	both flora and fauna and other research work.	<p>campaign on biodiversity conservation under CI-TMC Joint Research and Development.</p> <ul style="list-style-type: none"> Facilitate biological survey of critically endangered, rare, vulnerable, threatened and abundance of fauna in the PPSRP sites.
Botanist	Acquired degree in Botany, Forestry and other environment-related course. Expert in tree taxonomy and physiological characteristics of indigenous trees.	<ul style="list-style-type: none"> Provide technical support on biological, taxonomical, physiological and ecological characteristics of indigenous trees.
GIS Associate	Must have earned a degree in Information Technology or computer science. Acquired knowledge in GIS software.	<ul style="list-style-type: none"> Generate thematic maps needed in planning, implementing and monitoring of the PPSRP operations.
Cooperative Development Coordinator	Must be graduate in Cooperative Development/Must have at least 5 years relevant experience in cooperative enterprise development, community organizing and microfinancing.	<ul style="list-style-type: none"> Facilitate, promote and monitor all cooperative-related activities like planning, meetings, consultations, training and workshops for the capacity building of the 4 cooperative.
IEC Assistant	Must be a graduate in Development Communication/ Environmental Science or other related fields and gained relevant experience in community organizing and possess excellent oral, written and analytical skills in preparing technical reports and correspondences.	<ul style="list-style-type: none"> Facilitate over-all awareness campaign on project goals and objectives including biodiversity conservation. Spearhead the conduct of community organizing, project consultations, trainings and seminars.
Technical Assistant for Reforestation	Earned bachelor's degree in Forestry/Agriculture or any related course. Acquired skills in the different technical aspect in the establishment of plantation starting from seed/seedling collection, nursery establishment, outplanting, protection, care and maintenance.	<ul style="list-style-type: none"> Spearhead the over-all implementation of reforestation and enhancement planting component of the PPSRP. Supervise, record and monitor reforestation activities and ensure compliance to standard cultural practices in the establishment of reforestation and enhancement planting. Facilitate community organizing and conduct of relevant trainings on nursery establishment, silvicultural practices, plantation care and maintenance and

Positions	Qualifications/Required Skills	Duties and Responsibilities
		integrated pest management.
Technical Assistant for Agroforestry	Must have earned a degree in Agroforestry/ Forestry/ Agriculture or its equivalent. Acquired skills in agroforestry techniques and other sustainable farming systems, gained adequate knowledge and skills in mango production.	<ul style="list-style-type: none"> • Spearhead over-all implementation of agroforestry component of the PPSRP and ensure standard compliance on the technical aspect on mango production. • Facilitate community organizing and trainings for agroforestry participants .
Field Assistant for Nursery Operations and Protection	Must be a graduate in Forestry/ Agronomy/ Agriculture or its equivalent. Acquired knowledge in seed phenology, silvicultural practices and taxonomic characteristics of indigenous seedlings.	<ul style="list-style-type: none"> • In-charge of all nursery operations, care and maintenance of seedlings. • Ensures disposal of good quality seedlings for outplanting.
Field Assistant on Joint Research and Development	Must be a graduate in Forestry/Geology/ Soil Science or other related course. Possess skills on taxonomy of indigenous trees, gained adequate knowledge on biometry, hydrology and research designs.	<ul style="list-style-type: none"> • Initiate monitoring of growth survival of indigenous seedlings, watershed monitoring (extreme flow measurement, soil infiltration rate, soil sediments and downloading of data from rain gauge and weather station.
Field Assistant for Reforestation	Acquired knowledge in operating GPS gadgets, familiar with potential areas for reforestation and able to identify sources of wildlings	<ul style="list-style-type: none"> • Monitor and evaluate the establishment of plantation. • Facilitate blocking/survey of target reforestation area and enhancement planting.
Field Assistant for Administrative	Must have earned a degree in Financial Management and acquired relevant experience in financial record keeping and office management	<ul style="list-style-type: none"> • Facilitate all administrative concerns to include processing of payrolls, procurement of supplies & materials. • Take charge of all office concerns to include office protocol, inventory and safekeeping of equipment.
Nursery Caretaker	Must have gained experience in nursery establishment, seed propagation and care and maintenance.	<ul style="list-style-type: none"> • In-charge of nursery operations from seedling production, care and maintenance, hardening-off and safekeeping of nursery tools and equipment.

G4.3 Include a plan to provide orientation and training for the project's employees and relevant people from the communities with an objective of building locally useful skills and knowledge to increase local participation in project implementation. These capacity building efforts should target a wide range of people in the communities, including minority and underrepresented groups. Identify how training will be passed on to new workers when there is staff turnover, so that local capacity will not be lost.

Given that CI Philippines will not be eternally present in the project area and that the project has limited duration of being externally supported, both in funding and technical guidance, it is important that local communities are provided appropriate skills and knowledge to enable them to maintain and sustain project initiatives on their own. Hence a combination of classroom type and hands-on training are provided by the project as part of the sustainability plan. Among the capacity building plan being pursued are trainings on seedling production, nursery and plantation care and maintenance and cross-farm visits to successful agro-forestry areas are provided.

As a demonstration that the trainings were effectively transferred to the local community, the project is currently sourcing most of the indigenous species planting materials from the trained community themselves through their back yard nurseries. Purchasing the seedlings raised by the local community encourages them to learn more about raising various species of indigenous species. This is a good incentive for the community as the knowledge they gained can still be used by them even after the project lifetime as most of the reforestation activities in the country are now required to plant indigenous species creating a huge market demand for these kind of seedlings and thus can be a good source of additional income for them.

In addition, the project has established a reforestation area and agro-forestry model farms. The objective of these model farms is to show to the local communities and others outside of the project site the project activities and the benefits they can derived from the project. Currently, 5 reforestation project participants and agro-forestry participants were identified based on the progress of their plantation areas and agro-forestry farms. Each participant will be provided additional assistance and trainings to further improve their skills and fully develop their model farms so they can become effective trainers themselves and promote farmer to farmer training which is more effective than the classroom type training.

Strengthening of cooperative members is also one focus of the project. This is the most crucial part of the project implementation because of the establishment of the Reforestation Fund [as mentioned in G1.6] and to sustain the project beyond the project's lifetime. A series of trainings that focus on building their skills and capacitate the members have been identified, some of which have been conducted such as Cooperative Financial and Management trainings, orientation on the basic requirements by the Cooperative Development Authority for them to comply with the needed requirements to operate a cooperative, leadership training, trust building, marketing and other relevant trainings on cooperative development (see Table 12). These trainings will prepare them to manage their cooperatives and implement their business enterprises that include microfinancing for members, mango and other fruit trees in their respective agroforestry farms. This plan will be discussed to them during trainings as examples and also to show them what potential activities the cooperative will handle and manage in the future.

Table 12. List of relevant trainings conducted to project participants

List of Trainings Conducted	Training Manual Distributed
Cooperative Ownership Seminar	<ul style="list-style-type: none"> • Manual on Revisiting of cooperative concepts, principles, practices, objectives, purposes and privileges • Guide on Nature and Characteristics of a Cooperatives • Guide on the Types and Categories of Cooperatives • The Cooperative and the Community
Bookeeping Seminar	<ul style="list-style-type: none"> • Standard Chart of Accounts
Credit Management Seminar	<ul style="list-style-type: none"> • Notes in Credit Management and Delinquency Control
Savings Mobilization Seminar	<ul style="list-style-type: none"> • Guidebook on Savings-Based Microfinance
Training on Agroforestry Techniques/Sloping Agricultural Land Technology (SALT) I to IV	<ul style="list-style-type: none"> • Presentation Paper on Agroforestry Orientation. • Training Manual on SALT 1 to IV • Presentation on Sustainable Agriculture
Vegetable Production Seminar	<ul style="list-style-type: none"> • Guide to Vegetable Production
Training on Basic Composting/Organic Fertilizer	<ul style="list-style-type: none"> • Handling and use of organic fertilizers and composting
Seminar on Mango Care and Maintenance	<ul style="list-style-type: none"> • Guide on Basic Handling of Mango • Guide on Cultural Practices and Integrated Pest Management • Guide on Pesticide Residue Analysis • Presentation on Water Management of Mango • Presentation on Mango Strategic Plan (2006) by Department of Agriculture Region 02
Biodiversity Monitoring System	<ul style="list-style-type: none"> • Presentation on Different types of Birds and bats • Presentation on Biodiversity Monitoring Overview
Orientation Workshop on SAPA and PACBRMA	<ul style="list-style-type: none"> • Presentation paper on PACBRMA and SAPA • Process Flow Chart on PACBRMA & SAPA Application

G4.4 Show that people from the communities will be given an equal opportunity to fill all employment positions (including management) if the job requirements are met. Project proponents must explain how employees will be selected for positions and where relevant, must indicate how local community members, including women and other potentially underrepresented groups, will be given a fair chance to fill positions for which they can be trained.

Since CI is the project lead implementer, the system of hiring is thus based on CI hiring policy. As an institution, CI has an established policy on hiring that subscribes to the universally accepted norms for human resources development. Worthy to emphasize is its adherence to providing equal opportunity for everyone who is qualified irrespective of gender, religion or nationality. This is also being maintained as the hiring policy in the project.

In general, residents within the covered barangays of the project are the target beneficiaries except for other highly technical positions that can't be provided from the covered barangays. Indigent and forest resources dependent families are the target priority beneficiaries of the

project. Involvement of men and women is highly dependent on the kind of task and capacity of individual.

Available job/task will be equally open to the potential beneficiaries but selection varies depending on the willingness, capacity and interest of the individuals.

But all things being equal for applicants for a given position, the project gives preference to those who are from communities in the project site or from adjacent communities. Hence, the project now hires three technical field staff locally and two from nearby Tuguegarao City.

Working as nursery aides or other tasks requiring some minimum qualifications like being able to read and write, the project hires locals with the assistance of barangay officials who confirm and endorse that such applicants meet the minimum qualifications. Under this category of positions, all of those hired come from the local communities in the project site and are provided necessary training they need.

All wage-earning hirings for all field implementation activities come from the project site. In the desire of the project to give employment opportunity to everyone who is interested to work, job rotation is adopted.

G4.5 Submit a list of all relevant laws and regulations covering worker's rights in the host country.

Describe how the project will inform workers about their rights. Provide assurance that the project meets or exceeds all applicable laws and/or regulations covering worker rights and, where relevant, demonstrate how compliance is achieved.

- Labor Code of the Philippines, more precisely Book I-VII governing employees. [This Code is the Presidential Decree No. 442 – as amended. A Decree Instituting A Labor Code, Thereby Revising And Consolidating Labor And Social Laws To Afford Protection To Labor, Promote Employment And Human Resources Development And Ensure Industrial Peace Based On Social Justice.]
- Omnibus Rules Implementing The Labor Code [or Rules To Implement The Labor Code.]
- Local Minimum Wage Law set by Regional Tripartite Wages and Productivity Board, DOLE Region 02

The project communicates to the workers their rights in several occasions, first during the application and interview as part of the recruitment process, and periodically during the engagement period. As lead implementer, CI applies uniformly its policies on human resources development [HRD] which complies with the Philippines' labor law and its implementing rules. For instance, the project will only enter into labor contracts that comply with existing national laws or even international rules that clarify the rights and obligations of both contracting parties. CI is all the more obliged to comply with existing laws to protect and keep its legal status as a recognized global organization. This is checked and verified through external auditing that CI submits itself to annually.

Through community consultations prior to the project implementation, the project adopted a standard community-wide wage rate of PhP150/day for hired daily laborers. Although the intention was not to disturb the local labor balance, this wage rate has been below the government-set local minimum wage. To rectify the situation, the project has come to agreement with the communities to implement the legal minimum wage rate of PhP220 for all its daily hired laborers (proof on record).

G4.6 Comprehensively assess situations and occupations that pose a substantial risk to worker safety. A plan must be in place to inform workers of risks and to explain how to minimize such risks. Where worker safety cannot be guaranteed, project proponents must show how the risks will be minimized using best work practices.

Some field activities may pose potential risks for project staff and project partners as well as daily hired laborers who are directly involved as field workers. These activities include:

- Forest fires suppression—forest fire threatens fire suppression team with combination of smoke and heat
- Patrolling operations—patrolling members may encounter hot-headed offenders who may cause physical harm to them
- Use and handling of agricultural chemicals—pesticide/fungicide that may be resorted to in agroforestry by the participating upland farmers, and in the nursery by the nursery caretakers, may cause harm to themselves during use and handling (even harm the natural environment, by polluting the soil, water and air, and to the local wildlife and local communities).
- Brushing, fireline construction, hole digging and other activities involving the use of cutting/pointed tools—bolo for cutting and pointed bar for hole digging are the typical tools which may cause physical injury to the user.
- Evaluation of reforestation plantations—daily hired laborers tasked to conduct the evaluation of planted reforestation areas pose potential risks as well such as being threat of wild animal bites and danger from the natural working environment as well.

All project staff and project partners and hired laborers who perform field activities will be oriented and trained to follow safe operation guidelines attendant to the nature of the work they will perform to avoid, or if needed, cope with possible risks that may endanger their health and safety while at work. These safety guidelines will emphasize the proper way of doing their work, care and maintenance of tools, attendant risks and precautions, and first-aiding. During activity implementation, supervision will include detection of the potential risks and identification and set-up of necessary safety measures to avoid or minimize the risks. Likewise, the supervisor has to constantly remind field implementers about personal safety as part of his regular daily tasks. (See Appendix 7 for safety guidelines)

G4.7 Document the financial health of the implementing organization(s) to demonstrate that financial resources budgeted will be adequate to implement the project.
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CI's financial statements are audited and certified annually by a respected firm in the auditing industry. Conservation International (CI) strives to exercise the highest level of stewardship over donor contributions and we are proud to earn accolades for our financial management. CI was listed in Charity Navigator's list, "10 of the Best Charities Everyone's Heard Of." CI also earned an "A" efficiency rating from the American Institute of Philanthropy for the 11th year in a row, with 84 percent of expenses directly supporting conservation programs and just 5 percent supporting fundraising efforts. Conservation International reached 84% of its goal at the end of Fiscal year 2008.

Conservation International has offices in 26 countries, and Conservation International-Philippines (CIP) is one of them. CIP has had an annual budget of over a million dollar over 10 years. CIP funds are from grant-funding private foundations, corporate agencies, US government, non-US government and multilaterals.

Currently, CIP has 23 projects in different geographic areas in Sulu-Sulawesi Seascapes, Cagayan, Isabela, Palawan, Batangas and Mindoro provinces. Activities cover marine works, Coral Triangle Initiative, reforestation, agroforestry, biodiversity research, population/health & environment, human wellbeing, climate change mitigation and adaptation, forest carbon, and partnership. Walton Family Foundation and Toyota Motor Corporation are the major donors of CIP for the marine and terrestrial projects, respectively. In 2008 fiscal year (July 1st - June 30th), grants to external partners occupied 11% of CIP's total expenses.

Funding support for this Philippine Peñablanca Sustainable Reforestation Project comes primarily as grant from Toyota Motor Corporation. Grant fund allocation is sufficient to ensure that project activities are carried out over the intended project period. The financial monitoring and reporting system agreed between Toyota and CI allows some flexibility for adapted financial management.

Gen	Clim	Comm	Bio
G5.		Required	

G5. Legal Status and Property Rights

G5.1 Submit a list of all relevant national and local laws and regulations in the host country and all applicable international treaties and agreements. Provide assurance that the project will comply with these and, where relevant, demonstrate how compliance is achieved.

In the context that this project is located inside a proclaimed protected area, undertakes reforestation, enhancement planting and agroforestry in classified forestland of the public domain, involves communities who are considered indigenous peoples, and within the administrative jurisdiction of local government units, the following are the relevant laws and regulations:

- Republic Act No. 7586 – National Integrated Protected Areas System Act of 1992
- DENR Administrative Order No. 2008-26- Revised Implementing Rules and Regulations of Republic Act No. 7586
- DENR Administrative Order No. 2004-32- Revised Guidelines on the Establishment and Management of Community-Based Program in Protected Areas
- Presidential Proclamation No. 484- Proclaiming Peñablanca Protected Landscape and Seascape as a Protected Area
- DENR Administrative Order No. 96-20- Implementing Rules and Regulations on Prospecting of Biological and Genetic Resources
- Republic Act No. 9147- Wildlife Resources Conservation and Protection Act
- Joint DENR-DA-PCSD Administrative Order No. 01, Series of 2004- Implementing Rules and Regulations of Republic Act No. 9147
- DENR Administrative Order No. 2005-01- Establishing the National List of Threatened Philippine Plants and their Categories
- Presidential Decree No. 705 as amended-Revising PD No. 389, Otherwise Known as the Forestry Reform Code of the Philippines
- Republic Act No. 8371- The Indigenous Peoples Rights Act of 1997
- Executive Order No. 318- Promoting Sustainable Forest Management in the Philippines
- DENR Administrative Order No. 2005-25- Guidelines in the Implementation of Upland Agroforestry Program.
- Republic Act 9520- Philippine Cooperative Code of 2008
- Labor Code of the Philippines, more precisely Book I-VII governing employees. [This Code is the Presidential Decree No. 442 – as amended. A Decree Instituting A Labor Code, Thereby Revising And Consolidating Labor And Social Laws To Afford Protection To Labor, Promote Employment And Human Resources Development And Ensure Industrial Peace Based On Social Justice.]
- Omnibus Rules Implementing the Labor Code [or Rules to Implement the Labor Code.]
- Wage Order No. RTWPB-II-13- Increasing the Minimum Wage Rates of Workers in the Private Sector in Region 2
- PPLS-PAMB Resolution No. 07-2007- Resolution Approving the Implementation of Toyota Motors Corporation and Conservation International-Philippines-Supported Project Entitled: Restoring the Forests of the Peñablanca Protected Landscape And Seascape For Watershed and Biodiversity Conservation and as Catalyst for Socioeconomic Development

- Memorandum of Understanding (MOU) Among DENR, LGU Peñablanca, CI and Toyota Motors Corporation, to collaborate and cooperate to implement the project entitled Restoring the Forests of the Peñablanca Protected Landscape And Seascape For Watershed and Biodiversity Conservation and as Catalyst for Socioeconomic Development
- DENR Administrative Order No. 2000- 13- Guidelines on the Implementation of the Biodiversity Monitoring System (BMS) in Protected Areas
- DENR Administrative Order No. 1988-97-Revised Regulations Implementing the Integrated Social Forestry Program under LOI 1260
- Peñablanca Municipal Resolution No 120-S 2007- Resolution on Astray Animals
- Cabasan Barangay Ordinance No. 01-s 2008- Ordinance on Astray Animals
- Bugatay Barangay Ordinance No. 01-S-2008- Ordinance on Astray Animals
- Sisim Barangay Ordinance No. 12-S-2008- Ordinance on Astray Animals
- San Roque Barangay Ordinance No. 05-S-2008- Ordinance on Astray Animals
- Mangga Barangay Ordinance No 04-S-2008- Ordinance on Astray Animals

The project will comply with all of these laws and regulations. The project is implemented in close coordination and communication with a national government agency (the DENR) and local government (LGU of Peñablanca). The compliance is assured by this project arrangement.

G5.2 Document that the project has approval from the appropriate authorities, including the established formal and/or traditional authorities customarily required by the communities.

The project has a Memorandum of Understanding between the Department of Environment and Natural Resources and the Local Government Unit of Peñablanca, Cagayan province—entities who have mandates over the project area . As required by Philippines’ protected area law (Republic Act 7586- National Integrated Protected Areas System Act of 1992), it has also secured permission from the Protected Area Management Board (PAMB), a multi stakeholder group composed of LGUs, Local NGOs, private sector, government agencies that serves as the policy making body within the protected area, to implement the project through PAMB Resolution No 7-2007.

G5.3 Demonstrate with documented consultations and agreements that the project will not encroach uninvited on private property, community property, or government property and has obtained the free, prior, and informed consent of those whose rights will be affected by the project.

The project is supporting the activities of the government, based on the PPLS Management Plan. The project site is a government property in the multiple use zone and its selection is cleared first with the government through the DENR/PPLS Protected Area Management Board-Protected Area Superintendent Office who ensures that the project site is free from any legal encumbrances and consistent with management zoning.

All current occupants or communities with farm lots within the project site are confirmed as residents of the five barangays covered by the project area, and will potentially be involved as project beneficiaries. As discussed in section G.1.6, tenurial instruments on some areas have

already been awarded to individual families by the government thru the DENR. Their identities and willingness to participate in the project are determined through meetings and consultations with barangay council and community members. Actual ground validation are also conducted with the lot owners, in the presence of barangay council and DENR staff to map out the boundaries and confirm claims of the farm lots within the project area.

Cultivated farmlots that do not have any tenurial instrument are also being mapped, and the occupants are being identified through consultations. Appropriate lot tenure will be secured for the tenured migrants through the DENR for their participation in the project. This is to ensure that no further expansion of farm will occur. The project will not allow any additional in-migration and occupation or expansion of farm lots to public land and community property.

The participation and cooperation of local communities and farmlot occupants will be legitimized and formalized through a Memorandum of Agreement. Signing the MOA is based on their free, prior and informed consent after sufficient consultation and discussion have been performed.

G5.4 Demonstrate that the project does not require the involuntary relocation of people or of the activities important for the livelihoods and culture of the communities. If any relocation of habitation or activities is undertaken within the terms of an agreement, the project proponents must demonstrate that the agreement was made with the free, prior, and informed consent of those concerned and includes provisions for just and fair compensation.

No relocation of current occupants of the land will be done. On the contrary, they will be invited to participate in the project as noted in G5.3.

Relocation of cattles, water buffalos and other animals from the project site to other grazing areas

The whole area covered by the project is within the Peñablanca Protected Landscape and Seascape which was proclaimed under Proclamation 484 signed by the President of the Philippines in October 6, 2003. Before the approval of the project, very limited environmental initiatives were being conducted in the area. Because of this, some residents took the opportunity to temporarily use the area for grazing cattles, water buffalos (carabaos), horses and goats. There are about 332 recorded heads of cattles and carabaos (owned by 20 different individuals) in the area and limited numbers of horses and goats. Due to the presence of grazing animals, the area is intentionally burned regularly during summer by the animal owners to produce new grasses for their animals.

Astray animals caused conflicts with participants of reforestation and agroforestry activities of the project after the project was approved in 2007. In December 14, 2007, with the help of Barangay officials of the covered Barangays, this problem was brought to the Sangguniang Bayan Council of LGU Peñablanca for assistance in solving the issue. Immediately, the Sangguniang Bayan Council released a resolution addressed to the five covered Barangays requesting all the Barangay Captains of the project-covered Barangays to prohibit all grazing animals within the project site. The Resolution No 120-S 2007 was signed by the Municipal Mayor of Peñablanca in January 2, 2008. This Municipal Resolution was enacted by the Barangay officials immediately through Barangay Ordinances which passed through a series of Barangay consultations and public hearings made in each of the 5 Barangays for all residents to be aware of the LGU Resolution and Barangay Ordinance on astray animals. Each of the covered Barangays implements their ordinance. One of the functions of the protected area has been operationalized with the input of the project.

Following the law/ordinance, cattle owners agreed to move their animals outside the area to the communal pasture area in Cabasan and to other neighboring legitimate pasture areas (Figure 13). These pasture areas collectively has capacity to hold over 1,400 heads of cattle (Table 13), which can easily accommodate the less than 400 heads of cattle currently grazing inside the project. A more detailed account of pasture areas is provided in CM2.3.

Table 13. Possible pasture areas to accommodate grazing animals from the project

PLA Owner	Area (ha)	Capacity (heads)	Existing cattle (heads)
Juana Lavadia	500	500	180
Warmesley	380	380	20
Silverio Camarao (under renewal/transfer from Anecito Torres)	149	149	40
Oliva (new application/transfer from Domingo Lavadia, Jr.)	450	450	0
Total for PLAs	1,479	1479	240
Communal Pasture in Cabasan	300	300	220
Grand Total	1,779	1,779	460

Relocation of firewood collection areas

Relocation of activities also occurs from the introduction of two strategies to divert the local communities from gathering firewood from natural forest to their own plantation or in the communal plantation. These strategies are:

First is planting of firewood within the agroforestry farm lots and communal plantations. Second is the introduction of rice-hull stove and efficient fuel wood stove.

These strategies passed through series of consultation and discussion with the DENR, LGU (barangay level) and project participants within the communities. The communities positively accepted the idea and are willing to participate. Participants under agroforestry component already started planting firewood species in their farms (on the peripheries of lots). Identification of communal fuelwood plantation areas was also done in partnership with partner DENR, community leaders and project staff (Figure 14).

In the project, from 1000 potential target family participants for agroforestry and reforestation, up to 628 families are targeted to establish fuelwood plantation in their farm lots. Up to 372 families who do not have farms are encouraged to participate in communal fuelwood plantation.

The western side of the project, namely Barangays Cabasan, Bugatay, Sisim and San Roque, is close to rice producing area. Abundant rice hull, which rice millers dispose of as waste with fee, can be used as an alternative fuel. Several models of rice-hull stoves have been distributed to households for testing (Figure 15). Models for high-efficiency fuelwood stove is also under testing. Of the potential 1000 families, the project plans to provide the rice-hull stoves to up to 822 families and the efficient fuelwood stoves to 178 families to complement the participants reducing pressure from fuelwood harvesting in natural forests.

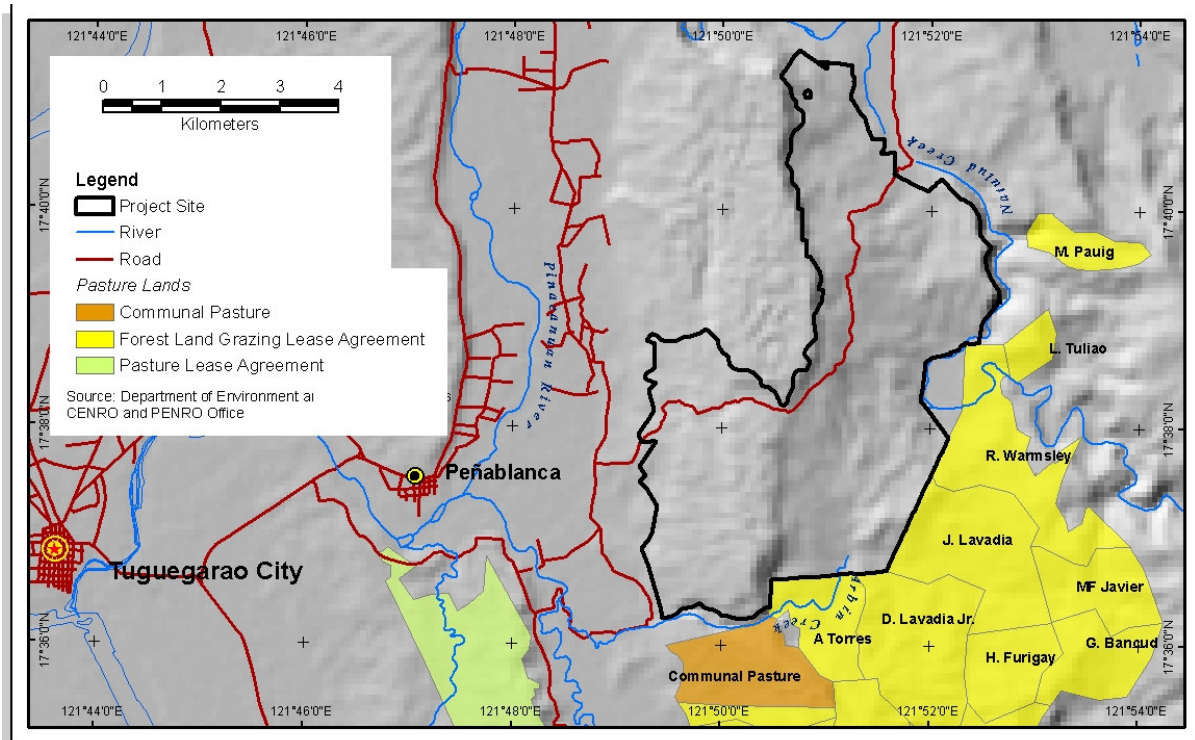


Figure 13. Locations of pasture areas.

Pasture Lease Agreement of A. Torres is under process of transfer to Silverio Camarao, and that of D. Lavadia Jr. to Oliva.

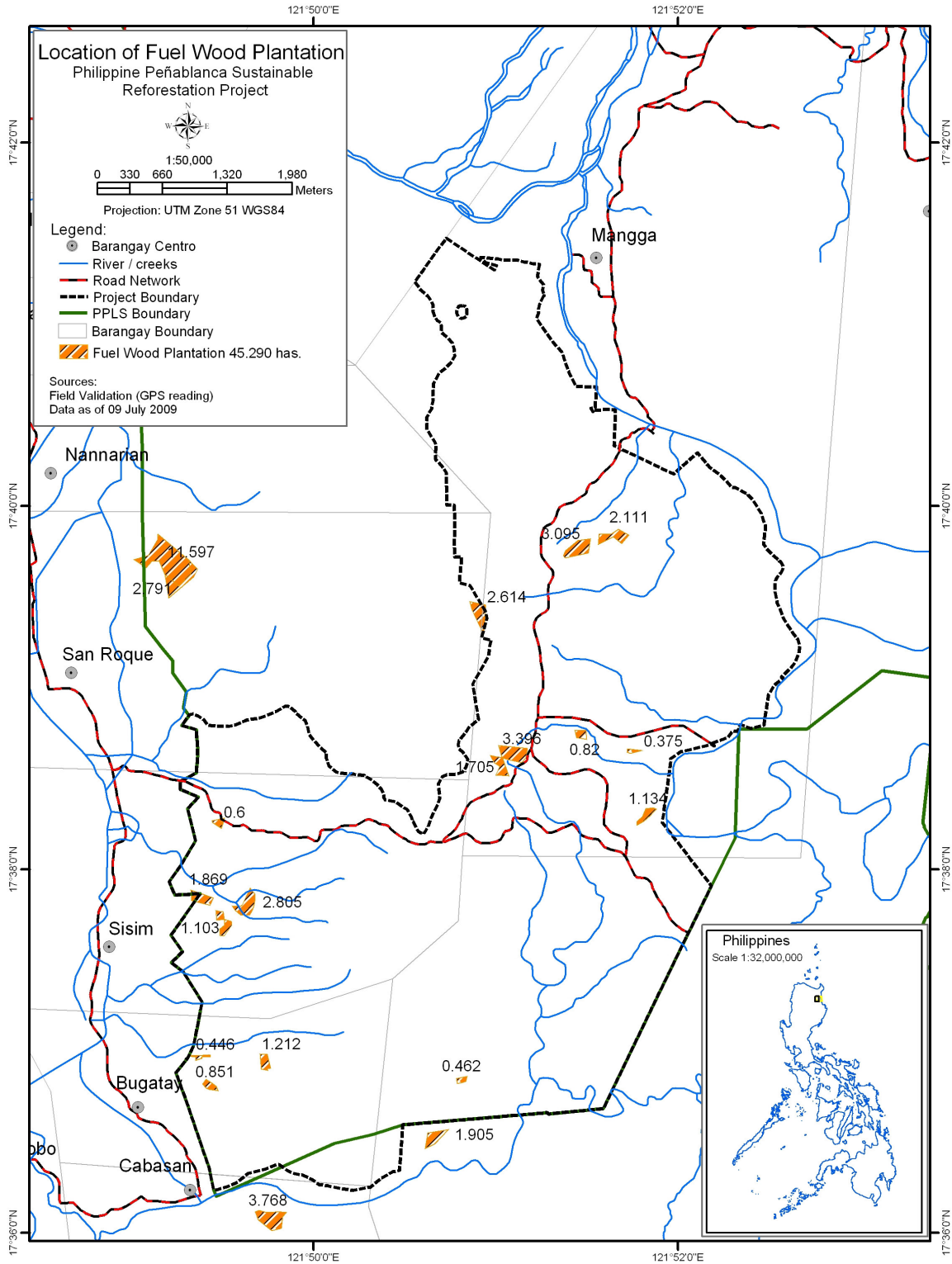


Figure 14. Locations of fuelwood plantations

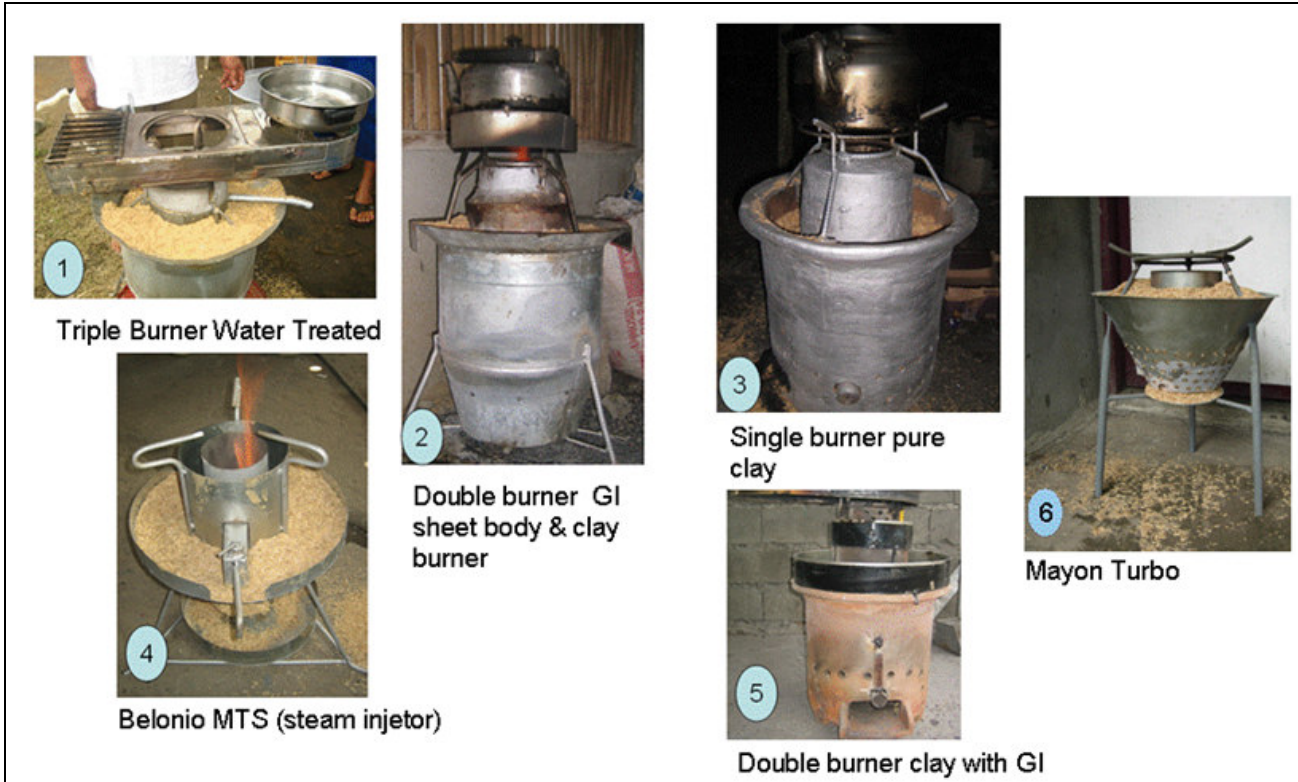


Figure 15. Models of rice-hull stoves under testing for efficiency and durability

G5.5 Identify any illegal activities that could affect the project’s climate, community or biodiversity impacts (e.g., logging) taking place in the project zone and describe how the project will help to reduce these activities so that project benefits are not derived from illegal activities.

Illegal activities being done by local communities within the project zone include wood extraction for firewood and charcoal, and grazing astray animals. Associated to these activities is the occurrence of uncontrolled grassfires. See section G3.5 for the project mitigating measures which provide intervention support to address the underlying causes: lack of access to legal source of wood, inadequate sources to increase family income and low level of awareness about conservation.

G5.6 Demonstrate that the project proponents have clear, uncontested title to the carbon rights, or provide legal documentation demonstrating that the project is undertaken on behalf of the carbon owners with their full consent. Where local or national conditions preclude clear title to the carbon rights at the time of validation against the Standards, the project proponents must provide evidence that their ownership of carbon rights is likely to be established before they enter into any transactions concerning the project's carbon assets.

This project is concerned about helping to reduce carbon emissions through carbon sequestration (A/R) and emission avoidance (REDD). Toyota Motor Corporation, as the donor and a project partner, maintains a clear position that it does not claim carbon rights generated from the project activities, and that such rights should belong to local entity or entities.

As to carbon rights ownership, the Philippine government has no specific policy yet in existence. However, to anticipate conflicts that may arise as to who owns the carbon, the DENR agreed, in consensus with other stakeholders, that the Certificate of Stewardship Contract (CSC)⁷ holders shall own the carbon. This arrangement covers most of the agroforestry areas. The DENR, the land owner of untenured part of the project area, further specified that the holder of the Protected Area Community-Based Resource Management Agreement (or PACBRMA)⁸ shall also own the carbon. This was agreed upon by the participants during the workshop conducted on November 19, 2009. DAO 2004-32 discusses the implementing rules on Protected Areas Community-Based Resource Management Agreement (PACBRMA) (See Appendix 8). In addition, the cooperatives will represent the CSC holders within the project area in matters related to transaction of such rights.

With the project's facilitation, the cooperatives are in the process of obtaining PACBRMA, which will cover the entire project area. The carbon owner for the PACBRMA area will be the cooperatives. All the reforestation participants are encouraged to join the cooperatives in their respective barangays.

Between CSC and PACBRMA, the ownership of all the carbon rights will be specified. The letter from Regional Executive Director of DENR Region 02 attests to this arrangement (Appendix 2).

⁷ A CSC is a land tenure instrument awarded to individual participants under the DENR's Integrated Social Forestry program.

⁸ PACBRMA is awarded to communities that devise and implement resource management plan over the public land within the specified boundaries inside a protected area.. Land tenure instrument under PACBRMA is awarded to the communities or the groups of people who are responsible for the management plan.

Gen	Clim	Comm	Bio
CL1.	Required		

CLIMATE SECTION

CL1. Net Positive Climate Impacts

CL1.1 Estimate the net change in carbon stocks due to the project activities using the methods of calculation, formulae and default values of the IPCC 2006 GL for AFOLU or using a more robust and detailed methodology. The net change is equal to carbon stock changes *with* the project minus carbon stock changes *without* the project (the latter having been estimated in **G2**). This estimate must be based on clearly defined and defensible assumptions about how project activities will alter GHG emissions or carbon stocks over the duration of the project or the project GHG accounting period.

Total of 2,340 ha is included in consideration for carbon accounting. The net change in carbon stocks due to the project activities are estimated over the 30 year period (Table 14). Without the project, the areas intended for reforestation, agroforestry and enhancement planting will continue to be covered by grassland, bare/burnt, shrubland or cornfield, while forests will continue to decline. Since carbon densities of grassland, shrubland and corn are small, it is expected that the amount of carbon that will be stored in those areas will be very low. Based on the results obtained from the carbon stocks assessment study by Lasco and Pulhin (2008) in this project area, grassland and cornfield have carbon densities of 1.81 tC/ha and 1.87 tC/ha, respectively. Carbon density for bare/burnt is assumed to be zero, while shrubland and forests have carbon densities of 13.72 tC/ha (Eusebio, 1988) and 94.05 tC/ha (Lasco et al., 2004), respectively. Using these carbon density values, it is projected that without the project, the carbon stocks in the proposed project area will decline to 91,526 tC in Year 30.

With the project however, grassland, bare/burnt, shrubland and cornfield will be planted with indigenous trees under the reforestation and enhancement planting components and fruit trees under the agroforestry component. Considering that reforestation and agroforestry areas have larger biomass densities compared with the current land uses in the project area, it is certain that the proposed project site will store huge amount of carbon. Using the annual biomass accumulation rates for native species (5.7t/ha; Alipon et al., 2005) and agroforestry (4t/ha; CI, 2007), total carbon stored in the project will increase through time.

Moreover, additional carbon can be gained from reduced carbon emissions as a result of the protection activities in the natural forest within the 2,943-ha project area against further deforestation and forest degradation. Thus, at Year 30, expected carbon stocks with the project (including forest conservation component) will be 191,157 tC. Taking the difference between the total carbon stocks with and without the project, the total net carbon benefits due to project activities at Year 30 will be 99,961 tC (or 366,524 tCO₂e).

Table 14. Estimate of net change in carbon stocks (in tC) by project component.

Year	Reforestation		Agroforestry		Forest Conservation		Total		Net changes due to project activities
	Without project	With project	Without project	With project	Without project	With project	Without project	With project	
1	422	456	179	150	95,054	95,054	95,655	95,659	5
2	770	1,336	594	523	94,768	95,054	96,145	96,913	781
3	1,580	3,178	1,064	1,134	94,484	95,054	97,152	99,365	2,238
4	2,646	5,874	1,428	1,909	94,201	95,054	98,312	102,836	4,562
5	2,646	8,555	1,428	2,680	93,918	95,054	98,041	106,289	8,297
6	2,646	11,226	1,428	3,449	93,636	95,054	97,771	109,729	12,018
7	2,646	13,891	1,428	4,215	93,355	95,054	97,503	113,160	15,730
8	2,646	16,550	1,428	4,980	93,075	95,054	97,234	116,584	19,434
9	2,646	19,205	1,428	5,744	92,796	95,054	96,967	120,002	23,132
10	2,646	21,856	1,428	6,506	92,518	95,054	96,700	123,416	26,824
11	2,646	24,504	1,428	7,268	92,240	95,054	96,435	126,825	30,511
12	2,646	27,149	1,428	8,028	91,963	95,054	96,170	130,230	34,193
13	2,646	29,791	1,428	8,788	91,687	95,054	95,905	133,633	37,871
14	2,646	32,431	1,428	9,547	91,412	95,054	95,642	137,032	41,545
15	2,646	35,069	1,428	10,306	91,138	95,054	95,379	140,429	45,216
16	2,646	37,705	1,428	11,064	90,865	95,054	95,117	143,823	48,884
17	2,646	40,340	1,428	11,821	90,592	95,054	94,856	147,215	52,548
18	2,646	42,973	1,428	12,578	90,320	95,054	94,595	150,604	56,210
19	2,646	45,604	1,428	13,335	90,049	95,054	94,335	153,992	59,869
20	2,646	48,234	1,428	14,091	89,779	95,054	94,076	157,378	63,525
21	2,646	50,863	1,428	14,846	89,510	95,054	93,818	160,763	67,178
22	2,646	53,490	1,428	15,601	89,241	95,054	93,560	164,145	70,830
23	2,646	56,116	1,428	16,356	88,974	95,054	93,303	167,526	74,478
24	2,646	58,742	1,428	17,111	88,707	95,054	93,047	170,906	78,125
25	2,646	61,366	1,428	17,865	88,441	95,054	92,792	174,284	81,769
26	2,646	63,989	1,428	18,619	88,175	95,054	92,537	177,661	85,412
27	2,646	66,611	1,428	19,372	87,911	95,054	92,283	181,037	89,052
28	2,646	69,232	1,428	20,126	87,647	95,054	92,030	184,411	92,690
29	2,646	71,852	1,428	20,879	87,384	95,054	91,778	187,785	96,326
30	2,646	74,472	1,428	21,632	87,122	95,054	91,526	191,157	99,961

Note: From Year 1 to Year 4, only the part of project area that has received active intervention has been considered for calculation.

CL1.2 Estimate the net change in the emissions of non-CO₂ GHG emissions such as CH₄ and N₂O in the *with* and *without* project scenarios if those gases are likely to account for more than a 5% increase or decrease (in terms of CO₂-equivalent) of the project's overall GHG emissions reductions or removals over each monitoring period.

The CDM Executive Board agreed at its 42nd meeting held during 24-26 September in Bonn, Germany that GHG emissions in A/R CDM project activities from (i) fertilizer application, (ii) removal of herbaceous vegetation, and (iii) transportation may be considered as insignificant and hence can be neglected in A/R baseline and monitoring methodologies (<http://cdm.unfccc.int/EB/042/eb42rep.pdf>; p.6).

Nonetheless, CO₂ emission from fertilization was estimated following the prescribed methodology by the CDM Executive Board: "Estimation of direct nitrous oxide emission from nitrogen fertilization" (Version 01; http://cdm.unfccc.int/EB/033/eb33_repan16.pdf). GHG emission by component by year is shown in Table 15. The total emission due to fertilization amounts to 3,130.61 tCO₂e. This demonstrates that fertilization indeed accounts for less than 5% (0.9%) of the GHG removals of the project.

Livestock is a source of methane. A stray animals will be removed from the project area. This will increase project's climate benefit, but it is likely offset in the equal amount, by leakage as the animal may simply be transferred outside the project area. The net impact from methane is expected to be zero.

Table 15. CHG emission from fertilization (in CO₂e).

Year	Component				Total
	Reforestation	Agroforestry	Enhancement Planting	Nursery	
0	0.00	0.00	0.00	13.07	13.07
1	118.73	137.66	2.16	15.16	273.71
2	103.64	366.25	6.90	26.72	503.51
3	235.04	620.64	15.44	22.73	893.85
4	156.99	655.79	18.24	0.00	831.02
5	0.00	435.82	0.00	0.00	435.82
6	0.00	179.63	0.00	0.00	179.63
7	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00
Total	614.4	2395.79	42.74	77.68	3130.61

CL1.3 Estimate any other GHG emissions resulting from project activities. Emissions sources include, but are not limited to, emissions from biomass burning during site preparation, emissions from fossil fuel combustion, direct emissions from the use of synthetic fertilizers, and emissions from the decomposition of N-fixing species.

Emission from vehicle transport was estimated following the methodology: “Estimation of GHG emissions related to fossil fuel combustion in A/R CDM project activities” (Version 01; http://cdm.unfccc.int/EB/033/eb33_repan14.pdf). CO₂ emission from transportation is estimated at 27.73 tCO₂e/year (from Year 1 to 4). This is estimated from total annual diesel fuel and oil used by CI for activities related to implementing the project activities during the first two years of the project. The project activities that use vehicles will be reduced from the fifth year through Year 30, which was estimated at a half of the first four years (i.e., 13.89 tCO₂e/year). The total estimated GHG emission from transportation for the entire project period is 472 tCO₂e, and clearly shows that vehicle use is an insignificant source of GHG.

The site preparation method adopted for the project does not involve biomass burning. Herbaceous vegetation will be partially mowed before planting seedlings and during periodic maintenance. The mowed plants are left on site. The emission from this activity is not considered as in the conclusion by the CDM Executive Board cited in CL1.2.

All labor for the project activity are from local villages, hence the transportation need is minimal. All seedlings will be grown on site and transported to the planting sites by man-power/animal-power. The conclusion by the CDM Executive Board cited in CL1.2 further supports that this is negligible.

CL1.4 Demonstrate that the net climate impact of the project is positive. The net climate impact of the project is the net change in carbon stocks plus net change in non-CO₂ GHGs where appropriate minus any other GHG emissions resulting from project activities minus any likely project-related unmitigated negative offsite climate impacts (see CL2.3).

The net change presented in Table 16 represents the project’s net total climate impact of the project, and it is positive. The total amount of the project’s net carbon benefit (CO₂ sequestered and CO₂ emission avoided, minus GHG emitted from project activities) over 30 years is 362,920 tCO₂e (Table 16). Thus, the net climate impact is projected to be positive.

Table 16. Net carbon benefit by the project (tCO2e).

Year	Reforestation	Agroforestry	Forest Conservation (or REDD)	Total
	tCO2e			
1	124	-107	0	17
2	2,078	-262	1,046	2,862
3	5,858	259	2,088	8,205
4	11,836	1,763	3,127	16,726
5	21,666	4,591	4,164	30,421
6	31,462	7,409	5,197	44,067
7	41,232	10,219	6,227	57,678
8	50,983	13,023	7,254	71,260
9	60,717	15,823	8,277	84,817
10	70,437	18,619	9,298	98,354
11	80,146	21,411	10,316	111,872
12	89,844	24,200	11,330	125,374
13	99,533	26,986	12,342	138,861
14	109,213	29,769	13,351	152,333
15	118,886	32,551	14,356	165,793
16	128,553	35,330	15,359	179,241
17	138,212	38,107	16,358	192,677
18	147,866	40,882	17,355	206,103
19	157,515	43,656	18,348	219,519
20	167,158	46,428	19,339	232,924
21	176,796	49,198	20,326	246,321
22	186,430	51,968	21,311	259,708
23	196,060	54,735	22,293	273,088
24	205,685	57,502	23,271	286,458
25	215,307	60,267	24,247	299,821
26	224,925	63,032	25,220	313,176
27	234,539	65,795	26,190	326,524
28	244,150	68,557	27,157	339,864
29	253,758	71,318	28,121	353,197
30	263,363	74,078	29,082	366,523
Project emissions (Fertilization: 3,131; Transportation: 472):				-3,603
Total net carbon benefit:				362,920

CL1.5 Specify how double counting of GHG emissions reductions or removals will be avoided, particularly for offsets sold on the voluntary market and generated in a country with an emissions cap.

Currently, carbon credit is not traded in regulated or voluntary markets. The carbon benefit is quantified for the purpose of measuring the project's positive climate impact only.

The project has established a clear carbon right ownership with the national authority and among the project partners. If and when the carbon credits are traded, the clear carbon right ownership

will be the best safeguard against GHG double counting. Under the arrangement developed for the project, the cooperatives will be the check point for all carbon transactions. Single ownership can be complemented by having the carbon registered with a single, established carbon accounting registry, such as the VCS registry.

The Philippines is not under emission cap (at least for now).

Gen	Clim	Comm	Bio
CL2.	Required		

CL2. Offsite Climate Impacts ('Leakage')

CL2.1 Determine the types of leakage that are expected and estimate potential offsite increases in GHGs (increases in emissions or decreases in sequestration) due to project activities. Where relevant, define and justify where leakage is most likely to take place.

The project expects the leakage to be zero for the following reasons.

Only possible source of leakage is deforestation due to displacement of grazing animal and wood-gathering for fuelwood and charcoal that existed within the project area to outside of the project area. The nature and extent of wood gathering and animal grazing are described in CM2.1. The limitation on wood-gathering within the project area is properly addressed by the project to prevent leakage (see CL2.2).

The local municipality passed an ordinance to ban animal grazing as part of their contribution to the project. The displacement of the animals is attributable to the project, and constitutes a possible source of leakage. However, the grazing animals are transferred to designated, existing pasture permit areas, which are managed at proper grazing level (carrying capacity set by the DENR is 1 head of cattle per hectare). These grazing lands exist under approval by the Department of Environment and Natural Resources through Forest Land Grazing Management Agreement (FLGMA). Part of this activity is to develop and improve grazing area thru planting of high yielding grasses, legumes and reforest at least 10% non grazeable area (DAO36-99). The DENR evaluates compliance with the requirements and management of these areas annually. The animal displacement does not cause new deforestation; hence the leakage from animal displacement is zero.

Other leakage sources that may be common elsewhere, such as farm displacement, are not expected since the project is not going to create conditions for their occurrence. Existing farms are maintained and are the targets of agroforestry development. Reforestation takes place in untenured land; thus no tenured farmers will be displaced. The project acknowledges the presence of "tenured migrants," who are yet to be given tenure to the land, and are facilitating giving them appropriate tenure as part of MOA process for the project participation.

CL2.2 Document how any leakage will be mitigated and estimate the extent to which such impacts will be reduced by these mitigation activities.

A. Alternative fuelwood collection area and alternative stove

The provision of alternatives to fuelwood from natural forest and reducing the demand for fuelwood are the measures adopted by the project to prevent fuel demands from causing leakage.

There are 2 approaches to mitigate the potential leakage:

1. Introduction of alternative fuel source.

In this approach, agroforestry participants will be planting trees as source of fuelwood in their lots to satisfy their fuel demands. An average of 500 fuelwood trees must be planted by each participant of the agroforestry component to meet their fuelwood demand. For those who do not have farm lots within the project area/zone but dependent from fuelwood being collected within the project area, planting of communal fuelwood plantation will be introduced. Each of the barangays will be identifying areas that will possibly supply the needs of any residents who do not have farm or lot. The scheme in the management of the communal plantation shall be developed by the barangay with the technical assistance of the project management team. Support in the establishment of the communal plantation shall also be provided by the project.

2. Introduction of rice hull fueled-stove using waste materials.

Rice hull is being disposed of by farmers without realizing their important use. Rice-hull stove shall be given to those participants who can easily obtain rice hull. On the other hand, participants who do not have access to rice hulls shall be given efficient fuelwood stove to minimize the demand for fuelwood.

B. Transfer of astray animal off-site

By the Municipal Resolution No 120-S 2007 signed by the Mayor of Peñablanca on January 2, 2008, followed by Barangay Ordinances passed through a series of Barangay consultations and public hearings in the five covered barangays, cattle owners have to move their animals outside the project area to the communal pasture area in Cabasan and to other adjacent legitimate pasture area.

In compliance to this ordinance, tenure map as shown in Figure 13 from DENR/PASU indicates two existing Pasture Lease Agreements (PLAs), and two PLAs pending the approval of the DENR with a total aggregate area of 1,479 ha. A total of 240 heads of cattle now exist within these PLAs. At 1:1 ratio, these areas can hold an indicative additional of 1,239 heads of cattle which can easily accommodate about 332 heads of cattle grazing inside the project. Another existing pasture located in Cabasan is a 300-ha Communal Pasture serving 220 heads of cattle from Cabasan and nearby barangays with the condition that cattle owners should help maintain the fence of the pasture area.

Existing practice within the community is only verbal agreement between pasture lease holders and those who wants to combine their animals in the legitimate areas. The first condition is for the interested family who want to combine their animals must pay fifty pesos (P 50.00) per head per year to the PLA holder disregarding the age and size of animals for annual dues to the government for the use of land. Second, each family who combined animals within the legitimate PLA must participate in all the activities inside the pasture area like fencing and maintenance.

Two hundred twelve heads of grazing animals were transferred from the project area to the designated Forest land Grazing Management Agreement (FLGMA) areas wherein owners of displaced animal will participate in all activities inside the pasture area. Part of this activity is to develop and improve grazing area thru planting of high yielding grasses, legumes and reforest at least 10% non grazeable area. In some areas where the owner of the grazing animals has no

access to legitimate pasture land, the project and the project partners like DENR and Barangay LGU provided communal pasture area. DENR evaluates compliance with the requirements and management of these areas annually.

Proper knowledge about the value of protecting and restoring forest, facilitated by the Information, Education and Communication Campaign for wider audience, will also contribute to reduce offsite impacts. These mitigation measures are also described in CM2.2.

CL2.3 Subtract any likely project-related unmitigated negative offsite climate impacts from the climate benefits being claimed by the project and demonstrate that this has been included in the evaluation of net climate impact of the project (as calculated in **CL1.4**).

Since leakage is negligible, the net carbon benefit of 362,920 tCO₂e over 30 years is the same as the total carbon benefits generated by the project.

CL2.4 Non-CO₂ gases must be included if they are likely to account for more than a 5% increase or decrease (in terms of CO₂-equivalent) of the net change calculations (above) of the project's overall off-site GHG emissions reductions or removals over each monitoring period.

As mentioned in CL1.2, displacement of livestock animals will increase offsite methane emission. However, since the reduction of methane emission within the project area is not counted, this increase in offsite emission is completely offset. There is no reason to expect that livestock operation will expand, resulting in increased emission, in the area to which activities are dislocated

Gen	Clim	Comm	Bio
CL3.		Required	

CL3. Climate Impact Monitoring

CL3.1 Develop an initial plan for selecting carbon pools and non-CO₂ GHGs to be monitored, and determine the frequency of monitoring. Potential pools include aboveground biomass, litter, dead wood, belowground biomass, wood products, soil carbon and peat. Pools to monitor must include any pools expected to decrease as a result of project activities, including those in the region outside the project boundaries resulting from all types of leakage identified in CL2. A plan must be in place to continue leakage monitoring for at least five years after all activity displacement or other leakage causing activity has taken place. Individual GHG sources may be considered ‘insignificant’ and do not have to be accounted for if *together* such omitted decreases in carbon pools and increases in GHG emissions amount to less than 5% of the total CO₂-equivalent benefits generated by the project. Non-CO₂ gases must be included if they are likely to account for more than 5% (in terms of CO₂-equivalent) of the project’s overall GHG impact over each monitoring period. Direct field measurements using scientifically robust sampling must be used to measure more significant elements of the project’s carbon stocks. Other data must be suitable to the project site and specific forest type.

In the baseline scenario, carbon stocks in the pools of soil organic matter, litter and deadwood are expected to be constant or decrease due to soil erosion and ongoing human intervention, while the with-project scenario expect these stocks to remain constant. Therefore, these pools are omitted, and only aboveground and belowground biomass will be monitored. The omitted pools will be inspected during the scheduled verification in 2013, in order to reconfirm the baseline assumptions.

The carbon stock changes within the project area will be determined using the methods outlined in the Section 6 of methodology AR-AMS0001. The planting in this project does not involve tilling. Thus, carbon stock changes in pools of soil organic matter, litter and dead wood are assumed to be constant. In reality, as forest develops, soil organic matter, litter and dead wood are expected to increase. Thus, not accounting for the changes in these carbon pools will result in a conservative estimate of carbon benefit from the project. Thus, these carbon pools will be omitted from monitoring, and only carbon stock changes in aboveground biomass and belowground biomass within the project boundary will be monitored.

No non-CO₂ gases will be monitored. Site preparation does not involve burning. Therefore, the emission of nitrous oxide and methane from burning biomass will not occur. Emissions from fertilizer application will not be monitored. As has been discussed earlier, emissions from fertilizer are less than 5% of the GHG removals of the project.

The monitoring plan is described as follows:

Stratification

Parts of the project area that are predicted to have different carbon stocks are divided into different strata.

The project will be pre-stratified. The key stratum will be project activity. Sub-strata may include productivity class and time of planting. Within all project areas, strata boundaries will be delineated in the field using a GPS and recorded within a GIS.

The initial strata will be based on the following factors:

1. Location: Bugatay, Cabasan, Sisim, Mangga, San Roque
2. Baseline condition: Reforestation (grassland, by barangay); Agroforestry (by barangay)
3. Project activity: Forest restoration / Agroforestry

After the first monitoring period (see monitoring frequency below), post stratification may be conducted to address changes in planting design or differences in carbon stocks. The following factors will be considered in post-stratification:

- i. Data from monitoring of forest establishment and project boundary, e.g. project boundary, actual planting year
- ii. Data from monitoring of forest management, e.g. fertilization
- iii. Variation in carbon stock change for each stratum after first monitoring event. Strata will be grouped into one stratum if they have similar carbon stock, carbon stock change and spatial variation.

Sample Size

In AR-AMS0001, there is no method described on how to stratify the area and the number of sample plots to be used. However, Section 38 (iii) states that other stratification approach can be shown in the PDD to estimate the project biomass stocks to targeted precision level of $\pm 10\%$ of the mean at a 95% confidence interval. Thus, the methods described in the methodology AR-AM0004 will be used to determine the number of plots necessary.

Preliminary data for the sample size equation will be collected in areas with land cover similar to the expected land cover under the project. Data will be collected for all stratum types using the same methods as described below. From this field sampled data, estimated mean carbon stocks and variance will be calculated for each stratum.

The below equation, from methodology AR-AM0004, will be used to estimate the number of plots to be established:

$$n = \left(\frac{t}{E} \right)^2 \left[\sum_{h=1}^L W_h \cdot s_h \cdot \sqrt{C_h} \right] \cdot \left[\sum_{h=1}^L W_h \cdot s_h / \sqrt{C_h} \right]$$

$$n_h = n \cdot \frac{W_h \cdot s_h / \sqrt{C_h}}{\sum_{h=1}^L W_h \cdot s_h / \sqrt{C_h}}$$

where:

- L =total number of strata
- t =t value for a confidence level (95%)
- E =allowable error ($\pm 10\%$ of the mean)
- s_h =standard deviation of stratum h
- n_h =number of samples allocated per stratum h

The number of plots actually established will be at least 10% greater than that determined using the sample size equation. This will allow for greater variability to occur in growth than measured in preliminary data and unexpected losses of permanent plots due to unforeseen events. The plots will be treated in the same way as other lands within the project boundary, e.g. during site and soil preparation, weeding, fertilization, etc and will be prevented from being deforested over the project period.

Plot Size

The size of the plots will ensure that all diameter classes of trees within the plots are sufficiently sampled at all stages of the project. It is expected that the plot size will be 400 m², however the exact size will be assessed during the preliminary data collection. Nested sample plots, in which smaller sampling units or nests of various shapes and sizes are located, are cost efficient for forest monitoring. It is expected that 3 sizes of nested plots will be used. The size of the tree determines in which nest it is measured. When trees attain the minimum size for one of the nests, they are measured in that nest. The exact size of the nests will be determined during preliminary data collection; however, Table 17 provides an example of nest sizes.

Table 17. Size of the plots or nests by stem diameter size

Stem Diameter (cm)	Circular Plot Radius (m)	Square Plot Dimensions (m)
5-20	4	7 x 7
20-50	11	20 x 20
> 50	20	35 x 35

Tree and Root Biomass

The aboveground and belowground carbon pools will be calculated from the area of each stratum and the mean carbon stocks in the aboveground and below ground biomass per unit area using the monitoring methodology. Strata to be used are as follow: reforestation (by barangay); agroforestry (by barangay).

The following allometric equations will be used to estimate biomass from the measured dbh of the trees. For roots, no direct measurement will be undertaken to determine the root biomass rather it will be estimated using the allometric equation developed by Cairns et al. 1997.

Forest Restoration Component

Allometric equations (Brown, 1997):

Biomass (kg) =EXP(-2.134+2.53*LN(dbh), for trees with dbh < 60 cm

Biomass (kg) = $42.69 - 12.8 \cdot (\text{dbh}) + 1.242 \cdot (\text{dbh})^2$, for trees with dbh 60-148 cm

$$ABD = \sum_{i=1}^{\text{all}} \left(\frac{10000}{a_i} \sum_{k=1}^{\text{all}} \text{Biomass}_k \right),$$

where a_i = area of nest in m^2 ; Biomass_k = biomass of each tree in the nest

Belowground biomass density (t/ha) = $\exp(-1.0587 + 0.8836 \cdot \ln ABD)$ (Cairns et al 1997)

Where:

Exp = exponential function of base e

Ln = natural logarithm

DBH = diameter at breast height (1.3 m above ground) in cm

ABD = aboveground biomass density in tons of biomass per hectare

Agroforestry Component

Aboveground biomass (kg):

Agroforestry shade trees general equation (Segura et al. 2006)

$$\text{Log}_{10} \text{Biomass} = -0.834 + 2.223 \cdot (\text{log}_{10} \text{DBH})$$

Inga species (Segura et al. 2006)

$$\text{Log}_{10} \text{Biomass} = -0.889 + 2.317 \cdot (\text{log}_{10} \text{DBH})$$

Other tree species (Brown et al. 1989b)

$$\text{Biomass} = \exp(-2.4090 + 0.9522 \cdot \ln(\text{DBH}^2 \cdot H \cdot S))$$

Belowground biomass (kg) (Cairns et al 1997):

$$\text{Belowground biomass (kg)} = \exp(-1.0587 + 0.8836 \cdot \ln ABD)$$

Where:

Exp = exponential function

Ln = natural logarithm

DBH = diameter at breast height (1.3 m above ground) in cm

H = height in m

S = specific gravity (wood density) in g/cm^3 or t/m^3

Biomass of the trees inside the sample plot will be summed and converted into tons/ha to get the biomass density.

Monitoring Frequency

Planting will take place in 2007-2009. The dbh (thus, the aboveground biomass, from it belowground biomass) will be measured annually. The first full verification of carbon benefit is scheduled in 2013. Thereafter, it will be every five years.

CL3.2 Commit to developing a full monitoring plan within six months of the project start date or within twelve months of validation against the Standards and to disseminate this plan and the results of monitoring, ensuring that they are made publicly available on the internet and are communicated to the communities and other stakeholders.

A full monitoring plan will be developed within twelve months of validation against the Standards. Results of the monitoring will be made available to the public through the internet. Likewise, such results will be communicated to the local communities and other relevant stakeholders.

Gen	Clim	Comm	Bio
CM1.		Required	

COMMUNITY SECTION

CM1. Net Positive Community Impacts

CM1.1 Use appropriate methodologies to estimate the impacts on communities, including all constituent socio-economic or cultural groups such as indigenous peoples (defined in **G1**), resulting from planned project activities. A credible estimate of impacts must include changes in community well-being due to project activities and an evaluation of the impacts by the affected groups. This estimate must be based on clearly defined and defensible assumptions about how project activities will alter social and economic well-being, including potential impacts of changes in natural resources and ecosystem services identified as important by the communities (including water and soil resources), over the duration of the project. The ‘with project’ scenario must then be compared with the ‘without project’ scenario of social and economic well-being in the absence of the project (completed in **G2**). The difference (i.e., the community benefit) must be positive for all community groups.

The asset-based livelihood framework that will generate net benefits guides the mobilization of community residents as primary stakeholders, with the technical assistance of the DENR, coordination and guidance of the local government units (municipal and community- or barangay-level) and support of other agencies (academe, business, technical and research centers and donors).

Net economic benefits include (1) increase in household income from (a) incentives (direct payments) for successful establishment and ensured growth of seedlings in reforestation and enhancement planting, and (b) benefit sharing from harvest of fruit trees in agro-forestry; (2) free seedlings as well as training in various techniques in forest establishment and management and agroforestry, soil and water conservation, mulching, pest control, and marketing); and (3) positive changes in environmental values, attitudes, and practices. These net economic and social benefits will stabilize agriculture as primary livelihood of upland communities, while regulating the use of forest resources for local needs and supplemental income.

Details of net benefits with the project are the following:

- Reforestation (1,800 hectares; up to 372 Family Participants)
 - Family Participants (FPs) are community residents within the project site that are involved in the reforestation activities. These participants will receive direct compensation for planting activities. At PhP4.50/seedling planted, the project will create short-term income for 372 Family Participants from labor input in planting 1,346,532 seedlings for reforestation and 120,000 trees for enhancement.
 - Family Participants will receive income as well for maintaining the seedlings once planted. FPs with maintained trees will earn PhP1.50/tree every quarter during the first year of planting to ensure that at least 80% of planted seedlings will mature.

- Agro-forestry (700 hectares; up to 628 Upland Farmers)
 - Farmers will receive income from the sale of fruits (mango and other fruit trees) that they plant and maintain. The project will provide fruit tree seedlings and skills training for growing fruit trees. The project targets to involve up to 628 upland farmers in the agroforestry activities, and an average participating agroforestry farmer is expected to earn PhP 6,369 (at PhP20/kg of mango fruit) from as early as Year 5 (2012). This will result from the mango fruit production expected from 40,000 seedlings of mango trees planted in 400 hectares, while another 180 hectares are expected to be planted with other fruit trees such as cacao and citrus. Cash crops will be intercropped in between fruit trees to increase their income further.
 - Reforestation Fund will be established from part of revenue from agroforestry sales, pursuant to the MOA between the project and agroforestry farmers. Part of this Fund will be made available for livelihood options through micro-financing. The rest of the Fund will be used for maintenance of existing plantation and expansion of plantation to new areas.
 - Farmers are expected to earn income from sales in other fruit trees, cacao, coffee and other crops, targeted to cover 180 hectares.
 - Remaining 120 hectares are for fuelwood plantation. The goal is to eliminate fuelwood extraction from natural forest stand.

- Introduction of rice-hull stoves and fuelwood plantation
 - The project will distribute rice-hull stoves to up to 1000 family participants. Rice-hull stoves uses rice hulls produced at nearby rice mill as fuel. Rice hull is available for free. Since this alternative cooking scheme reduces, if not eliminate, the need for purchasing fuelwood/charcoal and/or cutting of trees from the natural forest for fuelwood for cooking.
 - The project will also promote planting of fast-growing fuelwood trees within the settlement and in their agroforestry farms as source of fuelwood.
 - If these activities replaces the fuelwood the families have to purchase from the market, they will save up to PhP 450.00/month or 5,400/year (estimated at PhP50/bundle with an average of 9 bundles per month, based on the results of the interviews of 15 beneficiary families who received and used the alternative cooking stove for testing).
 - After 2 years of field testing, two rice-hull stove remain as candidate for adoption: “Rice Husk Quasi Gasifier Stove with Side-In Steam Injector for Household Use “ developed by Alexis T. Belonio of Central Philippines University, Iloilo City⁹ and the Mayon Turbo Ricehull Stove by Resource Efficient Agriculture Production (REAP) Canada.¹⁰
 - The project staff made an assessment of the availability of rice hull and the expected demand for rice hull which indicate that a combination of rice-hull stoves and fuelwood plantation is necessary.
 - The introduction of rice hull cooking stove as alternative for fuelwood needs a series of awareness campaign and consultations to inculcate with the participating farmers the

⁹ <http://www.bioenergylists.org/beloniosuperrh#navigation#navigation>.

¹⁰ http://www.reap-canada.com/bio_and_climate_3_3_1.htm

ultimate goals and objectives of having such intervention. At this stage, the project proponent is still assessing the durability and efficiency of these different types of model stove.

- Farmers and participants will receive training in various techniques in forest establishment and management, agroforestry, soil and water conservation, mulching, pest control, enterprise development, marketing of crops, cooperative management, and others
- Having a clear MOA with each farmer will strengthen social assets in terms of values and improved accountability roles of farmers in sustainable use of forest resources, as well as cooperation in governance
- Positive changes in practices and values to counter destructive resource use are expected to result from the project. There will be reduction in reliance on illegal logging as well as use of fuelwood and charcoal from natural forest, improved protection of habitats of threatened species, and improved management of soil and water.

Under the baseline scenario, the forest will continue to be reduced due to cutting trees for subsistence and commercial purposes, as well as due to conversion of land to upland farms and settlements through forest clearing. The baseline agricultural practice and livestock raising are expected to cause the land to degrade, resulting in soil and water problems. The project's activity will reverse the unsustainable trends to positive, increase income of the participating families, and build capacity. Thus, the project that realizes the above-listed benefits will bring net positive impacts to the community.

Institutional Sustainability of the Reforestation Fund

The reforestation fund mechanism depends largely in the development of the four cooperatives which serve as conduit in the attainment of the goals and objectives of the project. Therefore, this mechanism starts from setting up the legal identity and structure of the upland farmers' organization into cooperatives. Structurally, cooperatives would be composed of officers, staff and members. The project will provide capacity building interventions to establish a functional and sustainable People's Organization that can sustain the project development beyond 2013. Hence, to ensure the multidimensional development of these cooperatives that must be in place prior to Project phase out in 2013, several institutional and technical capability building activities are planned to be undertaken. The capacity building will address the different facets of institutional sustainability, including organizational strengthening, financial management, leadership, linkages with government and non-government agencies (such as the Cooperative Development Authority, which is mandated to support and guide cooperatives; Department of Agriculture, DENR, etc), technical capability enhancement, and livelihood & enterprise development.

CM1.2 Demonstrate that no High Conservation Values identified in **G1.8.4-6** will be negatively affected by the project.

Water supply, which has been identified as a HCV in the project zone will not be negatively affected by the project. Rather the project will help restore the forest cover and improve the water-holding capacity of the project site which serves as catchment area for the domestic water supply to the adjacent communities, Project activities are undertaken purposely to improve the forest cover to help minimize soil erosion and hazards due to grassfires, improve site conditions conducive to biodiversity. Project activities also include support to allow the communities improve their livelihood which do not require them to degrade the project zone.

Gen	Clim	Comm	Bio
CM2. Required			

CM2. Offsite Stakeholder Impacts

CM2.1 Identify any potential negative offsite stakeholder impacts that the project activities are likely to cause.

The identified potential negative impacts of the project include the displacement of gathering of wood for fuelwood and charcoal making, and animal grazing by local people. About 90% (or at least 1,000 households) of the population in the five barangays gather fuelwood from the project area, either for home use for cooking or for commercial sale. Nineteen animal owners use the project area for animal grazing. Both activities require permits from the local DENR office. Since these activities are incompatible with the goal of the project, the DENR will not issue permits for these activities. Project provides alternatives to fuelwood collection and charcoal making. The LGU of Peñablanca has established an ordinance to ban animal grazing within the project area.

CM2.2 Describe how the project plans to mitigate these negative offsite social and economic impacts.

With the project, illegal activities by local people will be the focus of heightened enforcement of forest protection laws which convey even more the message that the project site, much like other designated restricted areas within the PPLS, is not “open access”. The expected result is that some of these activities like firewood gathering/charcoal making and cattle/carabao grazing will be displaced and transferred somewhere else outside of the project site. To help adversely affected local people, at least the 1,000 target farmers and their families, involved in fuelwood collection to shift from cutting trees in the natural forest within the project site, and thereby mitigate their displacement which makes them continue tree cutting in offsite communities, the project provides the following mitigation measures:

- awareness raising campaign,
- provision of livelihood support in agroforestry,
- skills training for additional income-generating activities like seedling production, and skills for increased farm production and crop diversification,
- support for the establishment of fuelwood plantation, and
- support for the adoption of alternative cooking stove that make use of non-wood fuel like rice hull which are locally available and essentially considered as waste by-product of farming.

For some 332 grazing animals involving about 19 individual-owners [ownership ranges from 10-60 heads of animals], the project will help the owners negotiate a mutual arrangement with existing pasture lease holders in and around Peñablanca for the inclusion of their animals within the pasture lease areas. The animal owners can also apply for pasture lease areas with the assistance of the local DENR office and LGU Peñablanca who are partners in this project, and are by themselves mandated to facilitate the granting of such pasture lease agreements in appropriate locations in Peñablanca.

Primarily, the local government units at the municipal and barangays levels will be encouraged to complement these mitigation measures. Appropriate land use planning, monitored settlement

expansion, strengthening of farming as primary livelihood, and regulation of business enterprises are some of the aspects the local government units shall be engaged in through local policy development and advocacy, capacity enhancement, and strengthening of partnership between the public sector and private business.

CM2.3 Demonstrate that the project is not likely to result in net negative impacts on the well-being of other stakeholder groups.

The steps outlined above to mitigate adverse impacts to offsite stakeholders will lessen, if not totally eliminate, their severity and the net result of the project is expected to be very positive. The mitigation measures are clearly directed to provide long-term alternative solutions to the needs faced by the fuelwood collectors and owners of grazing animals. The fuelwood collectors will have increased income from agroforestry and more productive, efficient farming, and will have available alternative sources of fuelwood; animal owners will have secured pasture areas for their grazing animals. Thus, their displacement will not create any negative impacts to the well-being of offsite stakeholders.

Communal Fuelwood Plantation

Fuel wood collectors who do not have agro-forestry/farm will benefit from the communal fuelwood plantations established within the project zone. Communal fuelwood plantations were planted with combinations of fast growing fuelwood species like *Gliricidia sepium* (Kakawate), *Leucaena leucocephala* (Ipil-ipil) and *Cassia spectabilis* (Anchoan dilaw), for the purpose of reducing pressure on natural forests, which may include those outside the project area, caused by fuelwood demand. The project assists the community from identifying locations for additional fuelwood plantations to their establishment and drafting of management/utilization plans and maintenance. As part of their support, the municipal local government unit of Peñablanca will legislate an ordinance that will guide all the communities under its jurisdiction, not limited to those covered by the project, to adopt similar practice.

Alternative Cooking Scheme

To minimize dependency and demand of fuelwood, the project will be providing cooking stoves that makes more efficient use of fuelwood and/or that uses alternative materials for fuel. Several models of rice-hull stove are being tested for fuel efficiency and durability. The most efficient and cost-effective rice hull stove model will be procured and distributed to qualified beneficiaries wherein priorities are the fuelwood-dependent families.

The fuelwood stoves of improved fuel efficiency will also be provided to part of the project area where rice hull is not readily available, such as Mangga. Several models have been distributed for testing also.

Alternative Income Source

Those who collect fuelwood for sale can find alternative income source by participating in the project reforestation activities, from seedling production to planting and maintenance. They can earn income for labor of planting. Seedlings raised in their backyard (outside the project's nurseries) can be purchased by the project or sold to market outside the project. Skills training on seedling production are provided to the cooperative members. All income generating activities will also be provided through the cooperatives. Thus they are encouraged to become members of the cooperatives, which in turn organizationally strength the cooperatives to achieve better service.

Pasture Lease Areas

Animal grazing has been banned after the area was proclaimed as protected area in 1994 (later expanded to become PPLS in 2003). This policy has been reinforced by a municipal resolution and barangay ordinances to disallow astray animals in the project area. Grazing animals in within the project area must now be contained in enclosures or dislocated outside the project boundary. The project assists the animal owners in the latter by facilitating the discussion between cattle owners and pasture land owners.

There are two approved Pasture Lease Agreements (PLAs), and two PLAs under processing for approval by DENR. A Communal Pasture is located in Cabasan. These designated pasture areas can easily accommodate the less than 400 heads of cattle currently grazing inside the project area.

CI is facilitating the discussions between cattle owners and Pasture Lease Agreement (PLA) holders. Existing practice within the community is only verbal agreement between PLA holders and those who want to combine their animals in the legitimate areas. The first condition is the payment of the annual government due of Php50.00 per head for the use of the pasture land, regardless of the ages and sizes of animals. Second, the users must participate in all the activities inside the pasture area like fencing and maintenance.

Through this arrangement, the cattle owners gain legal and secured pasture areas for their grazing animals, and their well-being is improved.

Gen	Clim	Comm	Bio
CM3. Required			

CM3. Community Impact Monitoring

CM3.1 Develop an initial plan for selecting community variables to be monitored and the frequency of monitoring and reporting to ensure that monitoring variables are directly linked to the project's community development objectives and to anticipated impacts (positive and negative).

At project start, several priority variables were established in the benchmark as being important for periodic monitoring, assessment and evaluation at both the community and household levels. The community level compares across the five communities that are project sites, while the household level compares Family Participants (FP) against Non-Participant Families. These variables include changes in household/farm level income from various sources, population change from in- or out-migration, quality of housing, access to health and social services, and improvement in eco-governance.

To ensure that project objectives benefit the households who adopt the recommended changes in forestry values and behavior, and in return expand project benefits to improve the quality of life in the communities, monitoring specifically covers data on the following indicators (details of some selected indicators are in Appendix 9):

A. At the Community level

1. No. of household with improved tenurial status (project requirement as side benefit of project)
2. Total community income from direct use of forest resources (logging, fuelwood/charcoal, hunting) vs. agriculture (as primary livelihood of upland communities, while regulating the use of forest resources for local needs and supplemental income)
3. Improvements in physical infrastructure and facilities for agriculture
4. Community health facilities and services
5. Skills upgrading for economic improvement
6. No. of local policies crafted for forest conservation
7. Status of implementation and results of local policies
 - a. Enforcement of strict regulations

B. At the level of Family Participants and Family Non-Participants (based on representative sample)

1. Income from :
 - b. cash incentives for successful establishment of trees, ensured growth of seedlings in reforestation and enhancement planting
 - c. share in harvest of fruit trees in agro-forestry
2. No. of FPs and FPs benefitted and quantity of benefits accessed :
 - a. with free seedlings received
 - b. with training accessed in techniques in forest establishment and management (SALT, soil and water conservation, mulching, pest control, enterprise development, marketing of crops, cooperative management, and others)

3. Positive changes in environmental values, attitudes and practices
 - a. No. of families making and selling charcoal
 - b. No. of families using fuelwood and/or charcoal from protection forest
 - c. No. of families that shift to alternative cooking scheme (stove)
4. Income from making and selling charcoal (from local natural forest)

Data sets generated by mandated governance units as take-off for monitoring specific socio-economic variables are scaled up and enhanced by information on asset-based attributes and dynamics associated with knowledge, awareness and practice (KAP) of individual households in forest conservation. Institutional analysis as approach in M&E prioritizes these data that are reflective of regular and normative yet the most critical actions of multi-stakeholders to protect the natural forest. The monitoring scheme can guide investments in reforestation.

Iteratively handled research methods in monitoring are spread out over the year: preparatory steps (updating tools, developing modular instruments as needed) are done in the first quarter, followed by monitoring of the project's socioeconomic aspects at the second quarter through a sample survey, enriched in the third quarter by Focused Group Discussions and semi-structured interviews, with the review of the documentation on project implementation. Sharing and validating the research findings is set for the fourth quarter, including the discussion of issues, recommendations and indicative planning on the complementation of efforts in community development.

CM3.2 Develop an initial plan for how they will assess the effectiveness of measures used to maintain or enhance High Conservation Values related to community well-being (G1.8.4-6) present in the project zone.

The watershed value of the project zone is considered as the ecosystem service contributing to the well-being of the communities (G1.8.4). The project is already implementing the plan to monitor and assess project impact to the watershed under the Joint Research and Development component of the project. The watershed research covers monitoring and assessment indicators to relate the reforestation, enhancement planting and agroforestry activities of the project to changes or improvements of the watershed functions of the project site which affects especially the quality and quantity of the water for the domestic and farming use of the local communities. In order to determine the impact of reforestation, agro-forestry and enhancement planting activities to watershed in the project zone, monitoring indicators have been identified, and their methods and frequencies specified (Table 18). Changes or development of the watershed within the project zone will be documented following this scheme.

In due time, area within the project zone will improve and protect this watershed, which will bring additional critical ecosystem services for communities, such as minimization of soil erosion.

Table 18. Watershed monitoring and assessment indicators.

Indicators	Monitoring Set-Up	Monitoring Frequency
1. Hydrometeorological	One auto recording weather station (rainfall, temperature, humidity, ground temperature)	Continuous data downloading
2. Soil infiltration rate	Sprinkler method using 50cmx50cm plots representing different soil conditions in the project site	Twice a year: Nov. (rainy season) and March (dry season)
3. Water extreme flow level	Marked three water level indicators in two creeks/rivers	Every storm/typhoon or prolonged rain
4. Water table level	Two water wells; water table depth using water table measure	Once a month during the dry season (January to August)
5. Dry spring	10 dry springs monitored for absence of presence of water	Once a month during the dry season (January to August)
6. Surface soil erosion	Two experimental adjacent plots, one subplot planted with tree seedlings; other subplot unplanted; photo documentation comparison over time	Twice a year (November and March)
7. Soil sedimentation rate	Concrete weir structure in Bugatay creek to capture sediments in stream flow	Monthly during the rainy season (September to December) and periodic checking during dry months
8. Soil fertility	Laboratory analysis of soil samples for N,P,K, OM, and soil fauna.earthworm counts weight.	Every third March

CM3.3 Commit to developing a full monitoring plan within six months of the project start date or within twelve months of validation against the Standards and to disseminate this plan and the results of monitoring, ensuring that they are made publicly available on the internet and are communicated to the communities and other stakeholders.

The full monitoring plan is in place as of Year 2 (2009). Progress in project implementation is disseminated in a community-wide meeting in each site. Municipal-level presentation of monitoring results is undertaken similarly. The scheme to disseminate monitoring results has yet to be set up electronically.

The periodic monitoring, assessment and evaluation at both the community and household levels will be spearheaded by CIP. Data sets pertaining to the selected socio-economic indicators (as shown in CM3.1) will be collected annually using combinations of focus group discussion, semi-structured interviews, key informant interviews and observations. Random sampling will be done to gather 30 family-respondents. Local enumerators will be hired, oriented and trained to undertake data collection and analysis, the results of which will have to be presented and validated with the communities.

Gen	Clim	Comm	Bio
B1.			Required

BIODIVERSITY SECTION

B1. Net Positive Biodiversity Impacts

B1.1 Use appropriate methodologies to estimate changes in biodiversity as a result of the project in the project zone and in the project lifetime. This estimate must be based on clearly defined and defensible assumptions. The ‘with project’ scenario should then be compared with the baseline ‘without project’ biodiversity scenario completed in G2. The difference (i.e., the net biodiversity benefit) must be positive.

The result of the flora survey have shown that the dominant vegetation within the project site is characterized by *parang* vegetation, which is typical of formerly forested areas that has been logged over and has been used as grazing areas for ruminants. Hunting, habitat loss and fragmentation are identified as the major causes of biodiversity loss. Recovering the forest using native tree species means restoring the habitat conditions for the assemblages of species that may indicated by the abundance of forest-dwelling species. Forest patches, remnants of the original vegetation cover, and secondary forests were also found scattered within the project site that has provided refugia to some of the forest dependent species of birds and bats observed within the project site. Presence of two endemic species of birds (*Bubo philippinensis* and *Anas luzonica*) that are both globally threatened, one of which is forest dependent (*Bubo philippinensis*) and the other a wetland species, is an indication that the area supports important biodiversity. Endemic species in adjacent areas that were not observed within the project site now are expected to migrate into the project area if habitat conditions are improved as a result of the project.

Current activities undertaken to enhance and restore the forested habitat within the project site is foreseen to have a positive impact in both the flora and faunal diversity within the project site. Monitoring will have to be undertaken to document changes in the species composition within the project site. This will also provide valuable insight on the rates of colonization of species when actual changes in habitat occur. It is therefore important to identify permanent transects for plants and survey sites for birds and bats that will be regularly monitored to be able to determine the impacts of project activities.

Selection of the monitoring sites was initiated by determining what project activities were being initiated within the established transects and/or surveys sites. For the plants, six transect sites were chosen, three transects in reforestation areas and the remaining three located within a reforestation and agroforestry area. For the birds and bats, three monitoring survey sites was established, one in an enhancement planting area, another in a reforestation area and the last within a reforestation and agroforestry area.

Assessments and monitoring of the birds and bats species richness, composition and abundance to document biodiversity trends within the project area will demonstrate an overall net positive impact on biodiversity as a result of the project. The project will restore the forests and enhance forest habitat connectivity that will facilitate movement and dispersal of the endemic and/or threatened species. Since deforestation and forest fragmentation are identified as one of the major threat to many species in the region, restoration of forest by itself shall be considered as benefit to biodiversity. Species reaction to the habitat change will be a clear proof of such

contribution. It is expected over time that the number of forest-dependent species will increase relative to the number of grassland and non-forest tolerant species of birds and bats. The project will be able to demonstrate significant net positive biodiversity impact in comparison to the baseline biodiversity conditions (see Table 19).

Table 19. Summary of net biodiversity benefits provided by the project.

Without-project scenario	With-project scenario	Net effect
Diversity of forest dependent species, many of which are endemic, will remain the same or possibly decrease	Reforestation will increase area of cover and forage for the forest dependent species; encourage recolonization from remaining forest patches in the vicinity	Positive
The loss of the remaining patches of native forest leading to local disappearance of seed-dispersing wildlife that would otherwise help natural forest regeneration as well as refuges and habitat of the identified threatened and endemic species	Remnant, fragmented forest patches will be connected with new planted forest, forming continuous larger patch of forest. Wide range of species being threatened by loss of forest, from Philippine eagle, to Ashy ground thrush and Pygmy forest frog, will benefit from this change.	Positive
Population of threatened tree species continue to decline	Project will increase the population of threatened tree species by using their seedlings in reforestation	Positive
Agriculture dominates the landscape	Natural habitat increases in the landscape	Positive
Increase in disturbed sites are prone to negative impact of invasion by non-native, invasive species of plants and animals	Forest will provide more stable conditions, making it harder for pioneer-type invasive alien species to become established.	Positive

B1.2 Demonstrate that no High Conservation Values identified in **G1.8.1-3** will be negatively affected by the project.

The project is designed to enhance and restore the forest habitat within the project area. In fact, among the nine threatened floral species recorded within the project site, five (*Artocarpus blancoi*, *Macaranga grandifolia*, *Azelia rhomboidea*, *Pterocarpus indicus. forma indicus* and *Vitex parviflora*) are used for reforestation. Majority of the endemic and threatened species of fauna are forest-dependent species as presented in Table 20 Therefore the project will only have a positive impact on these species and it is not anticipated or expected that there will be any negative impacts.

Table 20. List of relevant species recorded within the PPLS

Scientific Name	Common Name	Distribution and Conservation Status	Ecology/Habitat
<i>Pithecophaga jefferyi</i>	Philippine Eagle	Philippine Endemic- CR	Prefers primary forest but occurs in residual gallery forest
<i>Oriolus isabellae</i>	Isabela Oriole	Luzon Endemic- EN	Canopy of forest (especially bamboo forest) and forest edge Status changed to CR in the 2009 IUCN Red List
<i>Platymantis taylori</i>	Taylor's Igorot Frog	Luzon Endemic- EN	Inhabits the forest floor stratum in lower montane and lowland forests. Breeds and makes nests in leaf litter; direct developer.
<i>Acerodon jubatus</i>	Golden-crowned Fruit Bat	Philippine Endemic - EN	Primary and secondary lowland forest up to 1100 m. Some roosts reported from mangrove and on small islands (Hoogstraal, 1951; Rabor, 1986).
<i>Pelochelys cantorii</i>	Cantor's Soft-shelled Turtle	Widespread- EN	This is found in freshwater streams and deep, slow-moving rivers, often far inland.
<i>Anas luzonica</i>	Philippine Duck	Philippine Endemic - VU	marshes and inland waters
<i>Bubo philippensis</i>	Philippine Eagle Owl	Philippine Endemic - VU	forest at lower elevations
<i>Ducula carola</i>	Spotted Imperial-pigeon	Luzon Endemic- VU	forest and forest edge from the lowlands to 2000 m.
<i>Otopteropus cartilagonodus</i>	Luzon Pygmy Fruit Bat	Luzon Endemic - VU	Known only from primary and well-developed secondary forest, in lowland, montane, and mossy forest from 200 m to 1900 m. Abundance is low to moderate, usually most common at middle elevations Status changed to LC in the 2009 IUCN Red List
<i>Haplonycteris fischeri</i>	Philippine Pygmy Fruit Bat	Philippine Endemic - VU	Common in primary forests, especially at middle elevations; rare in secondary forest, and absent in entirely agricultural areas. It occurs from about 150 m to 2250 m; abundance usually increases with elevation up to about 1500 m, and then declines: Status changed to LC in the 2009 IUCN Red List
<i>Spizaetus philippensis</i>	Philippine Hawk-eagle	Philippine Endemic - VU	lowland and mid-mountain forest

<i>Sus philippensis</i>	Philippine Warty Pig	Philippine Endemic - VU	Formerly abundant from sea level to at least 2800 m, in virtually all habitats (Rabor, 1986); now common only in remote forests (Danielsen et al., 1994; Heaney et al., 1991, in press).
<i>Ptilinopus marchei</i>	Flame-breasted Fruit-dove	Luzon Endemic- VU	Resident of primary forest from 500-2500 m.
<i>Varanus olivaceus</i>	Monitor Lizard	Luzon Endemic - VU	The hillsides frequented by the lizard are covered with thick rainforest and have many cliffs and rock outcrops. Although its total range is small (about 5000km ²) Gray's monitor appears to be common in many areas. However its very secretive habits and cryptic colouration enable it to evade detection.

B1.3 Identify all species to be used by the project and show that no known invasive species will be introduced into any area affected by the project and that the population of any invasive species will not increase as a result of the project.

Indigenous species that can be used for the reforestation and forest enhancement activities is identified (Table 21). Availability and abundance of seedlings will be the major consideration for the actual indigenous species to be planted. Additional pioneer indigenous species were also identified as potential reforestation material based on the result of the baseline flora survey conducted within the project site (Table 22). The project will use no known invasive species.

The local communities are encouraged to collect seeds and indigenous wildlings (see appendix 10 for species list) . Seeds and wildlings will be raised in established nurseries for future use as reforestation planting materials. Increasing the diversity of indigenous species to be planted will supplement the number of seedlings needed by the project. The natural forest such as the one in Barangay Nanguilatan (see B1.1) is a good source of propagules and seedlings for natural forest regeneration within the project site.

Since the project site is mostly marginal grasslands and early re-growths, the approach will be to initiate colonization of open grasslands by fast-growing indigenous pioneering trees. These species are nitrogen fixers, soil-binders, and fruiting trees that will attract frugivore wildlife species to assist in seed dispersal. These tree species could provide enough shade to suppress grasses and serve as ‘nurse trees’ to protect additional, slower-growing native seedlings. As project progresses and more indigenous species seedlings are raised, mortalities of planted seedlings will be replaced by seedlings of other (shade tolerant) indigenous species to promote diversification.

Table 21. List of indigenous species that can potentially be used for reforestation and enhancement planting

Family	Scientific Name	Common Name	Distribution and Conservation Status
Anacardiaceae	<i>Buchanania arborescens</i>	Balinghasai	Widespread
Anacardiaceae	<i>Semecarpus cuneiformis</i>	Ligas	Widespread
Apocynaceae	<i>Alstonia macrophylla</i>	Batino	Widespread
Apocynaceae	<i>Alstonia scholaris</i>	Dita	Widespread (Medicinal Plant)
Apocynaceae	<i>Ochrosia ackeringae</i>		Widespread
Bignoniaceae	<i>Radermachera grandiflora</i>		Widespread
Bombacaceae	<i>Samalia malabarica</i>	Buboy-gubat	Widespread
Caesalpiniaceae	<i>Bauhinia malabarica</i>	Alibangbang	Widespread
Combretaceae	<i>Terminalia citrine</i>	Kalumpit	Widespread
Dipterocarpaceae	<i>Shorea astylosa</i>	Yakal	Widespread- Critically Endangered (IUCN 2007)
Ebenaceae	<i>Diospyros blancoi</i>	Kamagong	Widespread- Critically Endangered (IUCN 2007)
Euphorbiaceae	<i>Antidesmas bunius</i>	Bignai	Widespread
Euphorbiaceae	<i>Bischofia javanica</i>	Tuai	Widespread
Euphorbiaceae	<i>Macaranga grandifolia</i>	Takip Asin	Widespread- Vulnerable (IUCN 2007)
Euphorbiaceae	<i>Macaranga tanarius</i>	Binunga	Widespread
Euphorbiaceae	<i>Melanolepis multiglandulosa</i>	Alim	Widespread
Fabaceae	<i>Pterocarpus indicus</i>	Narra	Widespread- Vulnerable (IUCN 2007)/Critically Endangered (National Red List)
Leguminosae	<i>Azelia rhomboidea</i>	Tindalo	Widespread- Vulnerable (IUCN 2007)/Endangered (National Red List)
Leguminosae	<i>Intsia bijuga</i>	Ipil	Widespread
Leguminosae	<i>Parkia timoriana</i>	Kupang	Widespread
Mimosaceae	<i>Samanea saman</i>	Rain Tree	Widespread
Moraceae	<i>Artocarpus altilis</i>	Rimas	Widespread
Moraceae	<i>Artocarpus blancoi</i>	Antipolo	Widespread- Vulnerable (IUCN 2007)
Moraceae	<i>Broussonetia luzunica</i>	Himbabao	Widespread
Moraceae	<i>Ficus benjamina</i>	Salisi	Widespread
Moraceae	<i>Ficus minahassae</i>	Hagimit	Widespread
Moraceae	<i>Ficus nota</i>	Tibig	Widespread
Moraceae	<i>Ficus pseudopalma</i>	Niog-niogan	Endemic
Moraceae	<i>Ficus septica</i>	Hauili	Widespread
Myrtaceae	<i>Syzygium cumini</i>	Duhat	Widespread
Rubiaceae	<i>Neonauclea media</i>	Wisak	Endemic
Sterculiaceae	<i>Heritiera sylvatica</i>	Dungon	Widespread
Tiliaceae	<i>Diplodiscus paniculatus</i>	Balobo	Endemic - Vulnerable (IUCN 2007)
Verbenaceae	<i>Vitex parviflora</i>	Molave	Widespread- Vulnerable (IUCN 2007)/Endangered (National Red List)

Table 22. List of pioneer indigenous species observed within the project site.

Family	Scientific Name	Common Name	Distribution and Conservation Status
Anacardiaceae	<i>Semecarpus cuneiformis</i>	Ligas	Widespread
Apocynaceae	<i>Alstonia macrophylla</i>	Batino	Widespread
Apocynaceae	<i>Ochrosia ackeringae</i>		Widespread
Apocynaceae	<i>Tabernaemontana pandacaqui</i>	Pandakaki	Widespread
Araliaceae	<i>Polyscias nodosa</i>	Malapapaya	Widespread
Bignoniaceae	<i>Radermachera grandiflora</i>		Widespread
Burseraceae	<i>Canarium asperum</i>	Pagsahingin	Widespread
Celastraceae	<i>Gymnosporia spinosa</i>		Widespread
Ebenaceae	<i>Diospyros pilosanthera</i>	Bolong-eta	Widespread
Euphorbiaceae	<i>Acalypha caturus</i>	Migtanong-puso	Widespread
Euphorbiaceae	<i>Antidesma ghaesembilla</i>	Binayoyo	Widespread
Euphorbiaceae	<i>Drypetes littoralis</i>	Bato-bato	Widespread
Euphorbiaceae	<i>Drypetes longifolia</i>	Balikbikan	Widespread
Euphorbiaceae	<i>Securinega virosa (syn. Flueggea virosa)</i>		Widespread
Euphorbiaceae	<i>Glochidion luzonense</i>	Apaped	Widespread
Euphorbiaceae	<i>Glochidion phyllanthoides</i>	Malabagna	Endemic
Euphorbiaceae	<i>Glochidion urophylloides</i>	Halakan	Endemic
Euphorbiaceae	<i>Macaranga grandifolia</i>	Takip-asin	Endemic
Euphorbiaceae	<i>Macaranga tanarius</i>	Binunga	Widespread
Euphorbiaceae	<i>Mallotus philippensis</i>	Banato	Widespread
Euphorbiaceae	<i>Melanoplepis multiglandulosus</i>	Alim	Widespread
Flacourtiaceae	<i>Casearia grewiaefolia</i>	Kaluag	Widespread
Flacourtiaceae	<i>Scolopia luzonensis</i>	Aninguai	Widespread
Hypericaceae	<i>Cratoxylum sumatranum ssp. blancoi</i>	Guyong-guyong	Widespread
Hypericaceae	<i>Cratoxylum sumatranum ssp. sumatranum</i>	Paguringon	Widespread
Lauraceae	<i>Litsea glutinosa</i>	Sablot	Widespread
Leeaceae	<i>Leea aculeata</i>	Amamali	Widespread
Leeaceae	<i>Leea guineensis</i>	Mali-mali	Widespread
Leguminosae	<i>Albizia procera</i>	Akleng-parang	Widespread
Leguminosae	<i>Albizia saponaria</i>	Bahai	Widespread
Leguminosae	<i>Archidendron scutiferum</i>	Anagap	Endemic
Leguminosae	<i>Caesalpinia latisiliqua</i>		Widespread
Leguminosae	<i>Erythrina variegata (syn. E. orientalis)</i>	Dapdap	Widespread
Leguminosae	<i>Moghania macrophylla</i>		Widespread
Leguminosae	<i>Moghania strobilifera</i>		Widespread
Leguminosae	<i>Phyllodium pulchellum</i>		Widespread
Loganiaceae	<i>Buddleja asiatica</i>	Taliknono	Widespread
Lythraceae	<i>Lagerstroemia speciosa</i>	Banaba	Widespread
Melastomataceae	<i>Melastoma malabathricum</i>	Malatungau	Widespread
Meliaceae	<i>Aglaia cumingiana</i>	Alauhau	Widespread
Meliaceae	<i>Aphanamixis polystachya</i>	Kangko	Widespread

Family	Scientific Name	Common Name	Distribution and Conservation Status
Meliaceae	<i>Cipadessa baccifera</i>	Bieum	Widespread
Meliaceae	<i>Dysoxylum gaudichaudianum</i>	Igyo	Widespread
Meliaceae	<i>Sandoricum vidalii</i>	Wild Santol	Endemic
Moraceae	<i>Artocarpus blancoi</i>	Antipolo	Endemic
Moraceae	<i>Artocarpus ovatus</i>	Kubi	Endemic
Moraceae	<i>Artocarpus treculianus</i>	Pakak	Endemic
Moraceae	<i>Broussonetia luzonica</i>	Himbaba-o	Endemic
Moraceae	<i>Ficus magnoliifolia</i>	Kanapai	Widespread
Moraceae	<i>Ficus minahassae</i>	Hagimit	Widespread
Moraceae	<i>Ficus nota</i>	Tibig	Widespread
Moraceae	<i>Ficus pseudopalma</i>	Niog-niogan	Endemic
Moraceae	<i>Ficus septica</i>	Hauli	Widespread
Moraceae	<i>Ficus ulmifolia</i>	Is-is	Endemic
Moraceae	<i>Ficus variegata</i>	Tangisang-bayawak	Widespread
Moraceae	<i>Streblus asper</i>	Kalios	Widespread
Moraceae	<i>Streblus ilicifolius</i>	Kuyos-kuyos	Widespread
Myrsinaceae	<i>Ardisia pyramidalis</i>	Aunasin	Widespread
Myrtaceae	<i>Syzygium spp.</i>		Widespread
Olacaceae	<i>Chionanthus ramiflorus</i>	Karaksan	Widespread
Olacaceae	<i>Olax imbricate</i>		Widespread
Palmae	<i>Caryota maxima (syn. C. rumphiana)</i>	Pugahan	Widespread
Pittosporaceae	<i>Pittosporum pentandrum</i>	Mamalis	Widespread
Rhizophoraceae	<i>Carallia brachiata</i>	Bakawan-gubat	Widespread
Rosaceae	<i>Prunus arborea</i>		Widespread
Rosaceae	<i>Prunus marsupialis</i>	Amugan	Endemic
Rubiaceae	<i>Canthium monstrosum</i>	Tadiang-anunang	Widespread
Rubiaceae	<i>Nauclea orientalis</i>	Bangkal	Widespread
Rubiaceae	<i>Neonauclea reticulata</i>	Malauisak	Widespread
Rubiaceae	<i>Pavetta indica</i>		Widespread
Rubiaceae	<i>Psychotria gitingensis</i>		Endemic
Rubiaceae	<i>Psychotria luzoniensis</i>	Katakpo	Endemic
Rubiaceae	<i>Tarenna cumingiana</i>		Widespread
Rubiaceae	<i>Wendlandia luzoniensis var. membranifolia</i>		Widespread
Rutaceae	<i>Lunasia amara</i>	Lunas	Widespread
Rutaceae	<i>Micromelum compressum var. inodorum</i>	Tulibas-mabolo	Endemic
Rutaceae	<i>Toddalia asiatica</i>	Bugkau	Widespread
Sapindaceae	<i>Alectryon glaber</i>	Ibu	Widespread
Sapindaceae	<i>Guioa koelreuteria</i>	Alahan	Widespread
Sapindaceae	<i>Harpullia arborea</i>	Uas	Widespread
Sapindaceae	<i>Lepisanthes tetraphylla</i>	Sarakag	Widespread
Sterculiaceae	<i>Helicteres hirsuta</i>		Widespread
Thymelaeaceae	<i>Wikstroemia sp.</i>		Widespread
Tiliaceae	<i>Colona serratifolia</i>	Anilao	Widespread
Tiliaceae	<i>Grewia eriocarpa</i>		Widespread

Family	Scientific Name	Common Name	Distribution and Conservation Status
Urticaceae	<i>Leucosyke capitellata</i>	Alagasi	Widespread
Urticaceae	<i>Villebrunea trinervis</i>	Alilaua	Widespread
Verbenaceae	<i>Callicarpa formosana</i>		Widespread
Verbenaceae	<i>Clerodendrum minahassae</i>	Bagawak	Widespread
Verbenaceae	<i>Premna odorata</i>	Alagao	Widespread
Verbenaceae	<i>Vitex parviflora</i>	Molave	Widespread
Verbenaceae	<i>Vitex quinata</i>		Widespread

B1.4 Describe possible adverse effects of non-native species used by the project on the region's environment, including impacts on native species and disease introduction or facilitation. Project proponents must justify any use of non-native species over native species.

The project will only use indigenous species, in particular those that are found in forests in the region. Only exception is the use of kakawate (*Gliricidia sepium*), which is native to Central America, as live stakes to indicate the location of planted seedlings of indigenous species. Because of its coppicing ability and as fuelwood, kakawate is also promoted to be planted as fuelwood species within the agroforestry farms of project participants and in their communal fuelwood plantation areas in connection with the project's objective of providing them with alternative source of wood energy to cutting from the natural forests.

The kakawate has been naturalized in this region and other parts of the country due to its widespread distribution and its popular use as live fence. There are no foreseen negative impacts in the use of this species. Furthermore, once the indigenous seedlings are well established in the field, *G. sepium* will be cut and used as fuelwood. Its population will be kept under control.

There are benefits of using kakawate for reforestation. Kakawate will initially serve as nurse trees to provide shade. Being a legume, its nitrogen fixing capability will enrich the soil, and facilitates the establishment and growth of the indigenous seedlings planted (Elevitch and Francis, 2006).

B1.5 Guarantee that no GMOs will be used to generate GHG emissions reductions or removals.

No GMOs will be used by the project to generate GHG emissions reductions or removals.

Gen	Clim	Comm	Bio
B2. Required			

B2. Offsite Biodiversity Impacts

B2.1 Identify potential negative offsite biodiversity impacts that the project is likely to cause.

One potential negative offsite biodiversity impact of the project arises from the collection of wildlings from forests located outside or adjacent to, and within the project site. The project has arrangement with the project participants that they can raise planting materials needed in reforestation from wildlings they can collect to augment seedling production in the project nurseries especially during the first year of reforestation when there about 333,250 seedlings needed. Wildlings raised by the community will also be purchased by the project.

If not done properly by the community collectors, the negative effect of collecting wildlings would result to reducing available in situ reproductions that may delay or hinder the capacity of these forest sources to naturally regenerate themselves. At worst, wildling collection may further degrade these forests.

Another potential source of negative offsite biodiversity impact would come from the application of chemical flower inducers and pesticides for the production of mango in the Agroforestry component of the project. Upland farmer-participants are to plant a total of about 40,000 mango trees and managed on a backyard scale in their respective upland farms [where each farmer may have an average of less than 100 mango trees]. In order to maximize the production of mango, chemical flower inducers such as potassium nitrate or calcium nitrate as well as inorganic pesticides and fungicides are commonly used in the mango industry. While no specific studies in the mango industry is available for citation on biodiversity but more on adverse effects to humans, theoretically the usage of these chemicals may kill insects and other organisms forming part of the food base for a lot of wildlife species and also to other species in the food chain.

B2.2 Document how the project plans to mitigate these negative offsite biodiversity impacts.

In order to mitigate the negative impact of wildling collection, as stated in B.2.1 CI Philippines and DENR will train and guide local communities-collectors that signified interest in raising wildlings of indigenous species on the proper collection methods, identify areas and species that may be collected in secondary forest adjacent and within project site that were observed to have abundant wildlings (See Appendix 11 PPSRP Reforestation Manual of Operations, section 1.6 for the wildling collection guideline). Appendix 11 section 1.6 shows the list of species known in the site recommended for collection by the community. In the absence of an approved national and local written guideline with regard to the collection of wildlings, the project has developed its own version of wildling collection guidelines which was based on the proposed draft wildling collection guideline by the DENR. The project's manual on wildling collection will serve as guide for all project staff and wildling collectors Local knowledge will also be used to identify areas as source of wildling.

To mitigate the negative impact of chemical flower inducers, pesticides, and fungicides to offsite biodiversity, the project will promote the use of organic-based counterparts which are already

available in the market. For pest management, the project will adopt the integrated pest management (IPM) technology which the government has been promoting, more so now in the light of concern for environment against pollution and the costly prices of chemical farm inputs. For instance, organic-based preparations of pesticides technology or field guide are available that the project can adopt. In anticipation, however, to extreme cases where pest infestation may reach the threshold level and chemical use is unavoidable, the farmers will be trained and properly guided in the use of appropriate chemicals.

B2.3 Evaluate likely unmitigated negative offsite biodiversity impacts against the biodiversity benefits of the project within the project boundaries. Justify and demonstrate that the net effect of the project on biodiversity is positive.
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With the project, and with plans to mitigate the identified adverse offsite biodiversity impacts, the project is seen to generate net positive impact to biodiversity.

Using indigenous and non-invasive species of plants for reforestation, the project promotes better biodiversity than using fast growing exotic species. Wildling collection even helps accelerate forest regeneration process by helping the forest disperse its wildlings. In addition, the project also provides additional protection to the area allowing the natural succession and regeneration process to occur and eventually provides refuge to wildlife species. Furthermore, connecting forest fragments through reforestation and managed agroforestry farm landscapes will also help hasten the regeneration process as local wildlife species such as frugivorous birds and bats that help in seed dispersal will be able to move from one fragment to the other thus restoring the natural habitat of the endemic species.

By providing the favored habitat for a diverse species of insectivorous birds and bats, these species will serve as biological control for many insect pests by helping control insect population in the area and prevent them from becoming pest to fruit trees. This also helps the community in the production of mango and other fruit trees they planted.

Gen	Clim	Comm	Bio
B3. Required			

B3. Biodiversity Impact Monitoring

B3.1 Develop an initial plan for selecting biodiversity variables to be monitored and the frequency of monitoring and reporting to ensure that monitoring variables are directly linked to the project's biodiversity objectives and to anticipated impacts (positive and negative).

Monitoring indicators for biodiversity are shown below (Table 23). The monitoring will be conducted by Conservation International Philippines together with local communities and DENR.

Fauna monitoring will be concentrated only on birds and bats. These two groups of animals were chosen since they are important indicators of biodiversity and their habits make them practically measurable using the least amount of equipment and effort. They can be easily detected and composition, distribution and abundance of birds and bats are highly influenced by habitat availability. Monitoring sites were selected in areas where each type of project activities (enhancement planting, reforestation and agroforestry) being undertaken is represented. Three monitoring sites have been selected for the birds and bats survey to be conducted twice every year, during the dry and wet season (Figure 16). A combination of transect and mist-netting will be used for birds while only mist-netting will be used to monitor bats. These methods will allow us to detect changes in relative abundance among sites or habitats and determine/evaluate response of species in changes in habitat/forest structure within the project site.

For plants, six transect sites have been identified (Figure 17) which will be monitored annually to document floristic changes. Braun-Blanquet releve method will be used.

It is expected that the project will enhance the native biodiversity through the creation and/or enhancement of forested habitats, which will over time increase the numbers and richness of both plant and animal species relative to the current condition in the project area. Increase in the occurrence of endemic species and the maintenance of the populations of threatened species is expected including the subsequent decrease in grassland and other non-forest tolerant species.

Habitat conditions will be monitored by fixed-point photography. This method will allow us to track changes in vegetation cover by taking photos in several locations within the project area at a fixed point at the onset of the project and every year thereafter. Land-cover map will be produced from remote sensing data every three years to monitor changes in habitat boundaries.

To complement the monitoring of biodiversity and habitat conditions, the DENR-adopted Biodiversity Monitoring System (BMS) will also be used (see DENR. 2000. Department Administrative Order No 2000-13). BMS is a rapid appraisal, community-based approach that makes use of techniques such as focus group discussion and keeping field diaries which are not only cost effective but also contributes to more sound conservation outcome (Danielsen, 2007). Local communities will be trained by the project to conduct BMS with the technical support of DENR partner.

Table 23. Indicators and methods to be used in the monitoring biodiversity impacts of the project.

Indicator	Data Set	Method	Remarks
Change in habitat type boundaries/ Change in total area of a particular habitat type	Remote sensing data/ vegetation maps and monitored on the 3 years throughout the duration of the project	Manual methods using overlay maps, or GIS where feasible and fixed point photography; Biodiversity Monitoring System (BMS)	Can show expansion and retreat of habitats. Shows whether habitat is being gained or lost over the monitoring area.
Change in number and composition of species	Numbers, presence or absence. Sampling will be done twice a year during dry and wet season	Transect surveys, mist netting, harp trapping and using capture mark recapture method (bird-banding)	Indicates overall change in species population size composition per habitat type
Change in abundance and distribution of keystone/indicator/and other species of special interest	Numbers, presence or absence. Sampling will be done twice a year during dry and wet season	Transect surveys, mist netting, harp trapping	Can indicate changes in species range due to changes in environmental factors (ecological processes)

B3.2 Develop an initial plan for assessing the effectiveness of measures used to maintain or enhance High Conservation Values related to globally, regionally or nationally significant biodiversity (G1.8.1-3) present in the project zone.

Monitoring and assessment of threatened flora and fauna will be conducted annually to quantify and monitor the trend or number of threatened, endemic and globally threatened endemic species documented within the project zone. The same monitoring methods as described in B3.1 will be used for HCVs as well. The survey of flora will be conducted once a year while that of fauna will be conducted once in each of rainy and dry seasons. Threatened species of plants planted in reforestation area will be monitored following the quarterly assessment for survival count.

Three species of mammals and reptiles (*Sus philippensis*, *Cervus mariannus* and *Varanus olivaceus*) have been reported from the project zone through direct observations and key informant interviews. The project designated these species as the priority species for quarterly monitoring.

B3.3 Commit to developing a full monitoring plan within six months of the project start date or within twelve months of validation against the Standards and to disseminate this plan and the results of monitoring, ensuring that they are made publicly available on the internet and are communicated to the communities and other stakeholders.

A full monitoring plan has already been developed for the project. Initial surveys and assessments have already been conducted and reports have been drafted to be shared with project partners and other concerned stakeholders. A team composed of CIP (as lead), technical staff of DENR and some local residents will spearhead the implementation of the monitoring plan. Data collection for birds and mammals will be done twice a year—rainy season and dry season. Flora monitoring will only be once a year. The established three monitoring sites for fauna and six transect sites for flora will be repeatedly used for monitoring.

Gen	Clim	Comm	Bio	Gold
GL1. Optional				

GOLD LEVEL SECTION

GL1. Climate Change Adaptation Benefits

GL1.1 Identify likely regional climate change and climate variability scenarios and impacts, using available studies, and identify potential changes in the local land-use scenario due to these climate change scenarios in the absence of the project.

GL1.2 Identify any risks to the project's climate, community and biodiversity benefits resulting from likely climate change and climate variability impacts and explain how these risks will be mitigated.

GL1.3 Demonstrate that current or anticipated climate changes are having or are likely to have an impact on the well-being of communities *and/or* the conservation status of biodiversity in the project zone and surrounding regions.

GL1.4 Demonstrate that the project activities will assist communities *and/or* biodiversity to adapt to the probable impacts of climate change.

Gen	Clim	Comm	Bio	Gold
GL2. Optional				

GL2. Exceptional Community Benefits

GL2.1 Demonstrate that the project zone is in a low human development country OR in an administrative area of a medium or high human development country in which at least 50% of the population of that area is below the national poverty line.

GL2.2 Demonstrate that at least 50% of households within the lowest category of well-being (e.g., poorest quartile) of the community are likely to benefit substantially from the project.

GL2.3 Demonstrate that any barriers or risks that might prevent benefits going to poorer households have been identified and addressed in order to increase the probable flow of benefits to poorer households.

GL2.4 Demonstrate that measures have been taken to identify any poorer and more vulnerable households and individuals whose well-being or poverty may be negatively affected by the project, and that the project design includes measures to avoid any such impacts. Where negative impacts are unavoidable, demonstrate that they will be effectively mitigated.

GL2.5 Demonstrate that community impact monitoring will be able to identify positive and negative impacts on poorer and more vulnerable groups. The social impact monitoring must take a differentiated approach that can identify positive and negative impacts on poorer households and individuals and other disadvantaged groups, including women.

Gen	Clim	Comm	Bio	Gold
GL3. Optional				

GL3. Exceptional Biodiversity Benefits

GL3.1 Demonstrate the site's Vulnerability by providing evidence for regular occurrence of a globally threatened species (according to the IUCN Red List) at the site:

GL3.1.1 Critically Endangered (CR) and Endangered (EN) species - presence of at least a single individual; or

GL3.1.2 Vulnerable species (VU) - presence of at least 30 individuals or 10 pairs.

The Peñablanca Protected Landscape and Seascape, in which the project zone is located, has been identified as a key biodiversity area (KBA). This identification was based on the recorded occurrence of 1 CR species, 5 EN species, and 22 VU species of terrestrial fauna (according to 2006 IUCN Red List; CIP, DENR-PAWB and Haribon, 2006; see Appendix 12). According to the revised IUCN Red List of 2009, the PPLS has recorded occurrence of two CR species (Philippine Eagle, *Pithecophaga jefferyi*, and the Isabela Oriole, *Oriolus isabelae*), three EN species (Taylor's Igorot frog, *Platymantis taylori*; Golden-crowned fruit bat, *Acerodon jubatus*; and Cantor's soft-shelled turtle, *Pelochelys cantorii*), and 20 VU species of fauna (Appendix 12).

The nation-wide KBA analysis was based on terrestrial fauna only. The flora survey conducted by CIP in 2002 recorded 11 critically endangered plants, (i.e. *Hopea acuminta*, *Shorea guiso*, *S. polysprema*, *S. contorta*, *S. negrosensis*, *S. malibato*, *Dipterocarpus gracilis*, *D. validis*, *D. grandiflorus*, *D. kunstleri*, and *Parashorea malaanonan*) in this KBA.

Information specific to the project zone is also available to demonstrate the project zone's Vulnerability. Biodiversity surveys conducted by CIP within the project area recorded several species listed as vulnerable in the 2008 IUCN Red List of threatened species. This includes nine species of plants (*Afzelia rhomboidea*, *Aglaia cumingiana*, *Artocarpus blancoi*, *Artocarpus treculianus*, *Ficus ulmifolia*, *Macaranga grandifolia*, *Pterocarpus indicus*, *Sandoricum vidalii*, and *Vitex parviflora*). Considerable number of individuals of these threatened plant species can be found within the project zone. Five of the threatened endemic plant species are raised in the nursery and used for reforestation.

One species of reptile (*Varanus olivaceus*), two species of birds (*Anas luzonica* and *Bubo philippensis*) and two species of large mammals (*Sus philippensis* and *Cervus mariannus*) have also been recorded in the project zone. The transect survey for birds conducted during April – May 2009 recorded 98 individuals of *Anas luzonica* in the monitoring site 1 (Reforestation/Agroforestry area in Cabasan; see B3.1 for the map of the monitoring sites). In addition, during the conduct of Focus Group Discussion in September 2009 as part of the quarterly biodiversity monitoring, a total of 344 individuals of *Anas luzonica* were documented by the Community Monitoring Groups in the five barangays. On the other hand, *Bubo philippensis* was observed outside the transect site 2 (Enhancement planting area in San Roque).

Sus philippensis, *Cervus mariannus* and *Varanus olivaceus* were recorded through direct observation and key informant interviews with the locals and inputs from the Community Monitoring Group. During the Focus Group Discussion in September 2009, 41 individuals of *S.*

philippensis, four individuals of *C. mariannus* and eight individuals of *V. olivaceus* were recorded in the five barangays of the project area. The project designated these two threatened endemic large mammals and a reptile as the priority species for quarterly monitoring.

GL3.2 Demonstrate the site's Irreplaceability by providing evidence that the site satisfies one of the below criteria expressed as a minimum proportion of a species' global population present at the site at any stage of the species' lifecycle according to the following thresholds:

- GL3.2.1 Restricted-range species - species with a global range less than 50,000 km² and 5% of global population at the site; or
- GL3.2.2 Species with large but clumped distributions - 5% of the global population at the site; or
- GL3.2.3 Globally significant congregations - 1% of the global population seasonally at the site; or
- GL3.2.4 Globally significant source populations – responsible for maintaining 1% of the global population at the site

In the Philippines, due to lack of data on range and population size (both global and local), endemic species have been used as a proxy for restricted-range species (CIP, DENR-PAWB and Haribon, 2006).

Twenty endemic species has been recorded to occur within the PPLS KBA (CIP, DENR-PAWB and Haribon, 2006; see Appendix 12 for "RR"). At least 18 of these endemic species are forest-dependent. The estimated forest cover in the country is 71,684 km², but only 4% (2,560 km²) is closed-canopy forest (DENR-Forest Management: <http://forestry.denr.gov.ph/statglance.htm>). It seems highly possible that the global ranges of most of these species are smaller than 50,000 km². However, in the absence of population data for these species, we cannot determine if 5% of the global population for each species is present within the PPLS.

Fourteen out of 20 restricted range (RR) species listed for the PPLS are endemic to the island of Luzon, where around 13,000 km² of closed forest remains. The PPLS has 797.47 km² of forest remaining, which is about 6% of all the remaining forest in the island of Luzon. Although there is no population data for these 14 species, on the assumption of uniform distribution, it is highly possible that the PPLS, of which the project area is part, fulfills the Irreplaceability criterion on the basis of GL3.2.1.

From the surveys conducted within the project zone, there are 24 species of plants, 41 species of birds and eight species of mammals that are endemic to the country (Appendices 1, 2 and 3). Based on the opportunistic approach, additional three endemic species were recorded (*V. olivaceus*, *S. philippensis* and *C. mariannus*). Six of the endemic birds are restricted to the island of Luzon: *Phaenicophaeus cumingi*, *Phaenicophaeus superciliosus*, *Stachyris striatas*, *Cyornis herioti*, *Orthotomus derbianus* and *Zosterops meyeri*. The last two species are new additions to the list of species occurring within the PPLS.

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VII. Appendices

Appendix 1. Agroforestry MOA

MEMORANDUM OF AGREEMENT

KNOW ALL MEN BY THESE PRESENTS:

This agreement is made and entered into this ____th day of September 2008 by and among:

DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES through its Regional Office located at Regional Center, Carig, Tuguegarao City, Cagayan, represented herein by its Regional Executive Director, **CLARENCE L. BAGUILAT**, and hereinafter referred to as the “**DENR**”;

CONSERVATION INTERNATIONAL, a non-profit, public benefit corporation organized and existing under the laws of the State of California, USA (“hereinafter referred to as **CI**”), duly licensed by the Securities and Exchange Commission as a branch office in the Philippines, with business address at #6 Maalalahanin Street, Teachers Village, Diliman, Quezon City, Philippines, represented herein by its Executive Director, **ROMEO B. TRONO**, and hereinafter referred to as “**CIP**”;

and

Each **UPLAND FARMER**, as described on the attached list, each acting in an individual capacity, and not jointly and severally, and hereinafter referred to as “**UPLAND FARMER**”

WITNESSETH

WHEREAS, DENR, REGION 2, is the local office of the Department mandated to undertake the management and implementation of various programs and projects of the government to protect and conserve the Region’s natural resources;

WHEREAS, CIP, a non-profit international conservation organization with a noble mission to conserve the Earth’s living natural heritage, global biodiversity as well as to demonstrate that human societies are able to live harmoniously with nature, has entered into an agreement with the Toyota Motor Corporation to implement a reforestation project within the Penablanca Protected Landscape and Seascape (PPLS) in partnership with the Protected Area’s (PA) stakeholders;

WHEREAS, the UPLAND FARMER has occupied and presently cultivates a parcel of land within the PPLS prior to its proclamation as Protected Area by virtue of Presidential Proclamation;

WHEREAS, the Parties hereto recognize that the pursuit of sustainable development including biodiversity conservation and responsible socio-economic endeavors is as much a concern of the government as it is of the non-government organizations, the private sector and the concerned local communities;

WHEREAS, the government, through the DENR and the PAMB, promotes the active participation of the local communities and the private sector to protect and rehabilitate the degraded portion of the PPLS through reforestation, enrichment planting and agroforestry to enhance the biodiversity, maintain the ecosystems functions while at the same



time improving the living conditions of families living inside the PA and within the buffer zone of the protected area;

WHEREAS, the DENR, in collaboration with the PAMB, will issue the appropriate tenorial instrument to the individual upland farmers who will be assisted under this Project, and ascertain the boundary of their farm lot while ensuring that the benefits generated from the agro-forestry will accrue to them;

WHEREAS, Toyota Motor Corporation has committed to extend support and assistance through their Corporate Social Responsibility fund to reforest degraded portion of the PPLS including the implementation of other avoided deforestation mechanisms project to help mitigate climate change while at the same time improving the socio-economic condition of the local people;

WHEREAS, CIP and Toyota Motor Corporation have agreed to develop and institute a sustainability mechanism by establishing a "Reforestation Fund" under this Project through the agro-forestry component to generate funds to maintain the development and expansion of the reforestation area in other barangays to be taken from revenues generated from fruits of the fruit-bearing trees planted by upland farmers like; Mango, Cacao, etc. in their individual farm lots;

WHEREAS, the DENR Regional Executive Director as Protected Area Management Board (PAMB) chairperson was authorized by the Peñablanca Protected Landscape and Seascape PAMB to sign the agreement based on the PAMB Resolution No. ___ dated _____.

WHEREAS, the upland farmers during the series of consultations and meetings have agreed to support the establishment of a "Reforestation Fund" to sustain the management and development of the protected area;

NOW, THEREFORE, for and in consideration of the above premises and of the mutual covenants set forth hereunder, the Parties have agreed as follows:

1. OBJECTIVES:

The Parties hereby agree to cooperate and collaborate to implement the agro-forestry component including the development and establishment of a sustainability mechanism of the Project entitled "**Restoring the Forests of the Peñablanca Protected Landscape and Seascape for Watershed and Biodiversity Conservation and As Catalyst for Socio-Economic Development**", otherwise known as the "**Peñablanca Reforestation Project**" (and referred to herein as the "Project") in the PPLS, with the following objectives:

- 1.1 Restore the degraded portion of the PPLS through agro-forestry scheme by mobilizing upland farmers to plant fruit trees, cash crops, and to establish avoided deforestation mechanism projects to combat deforestation like the creation of firewood plantation, introduction of more efficient cooking gadgets, etc. in barangays San Roque, Sisim, Bugatay, Cabasan and Mangga.;
- 1.2 Provide technical and financial support to the upland farmers occupying approximately 700 hectares (560 hectares of which is for phase 1 and the balance is for phase 2) inside the PPLS to develop their individual farmlots by planting fruit trees and cash crops to augment their family income;



- 1.3 Provide the necessary awareness and capacity to the upland farmers by providing the required skills training to initiate the various activities in developing and maintaining the individual farms;
- 1.4 Promote the total participation of the community particularly the upland farmers who will be directly involved in the agro-forestry project in the development and establishment of the "Reforestation Fund" to sustain and expand the project in adjacent barangays; and
- 1.5 Provide support for monitoring and project implementation to assess project impacts on biodiversity and the socio-economic conditions of local communities.

2. RECOGNITION OF TENURE

The **UPLAND FARMER** shall be issued the appropriate tenurial instrument applicable to the protected area as determined by the DENR, REGION 2 on the area he/she is currently occupying after thorough assessment to ascertain the UPLAND FARMER's eligibility based on existing policies on protected areas. Consequently, the UPLAND FARMER shall have the right to enjoy the use of the land and the fruits of fruit trees planted and other products derived from cash crops produced in this parcel of land situated at _____, Peñablanca, Cagayan and more particularly described in the attached map marked as "Annex A" which forms part of this Memorandum of Agreement (MOA).

3. ROLES AND RESPONSIBILITIES OF THE PARTIES:

3.1 DENR REGION 2 SHALL:

- 3.1.1 Provide support and technical assistance in the assessment, survey and mapping of farm lots claimed by upland farmers within the 700 hectares designated agro-forestry area for the issuance of appropriate tenurial instrument to the individual upland occupants;
- 3.1.2 Facilitate the processing, approval and issuance of appropriate tenurial instrument to qualified upland farmers identified within the target agro-forestry area;
- 3.1.3 Provide technical assistance and support to the upland farmers through the Protected Area Superintendent Office in developing their respective farmlots into agro-forestry and firewood plantation;
- 3.1.4 Provide support in organizing the community into People's Organization, including assistance in farm planning, management and protection of the upland farms of qualified participants;

provided regularly to the PAMB-PPLS for review and monitoring to be integrated in the DENR progress report; and

- 3.1.6 Conduct regular monitoring in collaboration with the key players of the project to ensure that implementation will proceed smoothly as planned.

3.2 CIP SHALL:

- 3.2.1 In coordination with Toyota Motor Corporation (TMC) and in collaboration with the DENR and the MENR office of the municipality of Penablanca, spearhead the implementation of the agro-forestry component through the sub-grant agreement with Counterpart Savings and Credit Cooperative (CSCC) who will handle the day-to-day activities to develop the individual farm lots of qualified participants;
- 3.2.2 Spearhead, with CSCC and with the full support of the DENR and LGU, the community organizing activities that will eventually result to the formation of People's organization composed of the upland farmers within the five barangays covered by the Project;
- 3.2.3 Conduct, with CSCC and in collaboration with the DENR and the LGU, the desired technical as well as skills training needed by the farmers to develop their respective farmlots including other skills training needed to combat deforestation;
- 3.2.4 Initiate, with CSCC and support from TMC, market studies for products to be generated from the agro-forestry development under this Project;
- 3.2.5 Provide support to the DENR and other key stakeholders in the awareness raising campaign activities to generate full understanding of the project participants on the benefits derived from the Project and the reason for establishing a "Reforestation Fund" as the sustainability mechanism of the Project;
- 3.2.6 Facilitate, with CSCC and in collaboration with the DENR and LGU, the establishment and/or creation of a "Reforestation Fund" through a mechanism that will be acceptable to all parties concerned; and
- 3.2.7 Work with CSCC to ensure that the upland farmers who will be assisted to develop their upland farms by planting high value fruit trees such as Mango, Cacao and coffee will remit portion of their net income (10%) from Mango fruit trees to the reforestation fund which will form part as capital build up for sustaining the development and expansion of the project in adjacent barangays.

3.3 UPLAND FARMER SHALL:

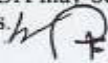
- 3.3.2 Develop the awarded farm lot based on the designed Agro-forestry Development and work plans with the technical and financial assistance directly from CSCC and CIP with support from DENR and LGU by planting fruit trees like Mango, Coffee, Cacao, etc., cash crops, and other tree species desired for firewood.
- 3.3.3 Provide the necessary labor inputs for the development of the farm lot into a sustainable agro-forestry farm, during planting, care and maintenance of planted seedlings, making efforts to achieve a survival rate of 80%
- 3.3.4 Apply sustainable farming practices and technologies in the development of the agro-forestry farm by using organic fertilizers, minimizing if not eliminating the use of chemicals and pesticides that will endanger the health of the community, as well as the local biodiversity.
- 3.3.5 Protect his/her farmplot including adjacent areas with natural forest vegetation from any illegal activities including collection of trees for charcoal, firewood or opening the area for slash and burn farming;
- 3.3.6 Attend and/or participate in all meetings, orientations, seminars trainings and other capacity building mechanisms to be conducted necessary to enhance the skills needed to develop the farmplot awarded;
- 3.3.7 Assist the DENR and PAMB and other stakeholders in the protection and management of PPLS particularly the project area covered by the reforestation project supported by TMC within the five barangays covered by this Project; and
- 3.3.8 Contribute regularly, at least 10% of the net income derived from the mango fruit trees supported under the project developed agro-forestry farm, to the Reforestation Fund to be established and/or created to sustain the development and expansion of the Project in adjacent barangays with the assistance of CIP, CSCC, and DENR

4. TRANSFERABILITY

In case of death or permanent disability/incapacity of the UPLAND FARMER, his rights and interests over the awarded area may be transferred only to his legal heirs in the order of succession as defined in the New Civil Code.

TERMINATION AND AMENDMENT OF THE MOA

This contract may be terminated based on the non-performance and/or violation by any of the Parties of any provision herein provided, or by mutual agreement of the Parties. Further, this MOA may be amended and/or supplemented with the conformity in writing of all the Parties.



MISCELLANEOUS PROVISIONS

1. This MOA is valid, binding, and enforceable in its entirety on and against each of the parties, and shall remain in effect until July 31, 2010. This MOA may be extended upon the written agreement of the parties.
2. This MOA may be terminated or suspended with thirty (30) days written notice to the other parties.
3. The failure or delay of the parties to insist in any or more instances upon a strict performance of any of the terms and conditions of this MOA, or to exercise any right or remedy herein contained, shall not be deemed a relinquishment or waiver of any rights or remedies the parties may have, nor shall it be construed as a condonation of any subsequent breach or default of the terms and conditions of this Agreement. No waiver by any party shall be effective unless the same is made in writing and signed by the party.
4. **Good Faith.** The parties hereto recognize that it is impossible to elaborate in advance all the operating details of this MOA. In discharging their respective duties and obligations hereunder, the parties shall apply the standards of good faith and commercial loyalty taking into consideration that the main purpose of this MOA is to insure utmost cooperation among the parties. The parties, at all times, shall exert their best efforts to safeguard the objectives of this MOA.
5. If any one or more of the provisions in this Agreement shall be invalid, illegal or unenforceable in any respect, the validity, legality and enforceability of the remaining provisions shall not in any way be affected or impaired.
6. This Agreement shall be governed by the applicable laws of the Republic of the Philippines. The parties shall, in all cases, endeavor to settle amicably any dispute which may arise between them out of or in connection with this Agreement. In case of failure to reach an amicable settlement between the parties, any and all judicial actions arising out of or in connection with this Agreement shall be brought before the proper courts of Quezon City, Metro Manila, to the exclusion of all other quasi-judicial agency and courts.
7. Funds and resources shall not be expended for payments that are, or give the appearance of, a conflict of interest. A conflict of interest is defined as a transaction in which an employee's personal or financial interests conflict or appear to conflict with his official responsibility. Examples include, but are not limited to, such transactions as payments to the business partner(s) of the project director, co-project director, or members of their immediate families for salaries, expense reimbursement, or any other type of compensation, or payments to organizations in which the project director, co-project director, or member(s) of their immediate families have a financial interest.
8. No assistance, payments, or anything of value (monetary or non-monetary), shall be made, promised, offered to or accepted by any government employee or official (1) in contravention of any U.S. or other applicable law (including, but not limited to, the U.S. Foreign Corrupt Practices Act) or regulation; (2) without the express consent of the government for which the employee or official works; and (3) that is not reasonable, bona fide, and directly related to the activities funded under this MOA. All parties hereby certify that no payments or other form of assistance shall be accepted by or made to any government employee or official, including grantee, (a) to influence any official government act or decision, (b) to induce any government employee or official to do or omit to do any act in violation of his or her lawful duty, or (c) to obtain or retain business for, or direct business to any individual or entity. If grantee is a government official or employee, grantee shall recuse himself or herself from any governmental act or decision affecting CI or CIP, and shall not influence any governmental act or decision affecting CI or CIP. Under no circumstances shall any payments or anything of value be made,

9. PROJECT MONITORING

- a. RECORD KEEPING. Parties shall keep all pertinent records, both financial and technical, relating to this document for a period of three years following the termination or expiration. CI, its representatives, and assignees reserve the right to inspect, review or audit any and all related records.
- b. SITE VISITS. CI regards monitoring of project activities as essential to effective grant making. CI, its representatives and assignees, may make site visits to review project progress and results. To the extent possible, CI shall advise of any such visit in advance.
- c. AUDIT. CI reserves the right to require a project or organizational audit of expenses incurred under this MOA. All parties agree to reimburse CI, at their sole expense, the amount of any expenditures disallowed by auditors, through an audit exception or other appropriate means, based upon a finding that such expenditures failed to comply with a provision of this MOA.

10. LOCAL LAW. All parties agree to obey all local laws, including those enforcing social, labor and tax policies.

11. ANTI-TERRORISM REPRESENTATION AND WARRANTY. U.S. Executive Orders and U.S. law prohibit transactions with, and the provision of resources and support to, individuals and organizations associated with terrorism. All parties represent and warrant that they comply with all applicable provisions of such U.S. Executive Orders and U.S. law

12. LOGOS. No party shall make any use of the logo or the name of CI, CIP, or any other party, except as expressly authorized in writing.

13. INDEMNIFICATION. To the extent permitted by law, the parties agree to indemnify CI and CIP, and its officers and directors, including the cost of defense, for any claim made against them arising out of Grantee's performance under this Grant.

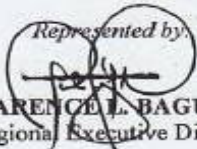
14. NO LIABILITY. Neither CI nor CIP shall be liable for losses, damages, claims, or other liabilities arising out of activities under this MOA. It is expressly understood that CI and CIP have no obligation to provide other or additional support of any kind.

15. RELATIONSHIP OF THE PARTIES. Nothing in this MOA shall be construed to create a relationship between the parties of agency, partnership, or joint ventures, nor to render any party liable for any debts or obligations incurred by the others. No party is authorized to make representations on behalf of the others, or to bind the others in any manner whatsoever.

(P) ✓

IN WITNESS WHEREOF, the Parties hereto have set their signatures this _____ day
of JUL 22 2009, 2009 in QUEZON CITY, Philippines

DEPARTMENT OF ENVIRONMENT AND NATURAL RSOURCES

Represented by:


CLARENCE L. BAGUILAT
Regional Executive Director

CONSERVATION INTERNATIONAL PHILIPPINES

Represented by:


ROMEO B. TRONO
Executive Director

Signed in the presence of:

ACKNOWLEDGMENT

REPUBLIC OF THE PHILIPPINES)
QUEZON CITY) S.S.

BEFORE ME, a Notary Public for and in QUEZON CITY this _____ day of
JUL 22 2009, personally appeared the following:

Name	(Any Government-issued I.D.)	Date/Place of Issuance
------	------------------------------	------------------------

known to me to be the same persons who executed the foregoing Memorandum of Agreement and who acknowledged to me that the same is their free and voluntary act and deed, as well as the free and voluntary act and deed of the entities/institutions/agencies represented.

WITNESS MY HAND AND NOTARIAL SEAL on the date and at the place first above written.

NOTARY PUBLIC

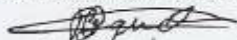

ATTY. BENJAMIN D. SALES
Notary Public-UM/10 Dec. 2010
PTR # 1119007/105103
MCLE Compliance No. 11-8014961

Doc No. 11
Page No. 3
Book No. VIII
Case of 2009


UPLAND FARMER

[BERNARDO AGUDO] of legal age, Filipino citizen, and whose family resides in Barangay [BLEATAY], Peñablanca, Cagayan, who is currently cultivating hectare/s within the Toyota Reforestation project and hereinafter referred to as the "UPLAND FARMER".

I hereby agree to the terms and conditions.


Bernardo Agudo


Appendix 2. DENR Commitment Letter



Republic of the Philippines
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
Region II, Cagayan Valley
Cariig, Tuguegarao City, 3500
Tel. Nos. (078) 844-1141 * 846-9129 (Fax) * e-mail :
"mailto:denr02ored@hotmail.com.ph" denr02ored@denr.gov.ph

December 2, 2009

Forester JUAN R. ACAY, JR.
Forestry and Carbon Manager
Conservation International, Philippines
Door 3, De Peralta Bldg., Andrews Subdivision
Bagay Road, Caritan Centro
Tuguegarao City



Sir:

In response to your letter of December 1, 2009 and as a party/partner to the memorandum of understanding in the implementation of the "Peñablanca Reforestation Project", we would assure you that the DENR particularly its Regional Office and the PENRO and CENRO of Tuguegarao, Cagayan shall extend the necessary technical assistance and support for the project.

To support the sustainable development of the project, the DENR further commits to facilitate the approval/renewal of long term agreements such as the CSCs and similar tenure instrument to participants/beneficiaries under the agroforestry component of the project consistent with the mandate of the agency enshrined under Executive Order 263 and the objectives of the Upland Development Program.

On the issue on who is the legitimate carbon owner, DAO 2004 – 32, the revised Guidelines on the established and management of Community Based Program on protected areas, the Community-Based Resource Management Agreement (PACBRMA) provides in the Privileges of the PACBRMA Holder in item 1.6 quoted "Receive all or portion of income and proceeds from the sustainable utilization of resources within the area". Further in the other condition specifically Item 3.1 states that "The DENR shall give exclusive rights to the PACBRMA Holder in obtaining the permit to extract, utilize and dispose any allowed non-timber forest products such as but not limited to rattan, bamboo, vine, fruit and tannin, and timber from trees planted by the holders themselves that are found within the PACBRMA area, other than those covered by the CRMP, subject to prior rights and existing laws, rules and regulations. Provided that no cutting of naturally grown trees shall be allowed".

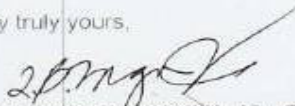
Likewise in the Certificate of Stewardship Contract Under B. Right of the GRANTEE stipulates that:

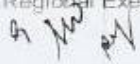
1. The Grantee shall have the right to peacefully possess and cultivate the land and enjoy the fruits thereof, the right to manage and work on the land in accordance with appropriate farm method and practices such another right as may be granted by law.
2. All income/proceeds derived from the land shall accrue to the GRANTEE.

Considering the above stipulations, it is clearly stated that the owner of the planted trees are the tenure holders.

We look forward to our continuous and harmonious partnership.

Very truly yours,


LAUREANO B. LINGAN, JR., CESO IV
Regional Executive Director



Appendix 3. List of plants observed within the project area.

Family/Scientific Name		Common Name	Remarks
Family Acanthaceae			
1	<i>Hemigraphis sp.</i>		
Family Amaranthaceae			
2	<i>Amaranthus gracilis Desf.</i>		Introduced-naturalized
3	<i>Cyathula prostrata Blume</i>		Indigenous/Non-endemic
Family Anacardiaceae			
4	<i>Buchanania arborescens (Blume) Blume</i>		Indigenous/Non-endemic
5	<i>Mangifera indica L.</i>		Introduced-naturalized
6	<i>Semecarpus cuneiformis Blanco</i>	Ligas	Indigenous/Non-endemic
Family Annonaceae			
7	<i>Annona sp.</i>		Introduced
8	<i>Genus Indet</i>		
9	<i>Mitrephora reflexa Merr.</i>		Endemic
10	<i>Mitrephora sp.</i>		
Family Apocynaceae			
11	<i>Alstonia macrophylla Wall.</i>	Batino	Indigenous/Non-endemic
12	<i>Alstonia scholaris (L.) R Br</i>		Indigenous/Non-endemic
13	<i>Amphineurion marginatum (Roxb.) DJ Middleton</i>		Indigenous/Non-endemic
14	<i>Ochrosia ackeringae (Teysm. & Binn.) Miq.</i>		Indigenous/Non-endemic
15	<i>Tabernaemontana pandacaqui Poir.</i>	Pandakaki	Indigenous/Non-endemic
16	<i>Tylophora sp.</i>		
Family Araceae			
17	<i>Alocasia sp.</i>		
18	<i>Amorphophallus sp.</i>		
19	<i>Epipremnum pinnatum (L.) Engl.</i>		Indigenous/Non-endemic
Family Araliaceae			
20	<i>Polyscias nodosa (Blume) Seem.</i>	Malapapaya	Indigenous/Non-endemic
Family Aristolochiaceae			
21	<i>Aristolochia sp.</i>		
22	<i>Aristolochia tagala Cham.</i>		Indigenous/Non-endemic
Family Asclepiadaceae			
23	<i>Asclepias curassavica L.</i>		
24	<i>Dischidia sp.</i>		
25	<i>Genus Indet</i>		
26	<i>Streptocaulon baumii Decne.</i>		Endemic
27	<i>Streptocaulon cumingii (Turcz.) Fern.-Villar</i>		Endemic
28	<i>Telosma sp.</i>		
Family Bignoniaceae			
29	<i>Radermachera grandiflora</i>		Indigenous/Non-endemic
Family Bombacaceae			
30	<i>Ceiba pentandra</i>		
Family Boraginaceae			
31	<i>Coldenia procumbens L.</i>		Indigenous/Non-endemic
32	<i>Heliotropium indicum L.</i>		Introduced-naturalized
33	<i>Trichodesma zeylanicum (Burm.f.) R Br.</i>		
Family Burseraceae			

	Family/Scientific Name	Common Name	Remarks
34	<i>Canarium asperum</i> Benth.	Pagsahingin	Indigenous/Non-endemic
Family Capparidaceae			
35	<i>Capparis</i> sp.		
Family Caricaceae			
36	<i>Carica papaya</i> L.		Introduced-naturalized
Family Celastraceae			
37	<i>Celastrus</i> sp.		
38	<i>Glyptopetalum</i> sp.		
39	<i>Gymnosporia spinosa</i> (Blanco) Merr. & Rolfe		Endemic
40	<i>Salacia</i> sp.		
Family Combretaceae			
41	<i>Combretum</i> sp.		
42	<i>Terminalia microcarpa</i> Decne		Indigenous/Non-endemic
43	<i>Terminalia</i> sp.		
Family Compositae			
44	<i>Ageratum conyzoides</i> L.		Introduced-naturalized
45	<i>Blumea balsamifera</i> (L.) DC		Indigenous/Non-endemic
46	<i>Blumea hieraciifolia</i> (Don) DC		Indigenous/Non-endemic
47	<i>Blumea laciniata</i> (Roxb.) DC		Indigenous/Non-endemic
48	<i>Blumea</i> sp.		
49	<i>Blumea mollis</i> (D Don) Merr.		Indigenous/Non-endemic
50	<i>Chromolaena odorata</i> (L.) R King & H Robinson		Introduced-naturalized
51	<i>Conyza sumatrensis</i> (Retz.) Walker		
52	<i>Crassocephalum crepidioides</i> (Benth.) S Moore		Introduced-naturalized
53	<i>Cyanthillium cinereum</i> (L.) H Robinson		Introduced-naturalized
54	<i>Elephantopus scaber</i> L.		Introduced-naturalized
55	<i>Emilia sonchifolia</i> (L.) DC		Indigenous/Non-endemic
56	<i>Glossocardia bidens</i> (Retz.) Veldk.		Indigenous/Non-endemic
57	<i>Lactuca laevigata</i> (Blume) DC		Indigenous/Non-endemic
58	<i>Mikania cordata</i> (Burm.) BL Robinson		Introduced-naturalized
59	<i>Pseudelephantopus spicatus</i> (Juss.) Rohr		Introduced-naturalized
60	<i>Sonchus oleraceus</i> L.		Introduced-naturalized
61	<i>Tridax procumbens</i> L.		Introduced-naturalized
Family Connaraceae			
62	<i>Rourea minor</i> (Gaertn.) Alston		Indigenous/Non-endemic
Family Convolvulaceae			
63	<i>Evolvulus alsinoides</i> L.		Indigenous/Non-endemic
64	<i>Ipomoea</i> sp.		
65	<i>Merremia</i> sp.		
Family Cucurbitaceae			
66	<i>Momordica charantia</i> L.		Introduced-naturalized
67	<i>Trichosanthes</i> sp.		
Family Cyperaceae			
68	<i>Cyperus cyperoides</i> (L.) Kuntze		Indigenous/Non-endemic
69	<i>Cyperus difformis</i> L.		Indigenous/Non-endemic
70	<i>Fimbristylis schoenoides</i> (Retz.) Vahl		Indigenous/Non-endemic
71	<i>Fimbristylis</i> sp.		

	Family/Scientific Name	Common Name	Remarks
72	<i>Fimbristylis sp. 1</i>		
73	<i>Fimbristylis supinus'</i>		
Family Dennstaedtiaceae			
74	<i>Microlepia sp.</i>		
Family Dioscoreaceae			
75	<i>Dioscorea sp.</i>		
Family Ebenaceae			
76	<i>Diospyros pilosanthera Blanco</i>	Bolong-eta	Widespread/EN*
77	<i>Diospyros sp.</i>		
Family Euphorbiaceae			
78	<i>Acalypha caturus Blume</i>	Migtanong-puso	Indigenous/Non-endemic
79	<i>Antidesma ghaesembilla Gaertn.</i>	Binayoyo	Indigenous/Non-endemic
80	<i>Breynia sp.</i>		
81	<i>Bridelia sp.</i>		
82	<i>Chamaesyce hirta (L.) Millsp.</i>		Indigenous/Non-endemic
83	<i>Chamaesyce vachellii (Hook. & Arn.) Hara</i>		Indigenous/Non-endemic
84	<i>Endospermum peltatum Merr.</i>		Indigenous/Non-endemic
85	<i>Glochidion luzonense Elmer</i>	Apaped	Indigenous/Non-endemic
86	<i>Glochidion phyllanthoides Merr.</i>	Malabagna	Endemic
87	<i>Glochidion sp.</i>		
88	<i>Glochidion urophylloides Elmer</i>	Halakan	Endemic
89	<i>Jatropha curcas L.</i>		Introduced-naturalized
90	<i>Macaranga grandifolia (Blanco) Merr.</i>	Takip-asin	Endemic/VU^
91	<i>Macaranga tanarius</i>	Binunga	Indigenous/Non-endemic
92	<i>Mallotus philippensis</i>	Banato	Indigenous/Non-endemic
93	<i>Manihot esculenta Crantz</i>		
94	<i>Melanoplepis multiglandulosus</i>	Alim	Indigenous/Non-endemic
95	<i>Phyllanthus amarus Schumach. & Thonn</i>		
96	<i>Phyllanthus virgatus G Forst.</i>		Indigenous/Non-endemic
97	<i>Securinega virosa (syn. Flueggea virosa)</i>		Indigenous/Non-endemic
Family Flacourtiaceae			
98	<i>Casearia grewiaefolia Vent.</i>	Kaluag	Indigenous/Non-endemic
99	<i>Casearia sp.</i>		
100	<i>Homalium sp.</i>		
101	<i>Flacourtia rukam</i>	Aninguai	Indigenous/Non-endemic
Family Graminae			
102	<i>Alloteropsis semialata (R Br.) Hitchc.</i>		Indigenous/Non-endemic
103	<i>Axonopus compressus (Sw.) P Beauv.</i>		Widespread/Introduced-naturalized
104	<i>Bothriochloa sp.</i>		
105	<i>Chrysopogon aciculatus (Retz.) Trin.</i>		Indigenous/Non-endemic
106	<i>Cyrtococcum patens (L.) Camus</i>		Indigenous/Non-endemic
107	<i>Dichanthium sp.</i>		
108	<i>Digitaria sp.</i>		
109	<i>Digitaria violascens Link</i>		Indigenous/Non-endemic
110	<i>Echinochloa colona (L.) Link</i>		Indigenous/Non-endemic
111	<i>Eulalia sp.</i>		
112	<i>Imperata cylindrica (L.) P. Beauv</i>		Indigenous/Non-endemic

	Family/Scientific Name	Common Name	Remarks
113	<i>Isachne sp.</i>		
114	<i>Ischaemum sp.</i>		
115	<i>Melinis repens</i> (Willd.) Zizka		Introduced-naturalized
116	<i>Mnesithea granularis</i> (L.) Koning & Sosef		Indigenous/Non-endemic
117	<i>Mnesithea laevis</i> (Retz.) Kunth		Indigenous/Non-endemic
118	<i>Mnesithea rottboellioides</i> (R Br.) Koning & Sosef		Indigenous/Non-endemic
119	<i>Ophiuros sp.</i>		
120	<i>Oplismenus compositus</i> (L.) P. Beauv.		Indigenous/Non-endemic
121	<i>Paspalum scrobiculatum</i> L.		Indigenous/Non-endemic
122	<i>Paspalum sp.</i>		
123	<i>Pennisetum sp.</i>		
124	<i>Saccharum spontaneum</i> L.		Indigenous/Non-endemic
125	<i>Schizachyrium sp.</i>		
126	<i>Setaria parviflora</i> (Poir.) Kerguelen		Indigenous/Non-endemic
127	<i>Sorghum nitidum</i> (Vahl) Pers.		Indigenous/Non-endemic
128	<i>Themeda gigantea</i> (Cav.) Hackel		Indigenous/Non-endemic
129	<i>Themeda triandra</i> Forssk.		Indigenous/Non-endemic
130	<i>Urochloa sp.</i>		
Family Guttiferae			
131	<i>Garcinia sp.</i>		
Family Hernandiaceae			
132	<i>Illigera sp.</i>		
Family Hypericaceae			
133	<i>Cratoxylum cochinchinense</i> (Lour.) Blume		Indigenous/Non-endemic
134	<i>Cratoxylum sumatranum</i> (Jack) Blume	Paguringon	Indigenous/Non-endemic
Family Labiatae			
135	<i>Anisomeles indica</i> (L.) Kuntze		Indigenous/Non-endemic
136	Genus Indet		
137	<i>Hyptis capitata</i> Jacq.		Indigenous/Non-endemic
138	<i>Hyptis suaveolens</i> (L.) Poit.		Indigenous/Non-endemic
139	<i>Leucas decedentata</i> (Willd.) J. Sm.		Indigenous/Non-endemic
140	<i>Leucas sp.</i>		
141	<i>Pogostemon velatus</i> Benth.		Indigenous/Non-endemic
Family Lauraceae			
142	<i>Litsea glutinosa</i> (Lour.) C Robinson	Sablot	Indigenous/Non-endemic
Family Leeaceae			
143	<i>Leea aculeata</i> Blume ex Spreng.	Amamali	Indigenous/Non-endemic
144	<i>Leea guineensis</i> G Don	Mali-mali	Indigenous/Non-endemic
Family Leguminosae			
145	<i>Abrus precatorius</i> L.	Kansasaga	Indigenous/Non-endemic
146	<i>Azelia rhomboidea</i> (Blanco) Vidal		Indigenous/Non-endemic/EN*VU^
147	<i>Albizia procera</i> (Roxb.) Benth.	Akleng-parang	Indigenous/Non-endemic
148	<i>Albizia saponaria</i> (Lour.) Blume ex Miq.	Bahai	Indigenous/Non-endemic
149	<i>Alysicarpus sp.</i>		Indigenous/Non-endemic
150	<i>Archidendron scutiferum</i> (Blanco) Nielsen	Anagap	Indigenous/Non-endemic
151	<i>Archidendron sp.</i>		
152	<i>Atylosia mollis</i> (Willd.) Gaertn.		Indigenous/Non-endemic

	Family/Scientific Name	Common Name	Remarks
153	<i>Bauhinia sp.</i>		
154	<i>Caesalpinia latisiliqua (Cav.) Hattink</i>		Indigenous/Non-endemic
155	<i>Canavalia sp.</i>		Indigenous/Non-endemic
156	<i>Cassia sp.</i>		
157	<i>Centrosema pubescens Benth.</i>		Introduced-naturalized
158	<i>Crotalaria calycina Schrank</i>		Indigenous/Non-endemic
159	<i>Crotalaria albida Heyne ex Roth</i>		Indigenous/Non-endemic
160	<i>Crotalaria mucronata Desv.</i>		Introduced-naturalized
161	<i>Crotalaria sp.</i>		
162	<i>Dalbergia sp.</i>		
163	<i>Desmodium procumbens L.</i>		Introduced-naturalized
164	<i>Desmodium sp.</i>		
165	<i>Desmodium triflorum (L.) DC</i>		Indigenous/Non-endemic
166	<i>Dunbaria sp.</i>		
167	<i>Erythrina variegata (syn. E. orientalis)</i>	Dapdap	Indigenous/Non-endemic
168	<i>Gliricidia sepium (Jacq.) Walp.</i>		Introduced-naturalized
169	<i>Leucaena leucocephala (Lam.) de Wit</i>		Introduced-naturalized
170	<i>Mimosa diplotricha C. Wight ex Sauvalle</i>		Introduced-naturalized
171	<i>Mimosa pudica L.</i>		Introduced-naturalized
172	<i>Moghania macrophylla Wall. macrophylla Wall.</i>		Indigenous/Non-endemic
173	<i>Moghania strobilifera (L.) Kuntze</i>		Indigenous/Non-endemic
174	<i>Phyllodium pulchellum (L.) Benth</i>		Indigenous/Non-endemic
175	<i>Pithecellobium dulce (Roxb.) Benth.</i>		Introduced-naturalized
176	<i>Pterocarpus indicus Willd</i>		Indigenous/Non/CR*VU^
177	<i>Pueraria sp.</i>		
178	<i>Samanea saman (Jacq.) Merr.</i>		Introduced-naturalized
179	<i>Tamarindus indica L.</i>		Introduced-naturalized
180	<i>Tephrosia sp.</i>		
181	<i>Uraria sp.</i>		
182	<i>Vigna unguiculata (L.) Walp</i>		Indigenous/Non-endemic
Family Loganiaceae			
183	<i>Buddleia asiatica Lour.</i>	Talikhono	Indigenous/Non-endemic
Family Loranthaceae			
184	<i>Dendrophthoe mearsii</i>		Indigenous/Non-endemic
185	<i>Taxillus chinensis (DC) Danser</i>		Indigenous/Non-endemic
Family Lythraceae			
186	<i>Ammania baccifera L.</i>		Indigenous/Non-endemic
187	<i>Lagerstroemia speciosa (L.) Pers.</i>	Banaba	Indigenous/Non-endemic
Family Malvaceae			
188	<i>Sida mysorensis Wight & Arn.</i>		Indigenous/Non-endemic
189	<i>Sida rhombifolia L.</i>		Indigenous/Non-endemic
190	<i>Urena lobata L.</i>		Indigenous/Non-endemic
Family Marantaceae			
191	<i>Donax cannaeformis (G Forst.) K Schum.</i>		Indigenous/Non-endemic
Family Melastomataceae			
192	<i>Melastoma malabathricum L.</i>	Malatungau	Indigenous/Non-endemic
193	<i>Memecylon sp.</i>		

	Family/Scientific Name	Common Name	Remarks
194	<i>Osbeckia chinensis</i> L.		Indigenous/Non-endemic
Family Meliaceae			
195	<i>Aglaiia cumingiana</i> Turcz.	Alauhau	Indigenous/Non-endemic/VU*^
196	<i>Aglaiia</i> sp.		
197	<i>Aphanamixis polystachya</i> (Wall.) RN Parker	Kangko	Indigenous/Non-endemic/VU*
198	<i>Cipadessa baccifera</i> (Roth) Miq.	Bieum	Indigenous/Non-endemic
199	<i>Dysoxylum gaudichaudianum</i> (A. Juss.) Miq.	Igyo	Indigenous/Non-endemic
200	<i>Sandoricum vidalii</i>	Wild Santol	Endemic/VU^
Family Menispermaceae			
201	<i>Genus Indet</i>		
Family Moraceae			
202	<i>Artocarpus blancoi</i> (Elmer) Merr.	Antipolo	Endemic/VU^
203	<i>Artocarpus ovatus</i> Blanco	Kubi	Endemic
204	<i>Artocarpus</i> sp.		
205	<i>Artocarpus treculianus</i> Elmer	Pakak	Endemic/VU*^
206	<i>Broussonetia luzonica</i> (Blanco) Bureau	Himbaba-o	Endemic
207	<i>Ficus magnoliifolia</i> Blume	Kanapai	Indigenous/Non-endemic
208	<i>Ficus minahassae</i> Teijsm. & Binn.	Hagimit	Indigenous/Non-endemic
209	<i>Ficus nota</i> (Blanco) Merr.	Tibig	Indigenous/Non-endemic
210	<i>Ficus pseudopalma</i> Blanco	Niog-niogan	Endemic
211	<i>Ficus septica</i> Burm.f.	Hauili	Indigenous/Non-endemic
212	<i>Ficus</i> sp.		
213	<i>Ficus ulmifolia</i> Lam.	Is-is	Endemic/VU^
214	<i>Ficus variegata</i> Blume	Tangisang-bayawak	Indigenous/Non-endemic
215	<i>Maclura cochinchinensis</i> (Lour.) Corner		Indigenous/Non-endemic
216	<i>Malaisia scandens</i> (Lour.) Planch.		Indigenous/Non-endemic
217	<i>Streblus asper</i> Lour.	Kalios	Indigenous/Non-endemic
218	<i>Streblus ilicifolius</i> (Vidal) Corner	Kuyos-kuyos	Indigenous/Non-endemic
Family Musaceae			
219	<i>Musa</i> sp.		
Family Myrsinaceae			
220	<i>Ardisia pyramidalis</i> (Cav.) Pers.	Aunasin	Indigenous/Non-endemic
221	<i>Embelia</i> sp.		
Family Myrtaceae			
222	<i>Psidium guajava</i> L.		Introduced-naturalized
223	<i>Syzygium</i> sp.		Widespread
224	<i>Syzygium calubcob</i> (C Robinson) Merr.		
Family Olacaceae			
225	<i>Olax imbricata</i> Roxb.		Indigenous/Non-endemic
Family Oleaceae			
226	<i>Chionanthus ramiflorus</i> Roxb.	Karaksan	Indigenous/Non-endemic
Family Onagraceae			
227	<i>Ludwigia hyssopifolia</i> (G Don) Exell		Indigenous/Non-endemic
228	<i>Ludwigia</i> sp.		Indigenous/Non-endemic
Family Orchidaceae			
229	<i>Corymborkis veratrifolia</i> (Reinw.) Blume		Endemic
230	<i>Genus Indet</i>		

	Family/Scientific Name	Common Name	Remarks
231	<i>Geodorum densiflorum</i> (Lam.) Schltr.		Indigenous/Non-endemic
Family Oxalidaceae			
232	<i>Averrhoa bilimbi</i> L.		Introduced-naturalized
Family Palmae			
233	<i>Caryota rumphiana</i>	Pugahan	Indigenous/Non-endemic
Family Pandanaceae			
234	<i>Freycinetia</i> sp.		
Family Passifloraceae			
235	<i>Adenia heterophylla</i> (Blume) Koord.		Indigenous/Non-endemic
236	<i>Passiflora foetida</i> L.		Introduced-naturalized
237	<i>Passiflora</i> cf. <i>philippinensis</i>		
238	<i>Trichosanthes</i> sp.		
Family Piperaceae			
239	<i>Peperomia pellucida</i> (L.) Humb., Bonpl. & Kunth		Introduced-naturalized
240	<i>Piper</i> sp.		
Family Pittosporaceae			
241	<i>Pittosporum pentandrum</i> (Blanco) Merr.	Mamalis	Indigenous/Non-endemic
Family Polypodiaceae			
242	<i>Drynaria rigidula</i> (Sw.) Bedd.		Indigenous/Non-endemic
243	<i>Drynaria</i> sp.		Indigenous/Non-endemic
Family Pteridaceae			
244	<i>Pteris ensiformis</i> Burm.		Indigenous/Non-endemic
245	<i>Pteris</i> sp.		
246	<i>Pteris vittata</i> L.		Indigenous/Non-endemic
247	<i>Pityrogramma calomelanos</i> (L.) Link		
Family Putranjivaceae			
248	<i>Drypetes longifolia</i> (Blume) Pax & Hoffm.	Balibkikan	Indigenous/Non-endemic
249	<i>Drypetes</i> sp.	Bato-bato	Widespread
Family Ranunculaceae			
250	<i>Naravelia</i> sp.		Indigenous/Non-endemic
Family Rhamnaceae			
251	<i>Gouania</i> sp.		Indigenous/Non-endemic
252	<i>Smythea</i> sp.		Indigenous/Non-endemic
253	<i>Zizyphus</i> sp.		
Family Rhizophoraceae			
254	<i>Carallia brachiata</i> (Lour.) Merr.	Bakawan-gubat	Indigenous/Non-endemic
Family Rosaceae			
255	<i>Prunus arborea</i>		Indigenous/Non-endemic
256	<i>Prunus marsupialis</i> Kalkm.	Amugan	Endemic
Family Rubiaceae			
257	<i>Canthium monstrosum</i> (A Rich.) Merr.	Tadiang-nunang	Endemic
258	<i>Canthium</i> sp.		
259	<i>Coffea</i> sp.		Introduced-naturalized
260	<i>Ixora</i> sp.		
261	<i>Knoxia sumatrensis</i> (Retz.) DC		Indigenous/Non-endemic
262	<i>Morinda citrifolia</i> L.		Indigenous/Non-endemic
263	<i>Nauclea orientalis</i> (L.) L.	Bangkal	Indigenous/Non-endemic

	Family/Scientific Name	Common Name	Remarks
264	<i>Neolamarckia cadamba</i> (Roxb.) Bosser		Introduced-naturalized
265	<i>Neonauclea reticulata</i> (Havil.) Merr.	Malauisak	Indigenous/Non-endemic
266	<i>Neonauclea</i> sp.		
267	<i>Oldenlandia corymbosa</i> L.		Indigenous/Non-endemic
268	<i>Paederia foetida</i> L.		Indigenous/Non-endemic
269	<i>Pavetta indica</i>		Indigenous/Non-endemic
270	<i>Psychotria gitingensis</i> Elmer		Endemic
271	<i>Psychotria luzoniensis</i>	Katakpo	Endemic
272	<i>Psychotria</i> sp.		
273	<i>Spermacoce hispida</i> L.		Indigenous/Non-endemic
274	<i>Spermacoce ocymoides</i> Burm.f.		Indigenous/Non-endemic
275	<i>Tarenna cumingiana</i>		Endemic
276	<i>Wendlandia luzoniensis</i> var. <i>membranifolia</i>		Endemic
Family Rutaceae			
277	<i>Citrus</i> sp.		
278	<i>Citrus</i> cf. <i>hystrix</i> DC		
279	<i>Clausena</i> sp.		
280	<i>Lunasia amara</i> Blanco	Lunas	Indigenous/Non-endemic
281	<i>Melicope confusa</i> (Merr.) Liu		Indigenous/Non-endemic
282	<i>Melicope</i> sp.		
283	<i>Melicope triphylla</i> (Lam.) Merr.		Endemic
284	<i>Micromelum compressum</i> (Blanco) Merr.	Tulibas-mabolo	Endemic
285	<i>Micromelum</i> sp.		
286	<i>Toddalia asiatica</i> (L.) Lam.	Bugkau	Indigenous/Non-endemic
Family Sapindaceae			
287	<i>Alectryon glaber</i> (Blume) Radlk.	Ibu	Indigenous/Non-endemic
288	<i>Cardiospermum halicacabum</i> L.		Indigenous/Non-endemic
289	<i>Guioa koelreuteria</i> (Blanco) Merr.	Alahan	Indigenous/Non-endemic
290	<i>Guioa pleuropteris</i> (Blume) Radlk.		Indigenous/Non-endemic
291	<i>Guioa</i> sp.		
292	<i>Harpullia arborea</i> (Blanco) Radlk.	Uas	Indigenous/Non-endemic
293	<i>Lepisanthes</i> sp.		
294	<i>Lepisanthes tetraphylla</i> (Vahl) Radlk.	Sarakag	Indigenous/Non-endemic
295	<i>Nephelium lappaceum</i> L.		
296	<i>Tristira</i> sp.		
Family Sapotaceae			
297	<i>Chrysophyllum cainito</i> L.		Introduced-naturalized
Family Schizaeaceae			
298	<i>Lygodium circinnatum</i> (Burm.) Sw.		Indigenous/Non-endemic
299	<i>Lygodium japonicum</i> (Thunb.) Sw.		Indigenous/Non-endemic
Family Scrophulariaceae			
300	<i>Centranthera cochinchinensis</i> (Lour.) Merr.		
301	<i>Lindernia</i> sp.		
302	<i>Striga asiatica</i> (L.) Kuntze		Indigenous/Non-endemic
Family Solanaceae			
303	<i>Solanum</i> sp.		
304	<i>Solanum torvum</i> Sw.		Indigenous/Non-endemic

Family/Scientific Name		Common Name	Remarks
Family Staphyleaceae			
305	<i>Bischofia javanica</i> Blume		Indigenous/Non-endemic
Family Sterculiaceae			
306	<i>Helicteres angustifolia</i> L.		Indigenous/Non-endemic
307	<i>Helicteres hirsuta</i> Lour.		Indigenous/Non-endemic
308	<i>Sterculia rubiginosa</i> Vent.		Indigenous/Non-endemic
309	<i>Theobroma cacao</i> L.		
310	<i>Waltheria americana</i> L.		Introduced-naturalized
Family Thymelaeaceae			
311	<i>Phaleria</i> sp.		
312	<i>Wikstroemia</i>		
Family Tiliaceae			
313	<i>Colona serratifolia</i> Cav.	Anilao	Indigenous/Non-endemic
314	<i>Grewia eriocarpa</i> Juss.		Indigenous/Non-endemic
315	<i>Grewia</i> sp.		
316	<i>Triumfetta rhomboidea</i> Jacq.		Introduced-naturalized
317	<i>Triumfetta</i> sp.		
Family Ulmaceae			
318	<i>Celtis</i> sp.		
Family Umbelliferae			
319	<i>Centella asiatica</i> (L.) Urban		Indigenous/Non-endemic
Family Urticaceae			
320	<i>Leucosyke capitellata</i> (Poir.) Wedd	Alagasi	Indigenous/Non-endemic
321	<i>Leucosyke brunnescens</i> C Robinson		Endemic
322	<i>Villebrunea trinervis</i> Wedd.	Alilaua	Indigenous/Non-endemic
Family Verbenaceae			
323	<i>Callicarpa formosana</i> Rolfe		Indigenous/Non-endemic
324	<i>Clerodendrum minahassae</i> Teijsm. & Binn.	Bagawak	Indigenous/Non-endemic
325	<i>Clerodendrum</i> sp.		
326	<i>Gmelina arborea</i> Roxb.		Introduced-naturalized
327	<i>Lantana camara</i> L.		Introduced-naturalized
328	<i>Phyla nodiflora</i> (L.) Greene		Indigenous/Non-endemic
329	<i>Premna odorata</i> Blanco	Alagao	Indigenous/Non-endemic
330	<i>Premna</i> sp.		
331	<i>Stachytarpheta jamaicensis</i> (L.) Vahl		Introduced-naturalized
332	<i>Tectona grandis</i> L.		Introduced-naturalized
333	<i>Vitex parviflora</i> Juss.	Molave	Indigenous/Non-endemic/EN*/VU^
334	<i>Vitex quinata</i> (Lour.) FN Will.		Indigenous/Non-endemic
335	<i>Vitex trifolia</i> L.		Indigenous/Non-endemic
Family Vitaceae			
336	<i>Cayratia</i> sp.		
337	<i>Cissus</i> sp.		
338	<i>Tetrastigma harmandii</i> Planch.		Indigenous/Non-endemic
339	<i>Tetrastigma</i> sp.		

Legend: * DAO – 2007-01

^ 2008 IUCN Red List of Threatened Species

Appendix 4. List of species of birds observed within the project site.

	Family/Scientific Name	Common Name	Distribution and Conservation Status
Family Anatidae			
1	<i>Anas luzonica</i>	Philippine Duck	Philippine Endemic-Common / Vulnerable (DAO/IUCN)
Family Accipitridae			
2	<i>Accipiter gularis</i>	Japanese Sparrowhawk	Migrant-Uncommon (CITES II)
3	<i>Butastur indicus</i>	Grey-faced Buzzard	Migrant-Fairly Common (CITES II)
4	<i>Haliastur indus</i>	Brahminy Kite	Resident-Common (CITES II)
5	<i>Hieraeetus kienerii</i>	Rufous-bellied Eagle	Resident - Uncommon (CITES II)
6	<i>Pernis ptilorhynchus</i>	Oriental Honeybuzzard	Resident/Migrant-Common
7	<i>Spilornis cheela</i>	Crested Serpent-eagle	Resident – Common
Family Phasianidae			
8	<i>Coturnix chinensis</i>	Blue-breasted Quail	Resident-Common
9	<i>Coturnix sp.</i>	Quail	Resident
10	<i>Gallus gallus</i>	Red Junglefowl	Resident – Common
Family Turnicidae			
11	<i>Turnix ocellata</i>	Spotted Buttonquail	Philippine Endemic – Common
12	<i>Turnix sylvatica</i>	Small Buttonquail	Resident-Common
Family Rallidae			
13	<i>Amaurornis phoenicurus</i>	White-breasted Waterhen	Resident – Common
14	<i>Gallirallus torquatus</i>	Barred Rail	Resident-Common
Family Scolopacidae			
15	<i>Gallinago megala</i>	Swinhoe's Snipe	Migrant-Common
Family Columbidae			
16	<i>Chalcophaps indica</i>	Common Emerald	Resident – Common
17	<i>Geopelia striata</i>	Zebra Dove	Resident – Common
18	<i>Macropygia phasianella</i>	Reddish Cuckoo-Dove	Resident-Common
19	<i>Phapitreron amethystina</i>	Amethyst brown Dove	Philippine Endemic – Common
20	<i>Phapitreron leucotis</i>	White-eared Brown Dove	Philippine Endemic – Common
21	<i>Ptilinopus leclancheri</i>	Black-chinned Fruit-dove	Near Endemic – Uncommon
22	<i>Ptilinopus occipitalis</i>	Yellow-breasted Fruit-Dove	Philippine Endemic – Common
23	<i>Streptopelia bitorquata</i>	Island Collared-Dove	Resident-Uncommon
24	<i>Streptopelia chinensis</i>	Spotted Dove	Resident- Common
25	<i>Streptopelia tranquebarica</i>	Red Turtle-Dove	Resident - Fairly Common
26	<i>Treron pompadora</i>	Pompadour Green-Pigeon	Resident-Common
27	<i>Treron vernans</i>	Pink-necked Green-Pigeon	Resident-Common
Family Psittacidae			
28	<i>Bolbopsittacus lunulatus</i>	Guaiabero	Philippine Endemic – Common
29	<i>Loriculus philippensis</i>	Colasisi	Philippine Endemic – Common
Family Cuculidae			
30	<i>Cacomantis merulinus</i>	Plaintive Cuckoo	Resident – Common
31	<i>Cacomantis variolosus</i>	Brush Cuckoo	Resident – Common
32	<i>Centropus benghalensis</i>	Lesser Coucal	Resident – Common
33	<i>Centropus unirufus</i>	Rufous Coucal	Philippine Endemic – Uncommon
34	<i>Centropus viridis</i>	Philippine Coucal	Philippine Endemic – Common
35	<i>Cuculus pectoralis</i>	Philippine Hawk-Cuckoo	Philippine Endemic
36	<i>Cuculus cf. fugax</i>	Cuckoo	

	Family/Scientific Name	Common Name	Distribution and Conservation Status
37	<i>Eudynamys scolopacea</i>	Common Koel	Resident-Locally Common
38	<i>Phaenicophaeus cumingi</i>	Scale-feathered Malkoha	Luzon Endemic - Fairly Common
39	<i>Phaenicophaeus superciliosus</i>	Red-crested Malkoha	Luzon Endemic - Fairly Common
Family Strigidae			
40	<i>Bubo philippensis</i>	Philippine Eagle-Owl	Philippine Endemic - Uncommon / Vulnerable(DAO/IUCN) (CITES II)
41	<i>Ninox philippensis</i>	Philippine Hawk-owl	Philippine Endemic – Common (CITES II)
42	<i>Otus megalotis</i>	Philippine Scops-Owl	Philippine Endemic – Common (CITES II)
43	<i>Tyto capensis</i>	Grass Owl	Resident-Fairly Common (CITES II)
Family Caprimulgidae			
44	<i>Caprimulgus manillensis</i>	Philippine Nightjar	Resident – Common
45	<i>Eurostopodus macrotis</i>	Great-eared Nightjar	Resident – Common
Family Apodidae			
46	<i>Apus pacificus</i>	Fork-tailed Swift	Resident – Common
47	<i>Collocalia vanikorensis</i>	Island Swiftlet	Resident – Common
48	<i>Collocalia esculenta</i>	Glossy Swiftlet	Resident – Common
49	<i>Collocalia troglodytes</i>	Pygmy Swiftlet	Philippine Endemic – Fairly Common
Family Hemiprocidae			
50	<i>Hemiprocne comata</i>	Whiskered Tree Swift	Resident-Fairly Common
Family Alcedinidae			
51	<i>Actenoides lindsayi</i>	Spotted Wood-Kingfisher	Philippine Endemic-Fairly Common
52	<i>Alcedo cyanopecta</i>	Indigo-banded Kingfisher	Philippine Endemic - Uncommon
53	<i>Halcyon chloris</i>	White-collared Kingfisher	Resident - Common
54	<i>Halcyon smyrnensis</i>	White-throated Kingfisher	Resident Fairly Common
Family Meropidae			
55	<i>Merops philippinus</i>	Blue-tailed Bee-eater	Resident-Fairly Common
56	<i>Merops viridis</i>	Blue-Throated Bee-eater	Resident - Fairly Common
Family Bucerotidae			
57	<i>Buceros hydrocorax</i>	Rufous Hornbill	Philippine Endemic - Common (VU-DAO; NT-IUCN; CITES II)
58	<i>Penelopides panini manillae</i>	Tarictic Hornbill	Philippine Endemic - Common
Family Capitonidae			
59	<i>Megalaima haemacephala</i>	Coppersmith barbet	Resident - Common
Family Picidae			
60	<i>Dendrocopus maculatus</i>	Philippine Pygmy Woodpecker	Philippine Endemic - Common
Family Pittidae			
61	<i>Pitta sordida</i>	Hooded Pitta	Resident - Common
Family Hirundinidae			
62	<i>Cecropis striolata</i>	Striated Swallow	Resident
63	<i>Hirundo rustica</i>	Barn Swallow	Migrant-Common
64	<i>Hirundo tahitica</i>	Pacific Swallow	Resident - Common
Family Campephagidae			
65	<i>Coracina striata</i>	Bar-bellied Cuckoo-shrike	Resident-Common
66	<i>Lalage nigra</i>	Pied Triller	Resident - Common
Family Pycnonotidae			
67	<i>Hypsipetes philippinus</i>	Philippine Bulbul	Philippine Endemic - Common

	Family/Scientific Name	Common Name	Distribution and Conservation Status
68	<i>Pycnonotus goiavier</i>	Yellow-vented Bulbul	Resident - Common
69	<i>Pycnonotus urostictus</i>	Wattled Bulbul	Philippine Endemic
Family Dicruridae			
70	<i>Dicrurus balicassius</i>	Balicassiao	Philippine Endemic – Common
Family Oriolidae			
71	<i>Irena cyanogaster</i>	Philippine Fairy-Bluebird	Philippine Endemic – Common
72	<i>Oriolus chinensis</i>	Black-naped oriole	Resident – Common
Family Corvidae			
73	<i>Corvus enca</i>	Slender-billed Crow	Resident-Locally Common
74	<i>Corvus macrorhynchos</i>	Large-billed Crow	Resident-Common
Family Paridae			
75	<i>Parus elegans</i>	Elegant Tit	Philippine Endemic – Common
Family Rhabdornithidae			
76	<i>Rhabdornis mystacalis</i>	Striped-headed Rhabdornis	Philippine Endemic – Common
Family Timaliidae			
77	<i>Stachyris striata</i>	Luzon Striped-Babbler	Luzon Endemic – Uncommon
Family Turdidae			
78	<i>Copsychus luzoniensis</i>	White-browed Shama	Philippine Endemic – Uncommon
79	<i>Copsychus saularis</i>	Oriental Magpie-robin	Resident – Uncommon
80	<i>Luscinia caliope</i>	Siberian Rubythroat	Migrant-Uncommon
81	<i>Saxicola caprata</i>	Pied Bushchat	Resident – Common
82	<i>Turdus chrysolaus</i>	Brown-headed Thrush	Migrant-Uncommon
83	<i>Turdus obscurus</i>	Eyebrowed Thrush	Migrant-Uncommon
Family Sylviidae			
84	<i>Cisticola exilis</i>	Bright-capped Cisticola	Resident – Common
85	<i>Cisticola juncidis</i>	Zitting Cisticola	Resident-Common
86	<i>Gerygone sulphurea</i>	Golden-bellied Flyeater	Resident-Locally Common
87	<i>Megalurus palustris</i>	Striated Grassbird	Resident – Common
88	<i>Megalurus timoriensis</i>	Tawny Grassbird	Resident – Common
89	<i>Orthotomus castaneiceps</i>	Philippine Tailorbird	Philippine Endemic - Common
90	<i>Orthotomus derbianus</i>	Grey-backed Tailorbird	Luzon Endemic - Common
91	<i>Phylloscopus borealis</i>	Arctic Warbler	Migrant – Common
92	<i>Phylloscopus cebuensis</i>	Lemon-throated Leaf-Warbler	Philippine Endemic - Common
Family Muscicapidae			
93	<i>Cyornis herioti</i>	Blue-breasted Flycatcher	Luzon Endemic – Common
94	<i>Cyornis rufigaster</i>	Mangrove Blue Flycatcher	Resident – Common
95	<i>Eumyias panayensis</i>	Mountain Verditer-Flycatcher	Resident – Common
96	<i>Hypothymis azurea</i>	Black-naped monarch	Resident – Common
97	<i>Ficedula narcissina</i>	Narcissus Flycatcher	Migrant – Rare
98	<i>Ficedula westermanni</i>	Little Pied Flycatcher	Resident-Fairly Common
99	<i>Muscicapa greseiatica</i>	Grey-streaked Flycatcher	Migrant-Common
100	<i>Rhipidura cyaniceps</i>	Blue-headed Fantail	Endemic – Common
101	<i>Rhipidura javanica</i>	Pied Fantail	Resident – Common
Family Pachycephalidae			
102	<i>Pachycephala philippinensis</i>	Yellow-breasted whistler	Philippine Endemic – Common
Family Motacillidae			
103	<i>Anthus novaeseelandiae</i>	Richard's Pipit	Resident – Common

	Family/Scientific Name	Common Name	Distribution and Conservation Status
104	<i>Motacilla cinerea</i>	Grey Wagtail	Migrant – Common
105	<i>Motacilla alba</i>	Yellow Wagtail	Migrant-Rare
Family Artamidae			
106	<i>Artamus leucorhynchus</i>	White-breasted Woodswallow	Resident – Common
Family Laniidae			
107	<i>Lanius cristatus</i>	Brown Shrike	Migrant – Common
108	<i>Lanius schach</i>	Long-tailed Shrike	Resident – Common
Family Sturnidae			
109	<i>Acridotheres cristatellus</i>	Crested Myna	Resident – Common
110	<i>Sarcops calvus</i>	Coletto	Near Endemic-Common
Family Nectariniidae			
111	<i>Aethopyga pulcherrima</i>	Metallic-winged Sunbird	Philippine Endemic-Common
112	<i>Anthreptes malacensis</i>	Plain-throated Sunbird	Resident – Common
113	<i>Arachnothera clarae</i>	Naked-faced Spiderhunter	Philippine Endemic-Uncommon
114	<i>Nectarinia jugularis</i>	Olive-backed sunbird	Resident – Common
115	<i>Nectarinia sperata</i>	Purple-throated sunbird	Resident – Common
Family Dicaeidae			
116	<i>Dicaeum australe</i>	Red-keeled Flowerpecker	Philippine Endemic - Common
117	<i>Dicaeum bicolor</i>	Bicolored Flowerpecker	Philippine Endemic- Uncommon
118	<i>Dicaeum hypoleucum</i>	Buzzing Flowerpecker	Philippine Endemic-Common
119	<i>Dicaeum pygmaeum</i>	Pygmy Flowerpecker	Philippine Endemic - Common
120	<i>Dicaeum trigonostigma</i>	Orange-bellied Flowerpecker	Resident – Common
Family Zosteropidae			
121	<i>Zosterops meyeri</i>	Lowland white-eye	Luzon Endemic Common
122	<i>Zosterops nigrorum</i>	Yellowish White-eye	Philippine Endemic - Common
Family Estrilidae			
123	<i>Lonchura leucogastra</i>	White-bellied Munia	Resident-Common
124	<i>Lonchura malacca</i>	Chestnut Munia	Resident – Common
125	<i>Lonchura punctulata</i>	Scaly-breasted Munia	Resident – Common

Appendix 5. List of species of mammals caught within the project site. (Identification and status based on Heaney et al. 1998).

Family/Scientific Name		Common Name	Distribution and Conservation Status
ORDER INSECTIVORA			
Family Soricidae			
1	<i>Suncus murinus</i>	House Shrew	Non-native-Abundant
2	<i>Crocidura cf grayi</i>	Luzon Shrew	Endemic
ORDER RODENTIA			
Family Muridae			
3	<i>Rattus everetti</i>	Common Philippine Forest Rat	Endemic - Abundant
4	<i>Rattus exulans</i>	Polynesian Rat	Non-native-Abundant
5	<i>Rattus tanezumi</i>	Oriental House Rat	Non-native-Abundant
6	<i>Apomys sp.</i>	Forest Mouse	Endemic
7	<i>Chrotomys cf mindorensis</i>	Mindoro Striped Rat	Endemic
ORDER CHIROPTERA			
Family Pteropodidae			
8	<i>Cynopterus brachyotis</i>	Common Short-nosed Fruit Bat	Widespread-Abundant
9	<i>Macroglossus minimus</i>	Dagger Toothed Fruit Bat	Widespread-Abundant
10	<i>Ptenochirus jagori</i>	Musky Fruit Bat	Endemic-Common
11	<i>Rousettus amplexicaudatus</i>	Common Rousette Bat	Widespread-Abundant
Family Rhinolopidae			
12	<i>Hipposideros diadema</i>	Diadem Roundleaf Bat	Widespread-Common
13	<i>Hipposideros ater</i>	Dusky Roundleaf Bat	Widespread-Uncommon
14	<i>Hipposideros cf. obscurus</i>	Philippine Forest Roundleaf Bat	Endemic-Widespread
15	<i>Rhinolophus arcuatus</i>	Arcuate Horseshoe Bat	Widespread-Common
16	<i>Rhinolophus philippinensis</i>	Enormous-eared Horseshoe Bat	Uncommon
17	<i>Rhinolophus cf rufus</i>	Large Rufous Horseshoe Bat	Endemic - Uncommon
18	<i>Rhinolophus virgo</i>	Yellow-faced Horseshoe Bat	Endemic - Moderately Common
Family Vespertilionidae			
19	<i>Kerivoula whiteheadi</i>	Whitehead's Wooly Bat	Widespread-Common
20	<i>Miniopterus australis</i>	Little Bent-winged Bat	Widespread-Common
21	<i>Murina cyclotis</i>	Round-eared Tube-nosed Bat	Widespread-Common
Family Mollosidae			
22	<i>Chaerophon plicata</i>	Wrinkle-lipped Bat	Widespread-Uncommon

Appendix 6. Land-Use Changes in Different Spatiotemporal Scales

Our discussion of baseline land-use scenario and deforestation rate for the project area was based on 41km x 46km area (Table A).

We made the above analysis within the image frame of 164,680 hectares as this should reflect the average land-cover change situation within the protected area. We looked at this larger area to minimize sampling error by averaging out the stochastic nature or the random variability of land cover change and avoid classification bias (to curtail the analysts' subjective judgment to benefit our own purpose). Moreover, by studying the larger area, we have basis to determine the baseline deforestation rate when we review it again in ten years. Further basis for this analytical frame is our observation that by taking smaller area samples systematically within this frame resulted to varying rates of deforestation and even forestation or regrowth. This can be exhibited and discussed in the following paragraphs by using our sample areas taking into consideration the project site (includes plantable and non-plantable areas) of 2,943 hectares, the main project area (target plantable areas only) of 2,500 hectares (which is the target area for the success of project implementation) and the project zone (which includes the project area, project boundary and the area of influence of the project beyond the project area) of 10,886.5 hectares.

We re-analyzed the 1989-2007 satellite image pairs by using sub-classes of forest as open and close canopies and then splitting the analysis into two time-periods 1989-2000 and 2000-2007. These two periods were chosen based on a systematic decade split considering that year 2000 represented an important census year in the country. We then did re-sampling to demonstrate stochasticity within the 2,500 hectares, 2,943 hectares and 10,886.5 hectares, which were, respectively, the project site, project area and project zone. Tables B and C denote the change within the image frame, project site (2,943 has.), project area (2,500 has) and project zone (10,886.5 has.), respectively. Note that the area size of the image frame may vary depending on the image extent and also the cloud cover and shadow, which were removed from the analysis to make a cloud-free comparison. Observe that when the whole image is the analytical sample, the 1989-2000 change analysis reported deforestation while the 2000-2007 change showed forestation. Surprisingly, when we analyzed the project zone sample, the results showed the opposite situation, because between 1989-2000 there was forestation while between 2000-2007 there was deforestation. Within the project site sample, between 1989-2000 there was forestation while between 2000-2007 there was deforestation. Subsequently, in the project area sample, between 1989-2000 there was forestation while between 2000-2007 there was deforestation. Consistently, the project zone, project site and project area denoted very similar trend in forestation in the earlier period and deforestation in the latter period. This was quite the opposite of the trend when the whole image sample was analyzed indicating deforestation and forestation in the earlier and latter periods, respectively.

The trend of forestation (1989-2000) to deforestation (2000-2007) status in the small sampled areas pertaining to the project zone, project site and project area might be

attributed to stricter forestry law enforcement through confiscation of illegally cut logs by the DENR/MFPC, but which funding support ended in the mid 1990s. Community focus-group discussions indicated that there were less settlement areas in the uplands of Peñablanca Protected Landscape before its expansion into a Seascape in 2003. The settlements were increasing in the latter part of 1990s towards 2000s that led, perhaps, to more upland farms being created, land clearing through extraction or cutting of trees, pasturing and also occurrences of grassfires in the pyrogenous vegetation of the project site. In this situation it appears then that in the project zone or project area forest regrowth must have peaked during year 2000, but declined as human activities prevailed in the succeeding year. The opposite trend, however, when viewing a larger (image) area compared to that of the smaller areas might indicate a difference in treatment or policy abiding between the larger and the smaller areas. On a larger scale of the protected area the momentum for clear-cutting trees must have slowed down to encourage regrowth in the year 2000s due to the expansion of the protected area in 2003 beyond the project zone. In contrast, this project being already the locus of development went unabated and might continue in its business-as-usual if no reforestation project happens. Considering the above seemingly random variability and sampling effect, therefore, we preferred to use the change analysis from Table A to determine the deforestation rate for the locality. This analysis covers the entire area within the satellite image pair of the time periods of 1989 and 2007 to obtain a more objective value for the deforestation rate, which averages out the stochastic nature of change, and avoids classification and sampling bias.

There is, however, one obvious trend in the change tables, which show the growth of teak/gmelina trees for the two periods and for all the sampled areas from the entire image to the project area. Although this may seemingly challenge the additionality of the project, we defend the project's additionality on the ground that any expansion of teak/gmelina is done with intention to harvest the trees when mature. The value of these trees for furniture-making supports that this is a reasonable assumption. Gmelina has become a substitute for narra as furniture material and teak being used for house construction. Furthermore, teak/Gmelina plantations do not provide as much biodiversity benefit as the project reforestation activity is expected to provide.

Table A Land cover change between 1989-2007*.

Land Cover	1989 (ha)	2007 (ha)	difference	Average Annual Change	
				(ha/yr)	(%)
Cultivated area	39,812.5	45,261.2	5,448.7	302.7	0.76
Built-up	2,304.5	4,203.1	1,898.5	105.5	4.58
Teak/Gmelina	1,468.0	2,526.1	1,058.1	58.8	4.00
Riverbank	908.6	2,119.0	1,210.4	67.2	7.40
Water	6,841.2	3,876.9	-2,964.3	-164.7	-2.41
Bare	459.5	1,289.0	829.5	46.1	10.03
Grassland	34,725.1	27,004.8	-7,720.2	-428.9	-1.24
Shrubland	3,088.3	4,505.8	1,417.5	78.7	2.55
Open canopy forest	24,383.3	23,046.9	-1,336.4	-74.2	-0.30
Closed canopy forest	50,689.3	50,847.5	158.2	8.8	0.02
Total Area =	164,680	164,680	0.0	0.0	

*Based on satellite image dimensions: width =40,950.00m; height =45,852.75m

Table B Forest cover change from 1989 to 2000

Forest Sub-Classes	Area (hectares)	Difference	Rate per year
Change within the 129,693 ha. image frame			
1989 open canopy forest	20,398.34	-393.47	-314.00
2000 open canopy forest	20,004.97		
1989 closed canopy forest	21,790.98	-3,060.61	
2000 closed canopy forest	18,730.37		
1989 teak/Gmelina	1,401.76	507.98	46.18
2000 teak/Gmelina	1,909.74		
Change within the 2,943 ha. project site			
1989 open canopy forest	860.45	204.65	20.27
2000 open canopy forest	1,065.10		
1989 closed canopy forest	25.69	18.31	
2000 closed canopy forest	44.00		
1989 teak/Gmelina	165.53	135.98	12.36
2000 teak/Gmelina	301.51		
Change within the 2,500 ha. project area (excludes non plantable areas of the site)			
1989 open canopy forest	662.14	183.56	18.00
2000 open canopy forest	845.70		
1989 closed canopy forest	18.82	14.48	
2000 closed canopy forest	33.30		
1989 teak/Gmelina	139.46	115.58	10.51
2000 teak/Gmelina	255.04		
Change within the 10,886.5 ha. project zone			
1989 open canopy forest	2,528.88	284.66	25.45
2000 open canopy forest	2,813.54		
1989 closed canopy forest	490.78	-4.72	
2000 closed canopy forest	486.06		
1989 teak/Gmelina	400.93	282.82	25.71
2000 teak/Gmelina	683.75		

Table C Forest cover change from 2000 to 2007

Forest Sub-Classes	Area (hectares)	Difference	Rate per year
Change within the 142,463 ha. image frame			
2000 open canopy forest	21,996.1	943.80	320.79
2007 open canopy forest	21,052.3		
2000 closed canopy forest	20,335.8	3189.30	
2007 closed canopy forest	23,525.1		
2000 teak/Gmelina	2,038.44	514	73.43
2007 teak/Gmelina	2,552.44		
Change within the 2,943 ha. project site			
2000 open canopy forest	1,111.4	-191.20	-21.97
2007 open canopy forest	920.2		
2000 closed canopy forest	49.52	37.38	
2007 closed canopy forest	86.90		
2000 teak/Gmelina	306.7	42.5	6.07
2007 teak/Gmelina	349.2		
Change within the 2,500 ha. project area (excludes non plantable areas of the site)			
2000 open canopy forest	886.3	-157.1	-18.30
2007 open canopy forest	729.2		
2000 closed canopy forest	37.81	28.99	
2007 closed canopy forest	66.80		
2000 teak/Gmelina	259.8	31.80	4.54
2007 teak/Gmelina	291.6		
Change within the 10,886.5 ha. project zone			
2000 open canopy forest	2955.9	-373.5	-30.37
2007 open canopy forest	2582.4		
2000 closed canopy forest	701.12	160.91	
2007 closed canopy forest	862.03		
2000 teak/Gmelina	709.89	150.48	21.50
2007 teak/Gmelina	860.37		

Appendix 7. PPSRP Safety Manual for project implementors, partners and workers

PHILIPPINE PEÑABLANCA SUSTAINABLE REFORESTATION PROJECT (PPSRP)
Peñablanca Protected Landscape and Seascape (PPLS)
Peñablanca, Cagayan

Updated: December 04, 2009

The objective of this manual is to help ensure the safety of every person involved in the field implementation of the project against the dangers of injury, sickness or death through safe and healthy working conditions, thereby assuring the conservation of valuable manpower resources and the prevention of loss or damage to lives, consistent with project commitment for the total development of every worker. This manual shall apply to all the activities under the Reforestation, Agroforestry and Protection components of the project. This manual shall be useful to the project's technical and field staff, nursery caretakers, Project Partners, Community Reforestation Guards (CRG), Reforestation laborers and Agroforestry participants in the safety implementations on risk-prone activities.

FIELD ACTIVITIES UNDER THE PPSRP WITH ANTICIPATED RISK OR HAZARD

Activities	Possible Risk or Hazard
Nursery Activities	: ○ Snake/ insect bite during conduct of weeding ○ Injury due to sharp edges or sharp tools like knife, bolo, pruning shares while doing nursery works
Handling of Agricultural Chemicals	: ○ Skin/ eye irritation and choking during application and handling of such chemicals
Field Activities	: ○ Reforestation/ Enhancement planting laborers, partners as well as Field Staff may also be exposed to another health risk like diarrhea brought about by contaminated water especially during rainy season. Not to mention the additional health risks such as fever, flu, etc cause by the unpredicted weather condition in the area
Forest/ Grass Fire Suppression	: ○ Forest/ grass fires threatens fire suppression team with combination of excessive smoke and scorching heat caused by the fire as well as minor or major burns in the skin
Patrolling Operations	: ○ patrolling members may encounter hot-headed offenders who may cause physical harm to them
Evaluation of	: ○ Hired evaluators from the local community faces risks during

Reforestation Area the conduct of evaluation activities for the planted reforestation area especially so that some of the areas that they will evaluate (Quarterly Maintenance or New Planting Evaluations) have sharp limestone which might injure the evaluators. Another risk is attack by wildlife such as snakes or bites by harmful insects

I. PROJECT WORKERS AND SAFETY

Under the project, we identify the various groups who are implementing the different comprehensive site development activities with different scheme of consideration in terms of security and safety.

A. GROUPS WORKING WITHIN THE PROJECT

1. Project staff employed under Conservation International Philippines (CIP)

a. CIP staff

>Task Order – this is a contractual position hired to focus on delivering or performing specific tasks with accident insurance provided by the project.

>Short-term/fixed term – this is a position hired for short term, project-based.

>Regular staff – staff with permanent position.

b. Security and safety for the project should provide to field staff:

- The project provides 1 year duration accident group insurance (for Task Order positions).
- For Short-term/fixed term/Regular staff, the CIP through the project will be providing medical plan, life and accident insurance to include share of CIP in paying contributions to Social Security System (SSS), Philippine Health Insurance (PhilHealth) Corporation and Home Development Mutual Fund (Pag-Ibig).

c. Office Protocols for field staff

- For project field staff, always update the effectivity of the accident/medical insurance. Make sure that it is always up to date or have been filed by the office;
- For project staff and partners, make it sure that travel request and other travel forms prior to field activities should be filled in their respective offices signed by their immediate supervisors before the conduct of the field activities for

security reasons. Travel itinerary and duration of the travel must also be included in the travel request;

- Bring mobile phones or alternative communication equipments with full charge batteries and extra batteries;
- Field staff should not do field work alone especially in areas where mobile phone signal is not available. Always invite someone from the office or from the Barangay officials, Barangay Police/ Tanod or representative from PNP and DENR for precautionary measure;
- In areas where mobile phone signal is available, make sure that the cellular phone is always turned on just in case immediate help is needed by other staff and workers;
- Do not forget to bring bottle of water for safe drinking and avoid drinking water from suspected contaminated sources;
- Always bring a knife or a jungle bolo for general purposes;
- Bring raincoat to avoid getting wet during rainfall;
- Never forget to bring medicines or medicine kit;
- Always have a lighter or a match for making smoke signal (controlled burning) just in case you need help and wanted someone to easily identify your location;
- Always try to sleep in the bunkhouse if possible to avoid risks of staying anywhere during the night;
- Contact the office regularly for safety monitoring purpose especially if problem in the field arise; and
- Make it sure to have important contact numbers in case of emergencies.

d. **Some safety paraphernalia to consider when going to the field:**

- Flashlights;
- Sleeping bags;
- Mobile phone load allowance;
- Rubber boots;
- Backpacks;
- Raincoats;
- Jungle knife/ bolo;
- First aid medicines;
- A good tent: 4 man tent, rain tarp, ground sheet; and
- 1 digital camera per group for documentation

2. Staff from partner agencies (LGU, DENR) providing support and assistance in the project implementation

The project partners under the project MOU have field staff from their agencies to render assistance and support in the field implementation of the project. From the DENR, Forest Rangers from the CENR Office are the direct personnel who will be working in the field to be led by the Protected Area Superintendent (PASu) assigned at Peñablanca Protected Landscape and Seascape (PPLS). In the

Peñablanca LGU, representatives come from the Municipal Environment and Natural Resources Office (MENRO) or designees.

Both representatives from LGU and DENR are covered for their safety by their respective offices.

3. Community leaders and Barangay Police/ Tanod who are providing support in the forest protection aspect

From the community level, the supervision of the deputized Barangay Tanod/ Police or the Community Reforestation Guards (CRG) will be the task of the Barangay officials, particularly the Barangay Captain. The actual ground works by the Community Reforestation Guards (CRGs) such as patrolling the area against stray animals and fire prevention /suppression activities will be part of the daily routine of the CRGs.

Under the forest protection component of the project, CRGs must have group accident insurance or PhilHealth coverage. The project provides daily food allowances for every CRG on- duty who will be rendering their services in a scheduled basis as instructed by the Barangay Captain.

4. Project Participants and Hired Daily Laborers

For this group, the project will not be providing insurances but they will be provided with capacity building and training on safety matters in the field as discussed below.

B. CAPACITY BUILDING / TRAININGS

As part of the project strategies and implementation guidelines, before the project starts, consultation with the communities and partners should be done to tackle all implementation strategies including safety measures both for the staff of the project, partners and laborers of the project.

Some of the capacity building activities includes but not limited to the following:

- Nursery establishments;
- Wildling collections;
- Plantation establishments;
- Forest protection and law enforcement;
- Fire protection and prevention;
- Fire suppression;
- Cooperative management;
- Agroforestry concept; and
- Mango care and production

II. PROPER CONDUCT OF PROJECT IMPLEMENTATION ACTIVITIES TO AVOID/MINIMIZE RISKS:

This safety guidelines is purposely done for the safety of all who are working under the PPSRP, not only for those who are doing the actual conduct of activities from the communities but including all technical staff working under the project to include the partners. This guideline will be the basis of emphasizing to everybody the safe way of executing work while on the field. During field implementation activities, the project staff will be include in the supervision and the detection of the potential risks and identification and set-up of necessary safety measures to avoid or minimize the identified potential risks. The supervisor should also constantly remind field implementers about personal safety as part of his regular daily tasks.

A. NURSERY ACTIVITIES

The following guidelines under the nursery activities shall be strictly followed in handling, transporting and storing nursery tools:

1. Tips on proper handling of sharp/pointed nursery tools

Mishandling of pointed and/ or sharp nursery tools may lead to handlers hurting themselves with these tools. Hence, in order to prevent such, the guidelines stated below shall be followed by all concerned staff and laborers:

- a. Nursery tools with pointed tips such as jungle knife, digging bars and etc. shall not be used in a playful manner by the laborers specially during the conduct of nursery activities because other laborers might be hurt accidentally;
- b. Nursery tools with sharp edges such as jungle knife, pruning shears, trimming scissors and etc. shall not be handled carelessly to avoid any injuries on the part of the handler and his/ her co- laborers;
- c. Work in the nursery must be properly distributed to the workers. Task that need to handle bolo or any related tools just should be assigned to male laborers;
- d. When working in the nursery using sharp bladed tools, avoid clustering. Workers should be working separately with space apart;
- e. Make it sure to the workers that those who are working with bolo must have holster; and
- f. Don't play with those sharp object while working in the nursery

2. Proper Storage of Pointed Tip and Sharp Edge Nursery Tools

- a. Before storing, the tools shall be cleaned after using;
- b. Nursery tools with pointed tip and sharp edge must be stored in a place wherein children can not reach them or in a tool box. Sharp edge of the jungle knives or jungle bolos must be properly secured. Ideally, in the absence of a knife holster, the sharp edges should be facing the bottom of the tool box so as not to injure the next user;

- c. Lubricants shall be applied on a regular basis in order to minimize or prevent the occurrence of rust.
- d. The project should build stock room for every main nursery for keeping tools

3. Proper attire

- a. Working bare footed in the nursery is highly not accepted. Wearing of old shoes or rain boots is recommended
- b. Wear globes if necessary

B. PROPER HANDLING OF AGRICULTURAL CHEMICALS

1. Safety Measures on Proper Handling, Transporting and Storing of Agricultural Chemicals. (Applicable for both liquid or solid, chemical or organic)

a. Tips on Pesticide Handling

- Pesticides shall be applied only as directed in the amount and in the manner specified in the label;
- Protective clothing and other protective gears such as gloves, masks, boots, etc. as indicated in the label shall be used;
- Smoking, drinking or eating while handling pesticides is prohibited. Hands, face or even the whole body shall be washed thoroughly using soap before smoking, drinking, eating and attending to personal needs;
- Pesticides spilled on the skin and clothing shall be immediately washed thoroughly with soap and clean running water. Spillage at the working area shall be immediately decontaminated prior to proper disposal;
- Persons using agricultural pesticides shall spray or apply these in the windward direction;
- Whenever pesticides are applied, entry to the area where the pesticides was applied shall be allowed only after a specified time and when properly protected;
- Agricultural pesticides shall be applied in such a manner that lakes, canals, rivers, or thickly populated places will not be polluted;
- Workers using pesticides shall not blow blocked spray pipes or nozzles with the mouth; and
- Always make is sure that any chemicals should be properly kept in the stock room or safety place out of reach of children

b. Tips on Transporting Pesticide

- Ensure that pesticides to be transported are tightly sealed to avoid spillage;
- Only safe and appropriate containers shall be used in transporting pesticides; and

- Pesticides shall not be borne directly on the back of workers or work animals for this may spill and cause damages to the skin of the worker or animal carrying it

c. Tips on Pesticide Storage

- Pesticides shall be stored in its original container and that the cap must be tightly closed;
- The precautions listed in the label shall be followed for the detailed storage of each compound;
- Pesticides shall be stored in cool, dry, and well ventilated places not accessible to children, animals and unauthorized persons and away from direct sunlight;
- Pesticides shall be stored away from foods, food preparation stuff and food preparation areas;
- Volatile pesticides shall always be stored separately from other pesticides to avoid cross contamination and shall always be stored in an unrestricted atmosphere; and
- Smoking, eating or drinking in the pesticide storage area is prohibited.

d. Safety Tips on Fertilizer Application

- Fertilizers shall not be left unattended when not in use;
- Spillage of fertilizers and contamination must be prevented. Spillage shall be thoroughly cleaned immediately;
- Workers using toxic fertilizers shall not:
 1. blow out blocked spray pipes or nozzle with the mouth;
 2. Spray or spread liquid fertilizers against the direction of the wind.
- Solid fertilizers must be handle and applied using prescribed gears such as face mask, cover all coats and gloves; and
- Handling of organic fertilizers shall be by mechanical means in order to minimize direct contact with such fertilizers or in the absence of mechanical means, proper protection during handling shall be required.

e. Tips on Fertilizer Storage

- Storage place for fertilizers shall be well lighted to facilitate easy identification of chemicals;
- Storage building shall be sound, weather-proof, water-tight and fire resistant;
- Storage rooms or buildings shall be locked to prevent entry of unauthorized persons or animals;
- Fertilizers shall be stored separately from other material and in particular, away from food, food preparation stuff and food preparation area;
- Fertilizers of different kinds shall be stored separately in sacks or containers on skids or platform and kept away from walls and combustible materials and with proper labels;

- Organic fertilizer shall be stored in well ventilated areas with coverings against rain and direct sunlight; and
- Fertilizers stored in containers other than those provided by the manufacturer shall be clearly labeled with the name of the substance and marked with proper symbols

2. Workers Hygiene

- a. After handling pesticides and harmful fertilizers, make it sure to do the following:
 - Change clothing after the work;
 - Do washing of hand, face / take a bath before eating; and
 - Remove all protective clothing and equipment at the end of each day's work and deposit them in specified decontaminating containers/ area provided for the purpose
- b. Protective clothing shall be laundered or otherwise thoroughly cleaned at least once a week or more frequently, depending upon the degree of the contamination and the material or substance used;
- c. Workers shall thoroughly wash gloves after every use
- d. Worker shall use eye protector, long sleeve dress and gas mask

C. PLANTATION ESTABLISHMENTS

Preparedness in the field during all situation must be observe by all person involved in the field implementation of the project. Enumerated below are some of the precautionary measures per activity that should be undertaken and some essential things that personnel should have while doing field work.

1. Safety guides for workers during planting activities

a. Tips in using planting tools

In the Plantation establishment activities such as blocking, site preparation, hauling, and planting involving the use of cutting/pointed tools—bolo for cutting and pointed digging bars for hole digging, the following safety guidelines should be followed:

- Use gloves when handling the digging bars for whole digging. Gloves will minimize injury to the hand of the planters due to the rough surface of the digging bar;
- When working in the field using sharp tools, don't work very closely with each other to avoid accident;
- Tightly grip the handle of the sharp cutting tools while doing the strip brushing or ring weeding in order to avoid these tools from slipping from

the hands of the user/ planter and prevent harm to other nearby or even to the planter himself;

- Involvement of below age during field activities must not be tolerated; and
- After using these tools, store them in a place where children can not reach them and wherein it will not pose potential harm to others.

b. Additional safety tips

- Workers shall always wear/bring with them rubber boots, cap, long sleeve/safety clothes, raincoat and gloves;
- Workers always bring with them medical kit/ first aid kit for emergency cases;
- Avoid roaming around the plantation site with no companion to avoid accident caused by snake bites or anything that may harm the worker unknown to his/her group;
- Avoid walking or hiking in a very steep slopes;
- Always observe proper time of going to and from the planting site since there is a danger of over exposure to sunlight; and
- Observe precautionary measures when using pointed sharp tools like bolo and crowbar in planting

b. Selection of Camping Site

- Camping sites should be located in open area away from tall trees;
- Near the source of potable water;
- Safe from flooding in case of heavy rain; and
- Safe from possible wildlife attack

2. Evaluation of reforestation area

Before and during the conduct of reforestation plantation evaluation, evaluators should make sure that they are properly equipped with safety gears and clothing to minimize unexpected injuries while conducting the activity. Listed below are some of the safety guideline that evaluator should follow to avoid such injuries.

- a. Prepare all documents and supplies needed during the evaluation;
- b. Wear rubber boots or rubber shoes to prevent injury to the feet just in case the evaluator accidentally stepped on a sharp rock or pointed twig or even thorns of plants;
- c. Wear long pants/ jeans and long sleeve shirts to avoid too much exposure to direct sunlight and scratches from thorns of plants;
- d. Be careful in walking. Average speed of walking is necessary specially when trekking in a forested part in going to area to be evaluated;
- e. Always bring medicine kit or medicines;
- f. Always bring flashlights;
- g. Be at the camp before dawn; there might be harmful nocturnal wild animals in the area;

- h. Raincoats is also needed just to be ready in case of rainfall; and
- i. Avoid entering into a discussion with the planters that may ignite into a brawl; using a low tone voice during conversations and discussions are recommended

D. FOREST PROTECTION AND PROJECT MONITORING

Field staff or communities engage in the project should be oriented on the following safety measures as stated in I.B above. The below activities with specific safety guide must be always observe.

1. Conduct of field monitoring activities

- a. For project staff and partners, make it sure that travel request and other forms prior to field activities should be filled in their respective offices signed by their immediate supervisors before proceeding into the field activities for security reason. Itinerary must also include in the travel request;
- b. Bring Mobile phone or alternative communication equipments with full charge batteries and extra batteries;
- c. Contact the office regularly for safety monitoring purpose especially if problem in the field arise;
- d. Make it sure that important contact numbers in case of emergencies is all with the field staff; and
- e. It must be always observe to have at least one companion when doing field works either other staff or community members

2. Fire prevention and suppression works

To avoid risks to project staff, partners and community reforestation guards from being hurt, burn, wounded during fire prevention and suppression activities, the project should provide trainings (stated in I.B), tools and equipments listed below.

Protocol for on- duty Community Reforestation Guards (CRGs)

- To always carry or bring with them some medicine from the first aid kits placed in the main nurseries and look- out towers. In case of fire occurrence, there will be someone to bring the first aid kit immediately in the site. This will be for everybody who are doing the fire suppression activities;
- Always bring bolo with holster;
- Emergency light/ flashlight;
- Always wear rubber shoes / rain boots, long sleeves; and
- In the lookout tower, drum/water containers, rake, shovel, back pack sprayer will be provided to be used by the CRGs on- duty during fire occurrence

References used in making this Safety Manual:

- ILO. 1998. Safety and health in forestry work
- Occupational Safety and Health Standards, as amended. Department of Labor and Employment. Manila

End

Appendix 8. PACBRMA Guidelines (DAO 2004-32)



Republic of the Philippines
Department of Environment and Natural Resources
Visayas Avenue, Diliman, Quezon City
Tel Nos. (632) 929-66-28 to 29 (632) 929-62-52
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AUG 31 2004

DENR Administrative Order No. 2004 - 32

SUBJECT : Revised Guidelines on the Establishment and Management of Community-Based Program in Protected Areas

Pursuant to Republic Act No. 7586 (National Integrated Protected Areas System (NIPAS) Act of 1992), DENR Administrative Order No. 25, Series of 1992 (Implementing Rules and Regulations of NIPAS Act), and Executive Order No. 263 (Adopting Community-Based Forest Management as the National Strategy to Ensure the Sustainable Development of the Country's Forestlands Resources and Providing Mechanisms for its Implementation), and to facilitate the implementation of the Community Based Program (CBP) in Protected Areas, DAO 2002-02 (Guidelines on the Establishment and Management of Community-Based Program in Protected Areas) is hereby revised.

Section 1. Basic Policy. It is the basic policy of the Department to promote the conservation of biodiversity and sustainable development in protected areas and buffer zones in order to maintain essential ecological processes and life support systems which will enhance peoples' capacity to sustain human life and development, as well as plants and animals.

Towards this end, the Department would provide tenured migrant communities and interested indigeneous peoples within protected areas and buffer zones, tenure over established CBP areas, provided that the activities to be undertaken are consistent with the Protected Area Management Plan (PAMP).

Section 2. Definition of Terms. As used in this Order, the following shall mean:

Allowable zones - management zones of the protected area where sustainable development and/or resource utilization is allowed.

Community Based Program (CBP) - a program that gives opportunities to organized tenured migrant communities and indigeneous peoples to manage, develop, utilize, conserve and protect the resources within the zones of the protected area and buffer zones consistent with the PAMP.

CBP area - portion of the allowable zones of the protected area and buffer zones where the CBP can be undertaken consistent with the PAMP.

Community Resource Management Plan (CRMP) – the plan of the Protected Area Community Based Resource Management Agreement (PACBRMA) Holder on how to manage and benefit from the resources in the CBP area on a sustainable basis.

Integrated Protected Area Fund (IPAF) – a trust fund established for purposes of financing projects of the NIPAS.

Mangrove reserves – areas covered under Proclamation No. 2152 (Declaring the entire province of Palawan and certain parcels of the public domain and/or parts of the country as Mangrove Swamp Forest Reserve) and all other areas proclaimed, designated or set aside, pursuant to a law, presidential decree, presidential proclamation or executive order before the effectivity of the NIPAS Act.

People's Organization – a group of organized tenured migrant communities and/or interested indigenous peoples which may be an association, cooperative, federation, or other legal entity, established to undertake collective action to address community concerns and needs, and mutually share the benefits of the endeavor.

Prior vested rights – acknowledged claims, privileges, prerogatives, or ownership over land or natural resources to which one is entitled to by reason of law, license, contract, or tradition.

Protected Area Community Based Resource Management Agreement (PACBRMA) – an agreement entered into by and between the DENR and the organized tenured migrant communities or interested indigenous peoples in protected areas and buffer zones which has a term of twenty-five (25) years and renewable for another twenty-five (25) years.

Protected Area Management Plan (PAMP) – refers to either the Initial Protected Area Plan (IPAP) or the General Management Plan (GMP) which contains the rationale for the protected area establishment; proposed boundaries including buffer zones; and, designation of management zones, including buffer zones, with purposes, strategies and allowable uses.

Tenured Migrant Communities – group of persons who after the survey of the protected area occupants were verified to have been actually and continuously occupying a portion of the protected area for a period of at least five (5) years before the establishment of the same as such in accordance with the NIPAS Act and are solely dependent therein for subsistence. For the initial components of the NIPAS, the reckoning period of 5 years shall be June 1, 1992 and for additional sites for inclusion in the NIPAS, the reckoning period shall be from the issuance of the Presidential Proclamation establishing the site as a protected area.

Restoration – an activity which includes the planting of indigenous and/or endemic plant species in a specific area within the protected area or buffer zone with the objective of returning back as much as possible the original vegetation type.

offices/agencies, consistent with the Protected Area Management Plan and other relevant policies;

- 2.2.4 Formulate and implement an agreed equitable benefit-sharing schemes among its members;
- 2.2.5 Pay the required charges and other imposed resource use fees which shall accrue to the Integrated Protected Area Fund;
- 2.2.6 Enter into an agreement with government entities, private sector or civil society for developmental activities endorsed by the PAMB and consistent with the Protected Area Management Plan and the CRMP, and;
- 2.2.7 May execute an assignment, designation or allocation only among its individual members, families or groups thereof, who are likewise qualified tenured migrants under the Republic Act No. 7586. All such assignments, designation or allocation shall, however, be subject to this PACBRMA and must comply with all pertinent environmental laws, rules and regulations.

3. OTHER CONDITIONS

- 3.1 The DENR shall give exclusive rights to the PACBRMA Holder in obtaining the permit to extract, utilize and dispose any allowed non-timber forest products such as but not limited to rattan, bamboo, vine, fruit, and tannin and timber from trees planted by the Holders themselves that are found within PACBRMA area, other than those covered by the CRMP, subject to prior rights and existing laws, rules and regulations. Provided that no cutting of naturally-grown trees shall be allowed.
- 3.2 All rights, interests and activities of the PACBRMA Holder within the CBP areas shall be governed by the principles of biodiversity conservation and sustainable development.
- 3.3 All plans, policies and guidelines affecting the CBP areas subsequent to the signing of this Agreement shall be mutually developed by the contracting parties with the endorsement of PAMB.
- 3.4 In the event that the terms and conditions of the PACBRMA should be modified or this Agreement be rescinded in part or in whole, in the interest of the public, general welfare, biodiversity protection and sustainable development, the PACBRMA Holder shall be entitled to just compensation equivalent to the value of all improvements introduced therein such as plants, soil and water conservation measures provided, however, that there should be no fault and/or negligence on the part of either both parties. The affected participants shall then be entitled to harvest and/or remove such improvements consistent with existing policies.
- 3.5 (Provision for additional conditions, but must be consistent with the PAMP)

4. DURATION OF THE AGREEMENT

This Agreement shall have a term of twenty-five (25) years counted from the date this instrument is executed and notarized and be eligible for renewal thereafter for an additional twenty-five (25) years subject to the endorsement of the PAMB and upon compliance by the

This AGREEMENT made and entered into by and between:

The Department of Environment and Natural Resources, for and in behalf of the Republic of the Philippines, herein represented by its _____ with Office address at _____ and hereinafter referred to as the DENR;

- and -

The _____ herein represented by its Chairman/President, _____ with address at _____ and hereinafter referred to as the PACBRMA Holder.

WITNESSETH

WHEREAS, the DENR has the authority and jurisdiction over all protected areas in the country;

WHEREAS, the DENR promotes the conservation and sustainable development of biodiversity in protected areas and its buffer zones through sustainable development;

WHEREAS, the Community Based Program (CBP) shall be implemented in the sustainable-use zones, multiple-use zones, buffer zones or other appropriate zones of the _____ proclaimed under Presidential Proclamation No. _____/Republic Act No. _____ and consistent with the Protected Area Management Plan (PAMP);

WHEREAS, the CBP shall include the following components: (a) rehabilitation/restoration; (b) habitat protection; (c) conservation of resources; (d) development of alternative livelihood opportunities not necessarily dependent on forest resources; (e) sustainability of renewable resources being developed and utilized; and, (f) other activities that may be identified in the future and consistent with the Community Resource Management Plan (CRMP) of the area; and in conformity with the Initial Protected Area Plan, subject to revision upon approval of the General Management Plan of the concerned protected area;

WHEREAS, the Protected Area Community Based Resource Management Agreement (PACBRMA), in accordance with the provisions of Republic Act No. 7586, and DAO No. _____ is the tenure instrument to the (a) people's organizations whose members are qualified tenured migrants, and (b) interested indigenous people who opt to participate in the community based projects within protected areas;

WHEREAS, the Protected Area Management Board (PAMB) of _____ endorses the PACBRMA of _____ with attached specifications of the designated CBP area, through PAMB Resolution No. _____ dated _____

NOW THEREFORE, for and in consideration of the foregoing premises, the DENR shall allow the development and management of _____ in _____ situated in _____ Municipality of _____ Province of _____ with technical description and approved map which form an integral part of this PACBRMA No. _____ which is within the subject to valid and existing vested rights, existing laws, policies, rules and regulations and PAMP of the protected area, under the following terms and conditions:

This AGREEMENT made and entered into by and between:

The Department of Environment and Natural Resources, for and in behalf of the Republic of the Philippines, herein represented by its _____ with Office address at _____ and hereinafter referred to as the DENR;

and -

The _____ herein represented by its Chairman/President, _____ with address at _____ and hereinafter referred to as the PACBRMA Holder.

WITNESSETH

WHEREAS, the DENR has the authority and jurisdiction over all protected areas in the country;

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NOW THEREFORE, for and in consideration of the foregoing premises, the DENR shall allow the development and management of _____ in _____ situated in _____ Municipality of _____ Province of _____ with technical description and approved map which form an integral part of this PACBRMA No. _____ which is within the subject to valid and existing vested rights, existing laws, policies, rules and regulations and PAMP of the protected area, under the following terms and conditions:

offices/agencies, consistent with the Protected Area Management Plan and other relevant policies;

- 2.2.4 Formulate and implement an agreed equitable benefit-sharing scheme/s among its members;
- 2.2.5 Pay the required charges and other imposed resource use fees which shall accrue to the Integrated Protected Area Fund;
- 2.2.6 Enter into an agreement with government entities, private sector or civil society for developmental activities endorsed by the PAMB and consistent with the Protected Area Management Plan and the CRMP, and;
- 2.2.7 May execute an assignment, designation or allocation only among its individual members, families or groups, thereof, who are likewise qualified tenured migrants under the Republic Act No. 7586. All such assignments, designation or allocation shall, however, be subject to this PACBRMA and must comply with all pertinent environmental laws, rules and regulations.

3. OTHER CONDITIONS

- 3.1 The DENR shall give exclusive rights to the PACBRMA Holder in obtaining the permit to extract, utilize and dispose any allowed non-timber forest products such as but not limited to rattan, bamboo, vine, fruit, and tannin and timber from trees planted by the Holders themselves that are found within PACBRMA area, other than those covered by the CRMP, subject to prior rights and existing laws, rules and regulations. Provided that no cutting of naturally-grown trees shall be allowed.
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- 3.3 All plans, policies and guidelines affecting the CBP areas subsequent to the signing of this Agreement shall be mutually developed by the contracting parties with the endorsement of PAMB.
- 3.4 In the event that the terms and conditions of the PACBRMA should be modified or this Agreement be rescinded in part or in whole, in the interest of the public, general welfare, biodiversity protection and sustainable development, the PACBRMA Holder shall be entitled to just compensation equivalent to the value of all improvements introduced therein such as plants, soil and water conservation measures provided, however, that there should be no fault and/or negligence on the part of either both parties. The affected participants shall then be entitled to harvest and/or remove such improvements consistent with existing policies.
- 3.5 *(Provision for additional condition/s, but must be consistent with the PAMP)*

4. DURATION OF THE AGREEMENT

This Agreement shall have a term of twenty-five (25) years counted from the date this instrument is executed and notarized and be eligible for renewal thereafter for an additional twenty-five (25) years subject to the endorsement of the PAMB and upon compliance by the

Watershed - all areas proclaimed, designated or set aside, pursuant to a law, presidential decree, presidential proclamation or executive order as watershed before the effectivity of the NIPAS Act.

Section 3. Scope and Coverage. The Community-Based Program shall be established to provide opportunities to organized tenured migrant communities and interested indigenous peoples to manage, develop, utilize, conserve and protect the resources within the protected area and its buffer zone. The tenure instrument shall be issued only within multiple use, sustainable use and buffer zones. The organized tenured migrant communities may engage in protection and restoration activities in other allowable zones consistent with the PAMP.

Section 4. Creation of the PAMB-CBP Committee. The Protected Area Management Board (PAMB) shall create a PAMB-CBP Committee which shall handle all matters relating to the Community Based Program. The Committee shall be composed of the Regional Technical Director (RTD) for Protected Areas, Wildlife and Coastal Zone Management Service (PAWCZMS) of the DENR as chair, with members from the Local Government Unit/s concerned and selected PAMB members. They shall be appointed by the Regional Executive Director (RED) concerned.

Section 5. Stages of the CBP implementation. There are four stages in the establishment and management of a Community-Based Program in Protected Areas. They are the: (1) preparatory stage; (2) People's Organization formation and provision of security of tenure; (3) planning stage; and, (4) implementation stage.

5.1. The Preparatory Stage. It involves generating awareness for the program, forming a strategic collaboration of all sectors concerned and identification of the CBP areas.

5.1.1. Information, Education and Communication Campaign (IEC). The RTD for PAWCZMS, as lead, Community Environment and Natural Resources Officer (CENRO) and Protected Area Superintendent (PASu) shall conduct IEC to inform, educate and acquire support from sectors concerned on the CBP. They shall undertake a continuing systematic orientation of the local communities, local government units, local units of relevant government agencies, civil society organizations and financing institutions on CBP matters.

5.1.2. Institutional Linkages. The RTD for PAWCZMS, as lead, CENRO and PASu shall promote the active participation of various agencies and organizations to meet the objectives of the CBP. They shall give high priority in establishing and forming partnerships among agencies and organizations, both public and private.

5.1.3. Identification of CBP Areas. The PAMB with the PASu shall identify CBP areas within the allowable zones of the protected area and buffer zone using as bases the results of the Survey and Registration of Protected Area Occupants (SRPAO), Resource Based Inventory (RBI) and Protected Area Management Plan

5.2.3. Application, processing, and approval of the PACBRMA. The PO shall submit its application for a PACBRMA to the PASu. The following requirements shall be submitted:

- a. Accomplished application form;
- b. Certificate of Registration of the PO;
- c. List of officers or in the case of indigenous people, list of council of elders or other similar indigenous governing body in the area;
- d. List of members, including address and complete name of spouse, if any, and certified by PAMB as qualified tenured migrants; and;
- e. Resolution from the members of the PO allowing its president or head to file the PACBRMA application or in the case of indigenous peoples, proof of consent from the council of elders or other similar indigenous governing body of their interest to apply for the PACBRMA.

PAWB shall prepare and disseminate to the RED the prescribed format of the requirements for the PACBRMA application, five (5) working days after the approval of this Order.

Upon submission of the requirements, the PASu shall fully explain to the PO the provisions of the PACBRMA. He/she shall review the application and other requirements and endorse them to the PAMB within fifteen (15) working days upon receipt hereof. Within thirty (30) working days upon receipt of the PACBRMA application, the PAMB through the CBP Committee, shall convene and discuss with the PO the terms and conditions of the Agreement and through a resolution, endorse the same to the RED.

5.2.4. Approving authority. The RED shall complete the review of the PACBRMA application endorsed by the CBP Committee within three (3) working days upon receipt hereof. If found meritorious he/she shall approve the application with the area not exceeding 15,000 hectares. The RED shall endorse to the Secretary through Protected Areas and Wildlife Bureau (PAWB) the PACBRMA application with more than 15,000 hectares.

For control purposes, the PACBRMA shall be numbered as follows: Region - Acronym of the protected area - Year of Issuance - Agreement Number. The numbering should be continuous with the protected area concerned.

5.3 The Planning Stage. After the issuance of the PACBRMA, the PO (PACBRMA Holder) shall prepare the CRMP. The CRMP shall describe the PO's long term vision, aspirations, commitments and strategies for protection, rehabilitation, development and sustainable utilization of the resources within the protected area.

5.3.1 Preparation of the CRMP. The PASu and CENRO shall assist the PO (PACBRMA holder) in the preparation of the CRMP. The CRMP shall be consistent with the PAMP and other relevant policies, rules and regulations.

In case the CRMP includes resource extraction, a 5-year plan of activities shall be prepared. The indigenous peoples have the option to prepare an Ancestral Domain Sustainable Development and Protection Plan (ADSDPP) in lieu of the CRMP.

The PAWB shall prepare the procedure on the preparation of the CRMP within thirty (30) working days from the effectivity of this Order.

5.3.2 Affirmation of CRMP. The PAMB shall endorse the CRMP to the RED for affirmation. The affirmation shall confirm that it has been prepared in a participatory manner, active participation of the DENR, and, approval of the plan.

5.4 Implementation Stage. This stage shall implement the CRMP and the 5-year plan of activities; enhance organizational and institutional capacities; ensure economic viability of resource management activities; ensure the flow and equitable benefits to PO members; ensure the build-up of capital by the PO for sustainability.

Section 6. Community-Based Forest Management Agreements (CBFMAs) Issued in Protected Areas. For proclaimed watersheds and mangrove reserves with CBFMAs, their implementation shall continue. Provided, that the resource utilization shall conform with the Protected Area Management Plan (PAMP).

The RED through the RTD for PAWCZMS shall take the lead in the monitoring of the implementation of such CBFMAs and the provision of technical assistance, in close coordination with the Forestry Management Service. Moreover, he/she shall inventory all existing Protected Areas-Community Based Forest Management Program activities and determine their status.

Section 7. Monitoring and Evaluation. The PAMB, through the PASu and in coordination with the CENRO concerned, shall monitor the compliance of the terms and conditions of the PACBRMA. The PASu shall submit biannual reports to the Regional Office on the CBP implementation in the protected area.

The Regional Office, through the RTD for PAWCZMS, shall undertake periodic monitoring and evaluation in the implementation of the CBP in protected areas within its jurisdiction. The RED shall submit biannual report to the Secretary, through PAWB, on the implementation of the Program.

The PAWB shall monitor and evaluate the national CBP implementation of the DENR to identify issues and lessons learned; draft policies, guidelines and procedures on CBP; and, develop and maintain Program database.

Section 8. Termination or Cancellation of the PACBRMA. The grounds for termination or cancellation of the Agreement shall be as follows:

- a) Neglect or violation of the terms and conditions of the Agreement, after being notified in writing within one (1) month by the RED on behalf of the PAMB;
- b) Violation of environment and natural resources laws, rules and regulations;
- c) Conversion of the CBP area or portions thereof, to other uses not authorized in the Protected Area Management Plan; and,
- d) When the national interest so requires as determined by the DENR Secretary.

The RED shall constitute an investigation team to be chaired by the RTD for PAWCZMS for the purpose. During the investigation of any of the aforementioned grounds, the RED may suspend the Agreement.


In case a PACBRMA has been nullified, all improvements and development in the area shall be turned-over to the PAMB.

Section 9. Fund Allocation. The DENR shall allocate the necessary fund for the implementation of this Order. All fees to be collected by the DENR from the CBP implementation shall accrue to the Integrated Protected Area Fund.

Section 10. Separability Clause. If any part or section of this Order is held invalid, all other provisions, parts or sections not affected thereby shall remain in force.

Section 11. Repealing Clause. This Administrative Order modifies DAO No. 96-29 or the Implementing Rules and Regulations of Executive Order No. 263 in so far as protected areas are concerned and repeals DAO No. 2000-44 and DAO 2002-02. All other orders, memoranda and circulars which are inconsistent herewith are likewise revoked or amended accordingly.

Section 12. Effectivity. This Order shall take effect immediately after its publication in a national newspaper of general circulation.


ELISEA G. GOZUN
Secretary

PUBLISHED: MALAYA
SEPTEMBER 10, 2024

Appendix 9. Selected indicators for monitoring project impacts to communities

The selected and prioritized indicators to lay down parameters for eventual evaluation of project impacts on the community will be initiated at two levels:

(a) Community wide or the barangay level to compare across the five project sites:

- Socio-demographic status
 - Net migration rate and trends: in-migration, out-migration, circulation in natural resource use areas or dense urban sites
 - No. of households with built unit less than five years (proxy variable for in-migration)
- Status and access to basic services
 - Completion of secondary education
 - Quality of educational services and facilities (related to environmental quality)
 - Population-to-barangay health station ratio/ population-to-health workers ratio
 - No. of households with access to safe drinking water
 - No. of households with own sanitary toilet
 - Waste and drainage system
- Livelihood engagements
 - Employment by source and income
 - Population engaged in livelihood activity
 - Kinds of natural resource used/collected
- Ecogovernance
 - Types of tenurial instrument/ resource-use permits
 - Inclusion & implementation of reforestation plans and ordinances
 - Change in practices and values to counter destructive resource use :
 - reliance on illegal logging
 - use of fuelwood and charcoal from natural forest

(b) Household level differentiating Family Participants (FP) and non-participants (NP) as comparison group.

Net economic benefits include (1) increase in income from (a) incentives for successful establishment and ensured growth of seedlings in reforestation and enhancement planting, and (b) benefit sharing from harvest of fruit trees in agro-forestry; (2) free seedlings as well as training in various techniques in forest establishment and management (SALT, soil and water conservation, mulching, pest control, and marketing), and (3) positive changes in environmental values, attitudes, and practices. These net economic and social benefits will stabilize agriculture as primary livelihood of upland communities, while regulating the use of forest resources for local needs and supplemental income.

Appendix 10. List of indigenous species collected by the community as wildlings within and adjacent forest of the project site for reforestation.

No.	Local Name	Common Name	Family	Scientific Name
1	Alem	Alim	Euphorbiaceae	<i>Melanolepis multiglandulosa</i>
2		Alibangbang	Leguminosae	<i>Bauhinia malabarica</i>
3	Ani	Dapdap	Leguminosae	<i>Erythrina orientalis</i>
4	Annang	Anabiong	Ulmaceae	<i>Trema orientalis</i>
5		Antipolo	Moraceae	<i>Artocarpus blancoi</i>
6		Anubing	Moraceae	<i>Artocarpus ovatus</i>
7		Bagalunga	Meliaceae	<i>Melia azidarach</i>
8		Balete	Moraceae	<i>Ficus spp.</i>
9	Balingatta	Bolong eta	Ebenaceae	<i>Diospyros pilosanthera</i>
10		Balinghasai	Anacardiaceae	<i>Buchanania arborescens</i>
11		Balobo	Tiliaceae	<i>Diplodiscus paniculatus</i>
12		Banaba	Lythraceae	<i>Lagerstroemia speciosa</i>
13	Bulala	Bangkal	Rubiaceae	<i>Nauclea orientalis</i>
14		Batino	Apocynaceae	<i>Alstonia macrophylla</i>
15		Bayok	Sterculiaceae	<i>Pterospermum diversifolium</i>
16		Bignai	Euphorbiaceae	<i>Antidesmas bunius</i>
17	Samak	Binunga	Euphorbiaceae	<i>Macaranga tanarius</i>
18	Camarag	Dao	Anacardiaceae	<i>Dracontomelon dao</i>
19	Dayag			<i>Aglaia sp</i>
20		Dita	Apocynaceae	<i>Alstonia scholaris</i>
21		Dungon	Sterculiaceae	<i>Heritiera sylvatica</i>
22				
23		Hagimit	Moraceae	<i>Ficus minahassae</i>
24		Hauili	Moraceae	<i>Ficus septica</i>
25	Malibabag	Himbabao	Moraceae	<i>Broussonetia luzonica</i>
26		Ipil	Leguminosae	<i>Intsia bijuga</i>
27	Balangiking	Kalios	Moraceae	<i>Streblus asper</i>
28	Kalusit	Kalumpit	Combretaceae	<i>Terminalia citrine</i>
29	Mabolo	Kamagong	Ebenaceae	<i>Diospyros blancoi</i>
30	Kamiring	Ligas	Anacardiaceae	<i>Semecarpus cuneiformis</i>
31		Malawisak		<i>Neonuclea reticulate</i>
32		Maranangka	Rubiaceae	
33	Marannyog	Niog-niogan	Moraceae	<i>Ficus pseudopalma</i>
34	Ammawan	Molave	Verbenaceae	<i>Vitex parviflora</i>
35	Antahan	Narra	Leguminosae	<i>Pterocarpus indicus</i>
36		Sablut	Lauraceae	<i>Litsea glutinosa</i>
37		Salisi	Moraceae	<i>Ficus benjamina</i>
38		Takip Asin	Euphorbiaceae	<i>Macaranga grandifolia</i>
39		Talisai	Combretaceae	<i>Terminalia catappa</i>
40	Tabbag	Tibig	Moraceae	<i>Ficus nota</i>
41	Magalayaw	Tindalo	Leguminosae	<i>Azelia rhomboidea</i>
42	Tweg	Tuai	Euphorbiaceae	<i>Bischofia javanica</i>
43	Marasantol**			
44	Marattit**			
45	Marabayabas**			
46	Maradalayap**			

No.	Local Name	Common Name	Family	Scientific Name
47	Maradapdap**			
48	Maraddan**			
49	Maralumboy**			
50	Pangut**			
51	Gonsesirit**			
52	Carasakat**			
53	Gilak**			
54	Dallak**			
55	Larag**			

** Scientific name of species is currently being verified

REFORESTATION MANUAL OF OPERATIONS

PHILIPPINE PEÑABLANCA SUSTAINABLE REFORESTATION PROJECT (PPSRP)

Peñablanca Protected Landscape and Seascape (PPLS) Peñablanca, Cagayan

Version: December 5, 2009

DENR manual for reforestation activities is the bases for the project's manual for operations. In case further details are necessary than the following guideline, which has been taken from the DENR guideline for the issues most relevant to the project, please consult the DENR guideline or seek clarification and instruction from Protected Area Superintendent. The project has developed some improvement in operations through the experience of actual implementation. Such improvements have been incorporated into the instructions below. This manual will be updated periodically as project proceeds.

1. NURSERY OPERATIONS

1.1. Site selections and agreements

The nursery is where young plants are being raised and taken care of until they reach the right size for out planting. It also provides enough supply when the need arises which is more economical than procuring them from commercial sources. The production of planting materials requires a nursery to protect them from natural destructive elements such as typhoons, floods, or droughts. Seedlings in the nursery/the whole nursery must be also protected against roaming astray animals and insect pests to ensure their safety and quality.

The following are the criteria in selecting an ideal nursery site:

- a. Close to water sources (rivers, creeks, springs, lakes, etc.) that could supply enough water for the seedlings in the nursery throughout the year round
- b. Plain to moderately sloping areas
- c. With available source of good soil for potting

- d. Strategically/centrally located to the plating site/service area to minimize damage of seedlings during hauling and minimize transport cost
- e. Area should be large enough to accommodate the target seedlings and facilities
- f. Area must have good exposure to sunlight especially during hardening off. Some seedlings also needs enough sunlight
- g. The area for the nursery should be in protected/safe area against the impact of typhoon (flooding/wind/falling trees). Preferably, in between ridges.
- h. The site should be accessible by vehicle, cart or can be reach by horses or with access trail to facilitate easier hauling of seedlings
- i. The site should be free of conflict to avoid anticipated problem in the future
- j. Near built up areas or residential is more advantage for protection advantage
- k. If the selected site is within ISF/CSC's, the CSC holder should be the priority to be the nursery caretaker if needed. There should be a separate agreement between the project and the CSC holder if the project decides to give rentals to the CSC holders (this in when the selected site for the nursery is previously giving benefits to the CSC holder/s of previously being cultivated

1.2. Proper Design and Make Up

- a. Nursery house/ bunkhouse office- containing rooms for seed storage, tools, computers and other project documents. This infrastructure will also serve as staff quarters and working space (this requirement is for main nurseries only)
- b. Potting shed - is a temporary open-sided shade for mixing and storing potting media and filling of plastic bags and other containers
- c. Germination shed- is an enclosed structure for protection and with windows for adequate ventilation, and waist-high benches for germination trays. In some cases, this could be part /extension of the bunkhouse.
- d. Seed beds/ germination beds – these beds will be constructed one (1) meter wide with about 0.6 meter pathway between them.
- e. Pot beds- are one (1) meter wide and from 5 to 10 meters long, with one (1) meter-wide pathway to do weeding, watering and transporting of seedlings. Elevated beds are recommended to minimize flooding.

- f. Hardening area- place where seedlings are being stationed about a month before they will be dispatched for outplanting
- g. Composting area- a place set aside to dump daily organic waste which can later be used as an economical natural fertilizer. A practical compost area size is 1 x 1.5 x 4 meters made of hollow blocks with removable boards in front
- h. Water system- is essential to ensure that the seedlings will be getting enough supply of water while in the nursery specially during dry season
- i. Perimeter fence- made up of barb wires surrounding the nursery for security against astray animals and lost of seedlings especially fruit trees due theft
- j. Drainage- must be constructed in the nursery to avoid flooding of seedlings during heavy rains or typhoon.

1.3. Sources of Seeds

- a. Collect seeds from the local source whenever possible and/or in areas with the same climatic condition as the planting site must be observed
- b. Collect from areas with no record of diseases

1.4. Seed collection

Below are ways of fruits/seeds from selection from the selected mother trees:

a. Collection from the ground

- This practice is common for trees with fruits that fall in to the ground upon maturity
- Gather fruits and seeds right after they have fallen to avoid the risk of collecting immature, decayed and/or germinated seeds. Collect fruits that fall during the peak of the fruiting season to ensure higher viability of the seeds. Note that seeds from fruits collected during the initial, and towards the end of the fruiting season are usually inferior.

b. Collection from standing trees

- Gather fruits/seeds from standing trees by climbing trees either with a safety belt or with the aid of a rope tied on the bare feet. Ladders can also be used to pick the fruits/seeds. Tree climbing is necessary for tall trees with small seeds.

c. Collection by shaking branches

- Another way of collection is by *shaking* the branches of the tree either manually or with the aid of a rope tied at the tip of the branches.

Other factors to consider:

- Collect seeds from fallen fruits or pods before they begin to open and/or germinate.
- Collect the seeds during the tree's regular fruiting season. Collection at the beginning and end of fruiting season is not advisable.

1.5. Seed processing

Process the seeds properly to avoid damage and attain high percentage germination. Extract the seeds from the collected fruits and immediately dry them for easier storage and transport. Sun or air dry the seeds to save them from fungal and micro-organism infection and insect attack.

In addition, separate the seeds from impurities through any of the following methods:

- a. Flootation - Submerge the seeds in water. Seeds that float are empty and therefore will not germinate.
- b. Winnowing or Blowing - Expose the seeds to wind. Those seeds that are carried by air will not germinate, thus are useless.
- c. Screening or Sieving - Sieve the seeds by shaking or rubbing through a screen until all impurities are removed.
- d. Sorting - Sorting separates the defective from the good seeds. This is applicable mostly to bigger-sized seeds.

1.6. Wildling collection

Wildlings- a young plant of any size, having a woody or succulent stem, originating and growing naturally in the wild

The collection of wildlings in for any habitat restoration/rehabilitation programs or project must be subject to the following:

a. Identification of mother trees

- Mother trees as sources of the seedlings/wildlings shall be identified and marked following sustainable practices and ensuring that these trees shall be protected;

b. Timing of collection

- Wildlings collection must only be done during the time the soil in the target collection site is still wet, or gathering must be only done during rainy days to avoid damage to the roots of wildlings and mortalities.
- In some cases that there are good wildlings but the soil is not wet, watering the collection area must be done.

c. Where to collect and where not to collect

- The collection must be only done in the site with intact vegetation
- Collection of wildlings near the edges of secondary forest must not be allowed to allow natural regeneration to the neighboring grassland/open areas
- Collect only wildlings in the high density areas
- Do not collect in critical areas like sites prone to landslide or previously eroded areas
- Maximum range of wildling collection is from about 10-20 meters away from the canopy of the mother trees. In this range, we expect plenty of regenerations (wildlings/saplings/poles) and collection of wildlings will not contribute risk of lowering the required density per unit area of the forest.

d. Who can collect (they should possess the following criteria)

- Project participants / non participant who are bonafied residents within the project covered barangays
- He /she must attend orientation on wildling collection given by the project staff through meeting, group or one-on-one discussion
- Forest resources dependent families

e. Species to be collected and desired number and sizes of wildlings to be collected

- Collection of wildlings is only focus on indigenous species. List of indigenous species that could be collected is shown in attached Table 1. This in consonance to DENR Memorandum Circular 2004-06 entitled: “Guidelines in the Integration of Rain forestation farming strategy in the development of open and denuded areas within the protected areas and other appropriate forest lands”. Only the native and endemic species in the site will be promoted as the planting material to bring the original forest and attract lost wildlife and plant biodiversity in the site
- The number of wildlings to be left behind in the collection area must be:
 - a. For sun loving prolific indigenous tree species like Tuia, narra, dapidap, ligo, alahan and others, 10-20 intensity scattered per square meter is enough to left behind under the canopy of the mother trees. Only few because as observe in the field, wildlings of such species just have very minimal percentage to survive under the shade of the mother tree. In this case, much better to collect those crowded wildlings and transfer them in the desired planting area.
 - b. For some wind dispersed fruit/seed trees, collection of wildlings away from the mother tree is just allowed at maximum distance of 20 meters away from the outer most canopy of the mother tree. In between this range, there are still many wildlings being observed. Just maintained about 10 good quality wildlings to include other species of trees scattered per square meter. This includes the possible mortalities.
- In general, the preferred sizes of wildlings that could be collected ranges from 10-40 cm. Table below shows some indigenous species in the project area/zone with their preferred sizes for wildlings for collection.

Common Name	Scientific Name	Allowable size to be collected in cm
Alibangbang	<i>Bauhinia malabarica</i>	15- 30
Alim	<i>Melanolepis multiglandulosa</i>	15- 30
Antipolo	<i>Artocarpus blancoi</i>	30-40
Bangkal	<i>Nauclea orientalis</i>	20-30
Bangkoro	<i>Morinda citrifolia</i>	15-30
Bignay	<i>Antidesmas bunius</i>	15- 30
Binunga	<i>Macaranga tanarius</i>	15-30

Dapdap	<i>Erythrina orientalis</i>	15- 30
Hawili	<i>Ficus septica</i>	15- 30
Kalumpit	<i>Terminalia microcarpa</i>	15- 30
Kamagong	<i>Diospyros blancoi</i>	10-20
Marapapaya	<i>Polyscias nodosa</i>	30- 40
Molave	<i>Vitex parviflora</i>	30- 40
Narra	<i>Pterocarpus indicus</i>	20- 40
Niog-niogan	<i>Ficus pseudopalma</i>	15- 30
Takip- asin	<i>Macaranga grandifolia</i>	30- 40
Tibig	<i>Ficus nota</i>	30- 40
Tindalo	<i>Azelia rhomboidea</i>	30- 40
Tuai	<i>Bischofia javanicat</i>	15- 30
Wild Santol	<i>Sandoricum vidalii</i>	15- 30

f. Process of collection

- Wildlings must not be directly uprooted from the ground
- Gather the wildlings by simply lifting them with the aid of a bolo or shovel to minimize damage



- For those species with more than enough roots, it could be reduce or trimmed using sharp bolo, scissor or knife
- Trimming of leaves for the collected wildlings especially those broad leaf species is highly recommended to balance water intake and transpiration (during travel and during stay in the nursery when the roots are not well established)



- Collect wildlings early in the morning or late in the afternoon to prevent wilting and minimize mortality (if temperature is high). Collected wildlings must be brought immediately to the nursery or in the potting area
- Wrap the roots collected wildlings (individual if the wildling is big enough or in bunch for smaller wildlings) with wet/ moistured soil or banana sheath or a plastic bag with holes. Technically, they call it mud paddling.



- Transport the collected wildlings when the environment temperature is not too warm to prevent rapid wilting of the wildlings
- Plant immediately the collected wildlings in the prepared pots. In case that the wildlings can not be potted immediately after collection, the wildlings must be temporarily stored or placed in a wet muddy soil to allow the roots to absorb water

g. Payment of propagated wildlings

- Under PPSRP, for every plantable planting stock (either 40 cm height from root collar to tip or 1.0 cm base diameter and have at least 5 healthy leaves) produced in the backyard nursery of project participants, they will be paid for Php 4.00 per delivered seedlings at the project nursery provided that they will be the ones to procure/produce the polyethylene bags. For those who can not afford to buy polyethylene bags, the project will provide them but the delivery price will then become P3.50/ planting stock wherein the P.50 deduction is the cost of the polyethylene bag. On the other hand, for every plantable planting stock to be produced inside the project nurseries, the seedling producer will be paid P2.70/ planting stock instead of P4.00 because the project will deduct the labor payment for potting, collection /mixing potting media and cost of polyethylene bag. Before any payment will be made, the field staff assigned for seedling production and nursery operations will validate the seedlings to confirm that they have reached the minimum quality standards for plantable seedlings before the seedlings will be delivered to the nurseries.

1.7. Sowing of seeds / seed germination

a. Methods of sowing

- Species with very small or fine seeds (less than 1 cm in diameter) should be sown only in seed boxes. Cover the seeds with fine sand, just enough to ensure surface cover.
- Large seeds (more than 1 cm in diameter) are either sown in seedbeds or directly in plastic bags and other containers. Examples of these are Ipil (*Intsia bijuga*), Narra (*Pterocarpus indicus*), Talisay (*Terminalia catappa*), and among other species. Simply press the seeds into the soil until they are half covered.

b. Treatment before germination

Seeds with hard coats require some treatments for faster and uniform germination. These include any of the following:

- breaking of hard seed coats
- cold water soak
- hot water soak
- alternate hot and cold water soak
- dry heat treatment

- c. Soil mixture/potting media for seed germination - The preferred sowing materials or germination soil mix consist of 50% sieved washed river sand and 50% top garden soil.
- d. Watering - Water the seed beds twice a day during the dry season or water as often as necessary to keep the soil moist but avoid excessive watering.



- e. Germination - When the seed starts to sprout, germination is taking place. Generally, germination occurs from 3 days to 2 weeks after sowing. However, some seeds germinate longer, depending on species.

1.8. Potting soil preparation

a. Soil mixture

Most pot plants will grow adequately in the standard potting soil or potting mix that is available from nurseries. It is important to have the best quality potting soil as the pot plant will derive much of its nourishment from this potting mix for a long time and its health will depend on the quality of the potting soil used. The potting soil should be of the right texture for optimum root development. It should contain all the essential nutrients required for plant growth and should be able to hold enough water to sustain the pot plant over a number of days. It should also have adequate drainage.

The following are suggested mixture of potting media:

- Seven parts or 50 % (by volume) of good garden loam soil for nutrients
+ Organic Fertilizer (about 1 part every 7 parts of good garden soil)

- Three parts or 22 % (by volume) of sieved, well-decomposed compost or peat moss for moisture retention and nutrients.
- Two parts or 14 % (by volume) of well-rotted manure for nutrients.
- Two parts or 14 % (by volume) of river sand for drainage.

b. Potting bags

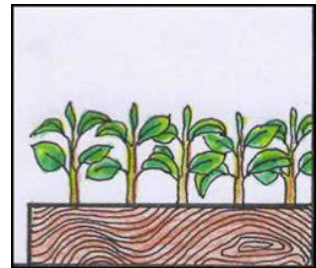
- The standard size for the potting bags for the indigenous species is 2”x2”x6” black polyethylene bags for forest tree species. We are using this standard size of polyethylene bag to make the bags intact after a year since many of the indigenous will be just plantable for after almost a year.

1.9. **Pricking of seedlings** (applicable for small seeds that are germinated in seed boxes or seedbeds. Large seeds can be directly sown in soil-filled plastic bags)

Transfer the seedlings from the seed boxes or seedbeds to plastic bags or other containers. This will provide them with adequate space to grow and develop. In transplanting the seedlings, consider the following:

- a. Prick early in the morning or in the afternoon to prevent the seedling from drying but it can also be done aside from the above mentioned time when the weather is cloudy.

- b. Transfer the seedlings from the seed boxes or seedbeds when the second pair of leaves has fully developed.



- c. Before pricking, soften the soil in the seed boxes by sprinkling or misting and potted soil for transplanting must be available and inventoried to determine the number of seedlings to be pricked.

- d. Lift the seedlings with the aid of sharpened pricking stick or trowel only when they are



already firm and the soil is moist to avoid root damage.

1.10. Planting of pricked seedlings and/or sowing seeds into soil-filled plastic bags

- a. Put 10 grams (about 1 teaspoon) of mycorrhiza at about 1” (inch) below the top edge of soil-filled plastic bag and cover it with top soil. Mycorrhiza helps seedlings absorb soil nutrients
- b. Dig a hole (about 2” deep) with a pointed thumb-size stick in the soil-filled plastic bags.
- c. Place the pricked seedlings into the hole carefully or sow the seeds directly into the hole. For direct sowing, depth of hole will depend on size of seeds, fine seeds must not sowed too deep and for large seeds shall not too shallow.
- d. Cover the holes with fertile fine soil and lightly press it.
- e. Place and arrange in rows of potted seedlings in the pot beds
- f. Potbeds should be:
 - flattened / labeled surface
 - place a potbeds guards made up of bamboo splits
 - place mulching plastic then covered with rice hull to prevent growing of grasses at the bottom of pots; for water don’t easily penetrate to the soil; to prevent penetration of the seedling roots directly to the soil in the pot beds
 - Potbeds should be at least one (1) meter wide and from 5 to 10 meters long, with one (1) meter-wide pathway to make weeding, manual watering, and transporting seedlings easier. Elevated beds are recommended in areas that are flooded easily.
- g. Water the seedlings immediately after transplanting.
- h. Keep seedlings shaded for sometime until they have established themselves.
- i. Set aside poorly developed seedlings for treatment to improve their quality, but discard infected ones.

1.11. Nursery and seedlings Care & Maintenance

- a. In general, watering twice a day, preferably early in the morning and late in the afternoon, is enough. However, it also depends on the seedling size and stage of development. Small seedlings past the germination stage need

small quantities of water at frequent intervals. Larger seedlings need more water. Over-watering lessens essential nutrients. It also increases fungal and bacterial attack. In addition, excessive watering results in tender, overgrown, succulent plants, sometimes of a yellowish color. Insufficient watering causes wilting and stunted growth of seedlings.

- b. Weeding is done manually to enable the seedlings to have more soil nutrients, moisture, light and space. Any weeds among the seedlings should be removed carefully to avoid disturbance to the roots.
- c. Shading protects young seedlings from damages caused by direct sunlight. Use coconut or banana sheaths, cogon, and other locally available materials as temporary shades during and shortly after germination and after transplanting. Thereafter, gradually remove the shade until they have all the light they can tolerate without harm.
- d. Root pruning- is the cutting of roots that grow out of the pots or containers to have quality and uniform seedling sizes. This will also facilitate transport to the planting field. Lift the pot (shocking) regularly and cut root outgrowth using pruning shears.



- e. Fertilizers supplement- the essential nutrient requirements of the growing seedlings that are not provided by the potting mix. Apply foliar soluble fertilizers every fifteen (15) days or if needed
- f. Nursery pests and diseases- greatly affect the quantity and quality of seedlings. Without appropriate preventive/control measures, they can cause indirect losses. These losses disrupt planting schedules or reduce survival of outplanted stock. Some examples of nursery pests are jumping lice, grubs, shoot borers, leafhoppers, and defoliators. Some plant diseases are dumping off, leaf spot, root/leaf/stem rot, needle blight, gall rust, and wilting. The risk of insect pests and diseases can be greatly reduced through the following nursery hygiene:
 - sterilize all potting materials
 - disinfect all nursery equipment and the general working area regularly
 - bring/take into the nursery only plant materials that are free from diseases and insect pests
 - monitor the occurrence of any insect pest or disease constantly

1.12. Hardening off

Hardening-off is the final stage of nursery care of the seedlings. This prepares them for the prevailing environmental conditions in the planting area. Hardening off is done through the following activities:

- a. Transfer grown up seedlings to a hardening area to acclimatize them under adverse condition (seedlings must make transition from optimal growth and survival conditions of nursery to actual, competitive conditions of the field)
- b. Reduce watering and shading gradually
- c. Prune all the protruding roots a month before outplanting
- d. For over-sized seedlings, trim the leaves to at least 1/3 of their size to avoid excessive loss of water.
- e. After one (1) to one-and-a-half months in the hardening area, the seedlings are ready for outplanting
- f. Do not apply fertilizer while hardening seedlings

1.13. Plantable Seedling Criteria/ seedlings ready for outplanting

Minimum requirements for planting materials before they will release for out planting in the field are:

- a. The seedlings have been hardened or exposed to the sun for about a month, shocked, root pruned and frequency of watering was reduced
- b. The seedlings must have a minimum of about cigarette/ 1cm base diameter or at least 40 cm in height (from root collar to shoot)
- c. The seedlings must be free from diseases before transporting to planting site

1.14. Seedlings and nursery monitoring

- a. Assigned nursery aide per nursery to do regular watering, protection and other necessary activities
- b. Aside from the nursery aide, the project should assign project staff to do regular technical monitoring of all ongoing nursery activities
- c. Nursery visits are being conducted on a regular basis. This is being done to ensure that all scheduled activities specially the seedlings care and maintenance activities are being conducted accordingly. With the supervision of the assigned project staff, the nursery aids conducts the

nursery routine activities together with the daily hired nursery laborers. Among the nursery routines being conducted in each nursery includes:

- Root pruning
- Leaf pruning
- Watering
- Hardening
- Weeding
- Foliar fertilizer applications
- Insecticide applications
- Sorting
- Inventory of remaining seedling stocks; and
- Release of seedlings for new planting and replanting activities

d. All nursery aids are required to report to the assigned project staff about their planned activities for each week. They are also required to report/submit reports to the project staff in case of any untoward incidents that occurred within their areas of responsibilities related to the nursery operations. Cell phone number of the assigned project staff was also disseminated to all nursery aids for speedy communication process. For nursery aids located in nursery sites without cell phone signal, the nursery aid should report to the in-charge staff regularly for updates. Every Monday, all nursery aids are required to report to the project staff for:

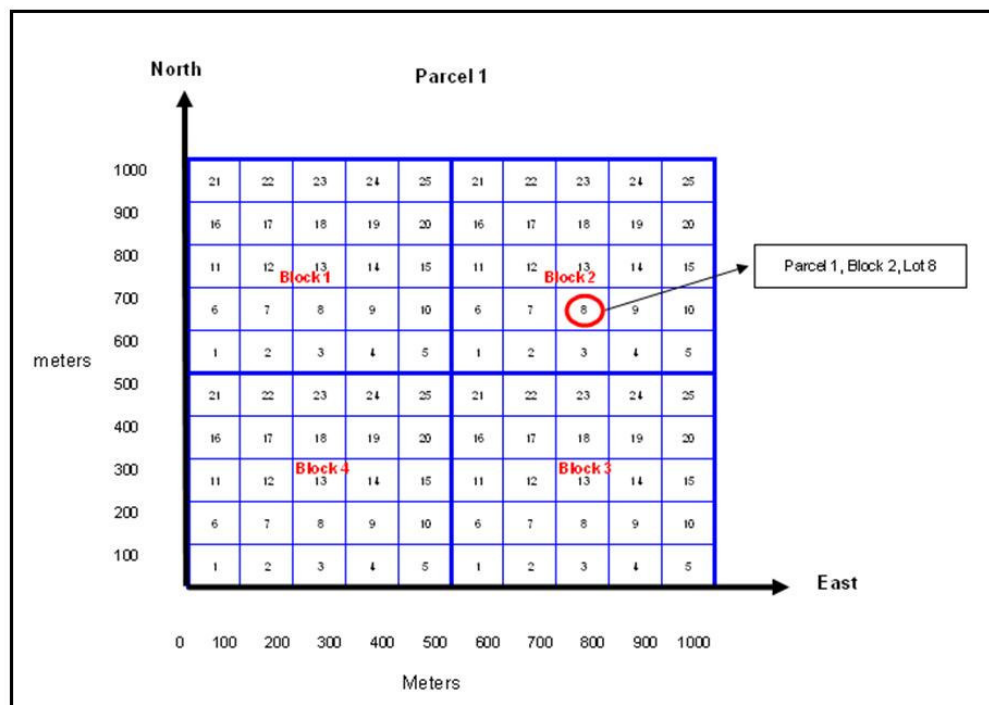
- Sharing of latest project- related project updates;
- Scheduling of immediate nursery- related activities which are not included in the weekly plan of activities;
- Submission of all documents (daily attendance sheets, seedlings release forms, seedlings inventory results, etc.) for payroll processing;
- Reporting of planned activity of the nursery aids for the following week;
- Reporting of any untoward incidents that occurred within their respective areas of responsibilities; and
- Payroll disbursements.

2. PLANTING SITE PREPARATION

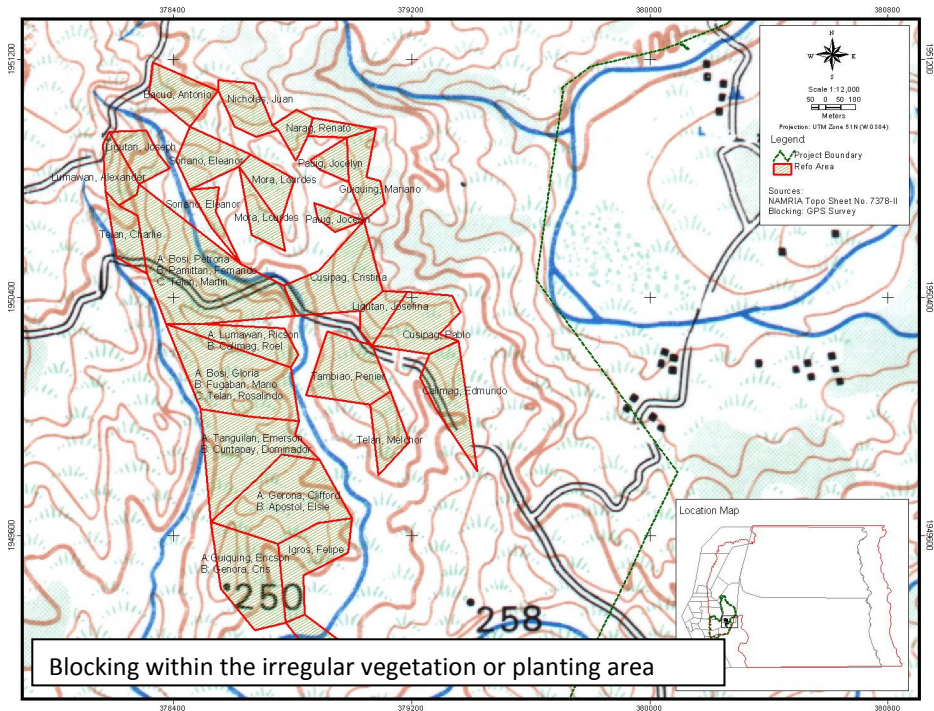
2.1. Blocking

Two to three months before the rainy season or planting season, target areas to be planted will be identified, surveyed and blocked by the project technical staff. For big grassland areas, the approach of blocking is compartmentalized about 100 hectares for 1 parcel that to be subdivided into 4 blocks containing 25 hectares per block. The area will be delineated using Global Positioning system (GPS) device, 100m tape/chain and compass.

The process of blocking is to establish 1,000 meters due north starting at a known point (PPLS corner / PPSRP corner) as a baseline. Every 100 meters distance will be marked with a 2-meter pole and paint with white color. From the baselines, every 100 meter will be marked and from there, a 1,000 meter perpendicular to the baseline will be run in due East direction in every 100 meters following the baseline.



In some areas of the project with irregular areas for planting for reforestation or in patches in between brush land or secondary forest, blocking will be done by reading GPS coordinates of every corner of open patches regardless of how many hectares a patches have.



All GPS reading regarding blocking will be will be reflected into the map as reference during lot distribution to project beneficiaries and project monitoring.

2.2. Lot distribution to reforestation participants

As objective of the project to reduce the impact of forest base related activities of the people from the project Barangays and neighboring Barangays, set of criteria were develop to go with the project objectives to divert the destructive activities of the people to more productive works. The project aims high involvement of the communities not only to agroforestry but also under reforestation components. For a family/individual to be included as potential reforestation participants, he/she have the following criteria:

- a. Must be a tenured migrant/resident of the project covered Barangays
- b. Willing to enter into a MOA under reforestation component of the PPSRP
- c. Identified by the Barangays council as forest dependent family either commercial charcoal maker, fuel wood collectors , upland farmer
- d. Below average income

- e. Physically fit to do the reforestation work/activities himself (not solely by hired labor)

Before the final lot distribution, Meetings should be conducted in coordination with the Barangay official inviting all interested participants to participate under reforestation planting. After the meeting, expected possible scenarios that will come up were the ff;

- 1st : potential participants is more than the target area
- 2nd : Number of interested potential participants is just enough for the target area
- 3rd : Number of potential participants is not enough to do the reforestation activities

Under the 1st and 2nd scenario, the available planting area should be divided equally to them. But since family members or workforce of each of the family is not always the same, the project will still have the decision to reduce or increase the number of hectare to be allocated for the individual families even though we have the average allocation per family.

In the 3rd scenario, the project will just ask the individual family the number of area /hectare they could reforest base on their family workforce while we are looking for additional participants. In case that those first takers under 3rd scenario will complete their area earlier and have still the time (considering that that are still undistributed lots), then, they can still request for additional area.

Before the start of planting activities, the interested family participants should sign a Memorandum of Agreement (MOA) where all conditions re: mode of payments, obligation and time to complete planting are stipulated in the attached MOA (Attachment 2).

In this approach, the project participants are the main entity responsible in the protection of the plantation areas as part of their obligation to prevent and/or control astray animals, grass fire and any untoward incident that may damage their farm lots or reforestation areas designated to them. Construction of fences

on their agroforestry farms and construction of mini fire lines at the boundary of the reforestation areas were done by the family participants in accordance with the MOA signed between project participants and the project.

2.3. Site preparation

The reforestation family participants should do the site preparation 2 weeks to 1 month before actual planting with high consideration of the rain occurrences. Under the project, cardinal direction (north-south; east-west) is preferred over contour planting due to monitoring issues dealing with big areas. Under the project design, planted indigenous trees will be counted quarterly to monitor the survival rate of the whole planted areas to be conducted by the project staff in the presence of the reforestation participants.

The following are the site preparation activities:

- a. Baseline and planting strip line establishments
 - Establish a baseline at the longest horizontal cross section of planting site following cardinal direction using nylon rope or other appropriate materials
 - Planting strips will be established in every 3 meters horizontal distance interval perpendicular to the baseline for reforestation and 5 meters for enhancement planting

- b. Staking to mark the planting spot on the ground
 - The planting spot in the strip line must be 3 meters away (horizontal distance)
 - Each planting spot will be marked with 45 cm height and minimum of 3 cm base diameter cutting of narra, kakawate, ipil-ipil and other species that could survive by cutting and could produce shade to the planted indigenous species. These are legumes and nitrogen fixer species
 - Make sure that markers/cutting are pointed properly and no bark damage
 - Cutting/marker must be stake into the soil passing through a hole made with the crow bars. Stake the cutting by push down with the palm. Soil surrounding the base of the cutting must be pressed to make it sure the soil have a good contact with the bark of the cutting to insure rooting

- c. Ring weeding
 - Planting spot must be cleared following spot brushing approach
 - If there are natural vegetation in the identified planting spot, move to the next spot
 - The desired size of clearing the planting spot is approximately 40cm – 50 cm to avoid too much clearing. Small growing natural indigenous species should be left uncut with the spot.
 - Grasses within the planting spot must be removed and will be use as mulching during planting

- d. Hole digging
 - Use crow bars during hole digging
 - Uproot rhizomes, stolons, roots of grasses to avoid nutrient competition
 - During hole digging, the first layer of brown top soil should be separated to be used as backfill (fertile top soil is to be put back to the hole, replacing the quantity of soil removed from the hole)
 - The size of the hole must be approximately twice the diameter and length of the seedling pot

- e. Payments for site preparation activities

Site preparation activities	Payment per activity (P)
Ring weeding/Strip brushing	P 1.50/ spot
Staking	P 0.25 /stake
Hole digging	P 1.00 / hole
TOTAL	P 2.75

3. PLANTATION ESTABLISHMENT

3.1. Selection of plantable seedlings

Minimum requirements for planting materials before they will release for out planting in the field

Seedlings ready for planting must have at least 40 cm in height from the root collar to the shoot or about 1 cm or cigarette base diameter. Seedlings must undergo process of hardening-off such as root pruning, less watering and gradual exposure to sunlight before they could be outplanted in the field.

3.2. Transport or hauling of plantable seedlings from nursery to planting site

The following must be observed to avoid compromising the quality of seedlings in the nurseries during seedlings transport to the planting site.

- a. If seedlings are to be transported by vehicle to the most accessible site, the seedlings should be filed properly in the vehicle carrier. During loading and unloading to and from the vehicle, make sure that seedlings are carried properly using trays/baskets/pail or any equivalent container. The base of the seedlings must be always supported by hands to avoid accidental uprooting of the seedlings from the pots. Don't carry the seedlings holding at the stem
- b. Don't transport seedlings when the weather is very hot to avoid wilting of seedlings
- c. Don't water the seedlings before transporting or don't do hauling just after the rain when the seedling pots are heavily saturated. The pots might be damage
- d. Cover the seedlings with nets when the seedlings in the car carriers are expose to wind
- e. Use seedlings carrier/ trays (balulang), backpack seedling carrier when hauling



- f. Make it sure that piece of hard object like piece of thin wood or plywood placed in the bottom of the sack to avoid too much movement of the pots during hauling by horse
- g. Don't immediately plant newly hauled seedlings. Give about 3-7 days rest under the shade near the planting site. Seedling should be minimally watered so that the soil in the seedling pot will be compacted and to cope up with the stress caused from transporting.
- h. Haul seedlings only when the planting site is already prepared
- i. Do not reduce soil from the seedling pots during hauling just to lessen weight

- j. Do not plant immediately the newly hauled seedlings especially during minimal rain fall. Rest the seedlings about 3-7 days in the shaded area near the planting site before planting. Water the seedling but minimal amount.

3.3. Field Planting

In the project site (Peñablanca, Cagayan), rainy season starts by May and end at December, sometime rains extended up to early February. So, from May-December are the planting months of the year. But due to changing weather condition, we have to observe the weather prior to planting even though May-December is the rainy season months. The following are some of the consideration before and during planting:

- a. Plant only during the identified rainy season or after the rain when the soil is moist/wet enough to favor the survival of the newly planted seedlings
- b. Plant seedlings which have gone through hardening with height of at least 40 cm or cigarette size base diameter
- c. Before planting, put 50 grams organic fertilizer into the planting hole then followed by about one inch backfill with good topsoil
- d. Before putting the seedling into the hole, make sure to remove the plastic bag carefully using sharp knife or cutter. Avoid breaking the soil to minimize disturbance of the roots of the seedling. Pull down the plastic slowly until it is totally removed from the balled soil then plant it to the hole.
- e. Plant 1 seedling to a hole only
- f. The seedling root collar should be at the same level with the ground surface
- g. Plant seedling straight at the center of the hole and back fill the planting hole using the topsoil/ black fertile soil removed during hole digging
- h. Press the soil around the base of the seedling and cover base with mulch using grasses or liters from the surrounding. Don't make the mulching attach to the base of the planted seedlings to avoid stem deterioration or termites attack.

3.4. Evaluation of reforestation area established by the reforestation participants prior to payment

Three to four weeks after planting, the planted area will be evaluated. In the evaluation, the survived seedlings will be counted and recorded per species

using an evaluation form. This is to determine how much the participants could receive for the labor rendered in planting. This will also determine if the participant followed the standard spacing, species mixture and conducted ring weeding. If there were mortalities, the participants will be notified to replant in order to maintain at least 80% survival as stated in the MOA.

3.5. Penalties

Failure to follow sub section 2.3-3.3, also corresponds to some consequences if not properly observed. Project staff, nursery aids or Reforestation Participants failed to follow the minimum requirements mentioned above will be sanctioned specified below consequences enumerated below.

- a. Nursery aids/staff who releases undesirable seedlings will be required to pay the equivalent amount of the seedlings or bring back all the seedlings without any compensation if not yet planted
- b. For the reforestation participants who planted seedlings in the field below the minimum requirements in terms of height and diameter will not be paid for planting. Only those seedlings met the criteria will be counted and paid.
- c. All seedlings damaged due to removal or reduction of soil from the potting bags will be paid by the responsible reforestation participants
- d. Payments to any reforestation participants who did not completed mulching, staking and fertilization will not be processed until properly complied
- e. Missing seedlings (base on nursery released and field evaluation) or dead mishandled seedling will be charge to the reforestation participants

3.6. Payments for planting activities:

Planting activities per seedling	Payment per activity (P)
Hauling from most accessible road to the site planting site	P 0.25 / seedling
Planting	P 1.50 / seedling
TOTAL	P1.75

4. PLANTATION MAINTENANCE AND PROTECTION ACTIVITIES

Plantation maintenance activities are crucial part of reforestation work. For the PPSRP, there are 2 considerations of protection and maintenance works: First, during the 1 year effectively period being handled by the reforestation participants under MOA, Second, after the duration of the effectively of the MOA.

4.1. Maintenance and protection works during and after effectively of the MOA with the reforestation participants

- a. Within the 1 year period / duration of the MOA, the participants should do the following maintenance activities in accordance with the sign MOA to meet the minimum of 80% survival rate of the planting area for the participants to receive the quarterly payments. The activities to be conducted were stated in sub section 4.3
- b. Maintenance and protection of the reforestation areas after the effectively of the MOA with the reforestation participants will be mainly responsibility of the project. The project will be hiring daily hired laborers to do maintenance protection activities but not limited to replanting, ring weeding, cultivation, fertilizer application.

4.2. Maintenance activities that must be done

- a. Replanting (follow planting procedure in sub section 3.3)
 - Dead seedlings (main stem is totally dried up to the root collar) must be replanted
 - Also plant another seedling near the previously planted seedlings that have not grown well will
 - Infected seedling with serious diseases (caused by aphids, termite/ants and other destructive insects) must be replace with other species
- b. Ring weeding (follow steps in sub section 2.3.c)
 - Weeded vegetation/grasses should be laid around the seedlings to serve as mulch. If the weeded vegetation is too much for mulching, pile it on site, just outside the ring-weeded areas.

- It is also important to identify the species of grasses and weeds per area thus this provide us information when to conduct ring weeding and must be done before they are at non flowering and non fruiting stage
- Note: Weeding should also be done when the weeds are still in non flowering stage and when grasses and weeds are already taller than seedlings. This is also crucial in the survival of the seedlings due to competition from sunlight and soil nutrients.
- Schedules of ring weeding activities:
 1. **The year of planting: Ring weeding** - at least 2-3 times per year. Sometimes, it will depend on the type of surrounding vegetation. In some cases, if the planting area is open, removal of grasses near the planted seedlings is not advisable during summer (grasses will serve as nurse vegetation). Ring weeding must be done on the on-set of rainy season or as need arising when soil moisture is still sufficient. Cut grasses will be use as mulching.
 2. **Second year from planting: Ring weeding with cultivation** (loosening of soil near the base of the seedlings) - 4 times per year (or quarterly). Weeding should be done while soil moisture is still sufficient.
 3. **Third year from planting: Ring weeding with cultivation** – 2 times per year depending on the density of weeds. Weeding should be done while soil moisture is still sufficient.
- c. Cultivation
 - Cultivation means loosening the soil surface with the use of trowel or small crew bar from the base of the planted seedlings up to a distance of about 10 cm – 20 cm away or wider if the planted indigenous species reaches about 2-3 base diameter. This activity will allow better aeration, hasten rain water infiltration, delaying growth of grasses.

d. Fertilization

- Application of fertilizer specifically Organic Fertilizers (OF) is very essential for the plant growth specially that most of the area are old pasture area and grass land. Steps:
 1. Dug a furrow (about 5-8 cm) surrounding the seedling of about 5-10 cm radius.
 2. Spread the 50 grams OF evenly distributed in the trench and cover the trench with soil. If the soil surface is sloping, it is advisable to put the fertilizer in upper part to avoid downhill of the fertilizer during rain occurrences

- Fertilization should be conducted according to the following schedule:
 1. **The year of planting** - 2 times a year at 50 grams per plant per application for reforestation seedlings. The first application is done at the time of planting. The second application should be before the end of the rainy season (i.e., by December). If the planting occurs during December, apply 50 grams OF per seedling then another 50 grams on the onset of rainy season the following year.
 2. **Second Year from planting** - 2 times a year at 50 grams per plant per application for reforestation seedlings. Preferably, apply at the start and before the end of the rainy season.

e. Mulching

In the reforestation project, mulching refers to putting up of cover surrounding the planted seedlings. The most common materials that could be use are the grasses that were remove during weeding and other litter found in the surrounding area such ask decaying tree barks, leaves.

Mulch is simply a protective layer spread on top of the soil or base on the plants. Importance of mulching are as follows:

- Protects the soil from erosion
- Reduces compaction of soil from the impact of heavy rains
- Conserves moisture, reducing the need for frequent watering

- Maintains a more even soil temperature
- helps the roots maintain an even temperature
- Slowdown or prevents weed growth
- organic mulches add to the nutrient when decompose and helps to keep the soil loose
- Note: But do not apply mulch directly in contact with plants. Leave an inch or so of space next to plants to help prevent diseases flourishing from excessive humidity.

4.3. Project monitoring

To insure that reforestation participant are following the guidelines, project will assigned trained point person to daily monitor and assist in daily ongoing activities in the field per site. This point person will be the one to report updates of the activities every end of the day. The technical in charge staff will follow schedule of actual visit in the area. In case of emergencies, the technical staff will prioritize to attend to those reported cases like conflict or technical inputs needed, etc.

4.4. Payments for quarterly maintenance:

Quarterly evaluation must be conducted after the reforestation participants completed necessary maintenance activities such as ring weeding wit mulching, fertilization, replanting. Activities are stated under 4.1.a. In the MOA, the refo participants will be paid for P 1.50 for every survived seedling if, the total survival rate reached 80% or above.

Quarterly Maintenance	2nd Quarter	3rd Quarter	4th Quarter	TOTAL PAYMENT
Replanting, Fertilization, weeding and mulching	1.5	1.5	1.5	P4.50/ per survived seedling
<i>Note: 1st quarter refers to planting (total of P 4.50/planted seedling)</i>				

5. INFORMATION, EDUCATION AND COMMUNICATION CAMPAIGN and FOREST FIRE PROTECTION

The main objective of this IEC and Protection (IFP) plan is to have a specific direction of IEC and Forest Protection initiatives that supports the protection and continuous

conservation of PPSRP area and the buffer zone through the active involvement of local partners: the DENR, LGU and local stakeholders/communities.

Under IEC and forest protection, creation of Task Force is highly considered to be composed of DENR Park Rangers, LGU representative, Barangay Official/Tanods and Project Staff representative/s. This Task Force will be headed by the DENR as Lead agency for protection. The following are the task to be conducted in support to Forest Protection.

In coordination with the Local Government units of Peñablanca and the Local Communities, the task force will facilitate and support the enactment of local Barangay ordinances or resolutions to regulate astray animals, forest fire pursuant to existing laws and penalizing concerned people.

5.1. Forest Protection activities

a. Patrolling activities

The Task Force shall conduct detection, surveillance, foot patrolling activities to the area including the look out towers manned by the CRGs must be always regularly done by DENR and Project staff. Apprehension of violators like illegal occupancy/squatting, illegal grazing, charcoal making and other related activities within the project and buffer zone areas pursuant to the NIPAS Act and PD 705 will be take charge by the partner DENR.

The Task force shall also always coordinate with each barangay to mobilize CRGs together with the assigned DENR Park Rangers who will conduct regular daily patrolling of the forest fire sectors and monitoring of the occurrence of forest fires. If forest fire is detected, the CRGs will immediately alarm the other CRG members, community members, and concerned project staff through cellular phones and request assistance to put off massive outbreak of forest fires and for further coordination. Likewise, if other forms of illegal and destructive activities are detected, the CRGs shall immediately report such activities to either to the PASu/DENR, Barangay Leaders, LGU or to the PPSRP Management Staff for proper action.

Arsonists/violators who will be caught in the project area will be prosecuted following standard procedures of the DENR in prosecuting forest violators. All necessary evidences shall be prepared by the CRGs during court litigation of charges. The CRGs shall likewise serve as witness in favor of the complainant or project.

b. Establishment of lookout towers

Towers should be located in strategic points and manned regularly during dry months or ideal. Patrol teams should be organized. These teams will be the one checking out fire anywhere in the area anytime. Construction of lookout towers within the reforestation project area especially if the project area is irregular in terms of topography is really in need of look out towers.



Manning of lookout towers by night will be scheduled to all covered barangays especially during summer to be manned by CRGs/DENR. Set of necessary firefighting equipments like back-pack type water sprayer, binocular, water storage/drum container, fire

swatter, bolo, rake, and communication and prepaid loads will be provided to each lookout towers. In case of fire/problem occurred, the watch man will immediately contact the project staff in the office and project staff to immediately disseminate the information and instruction to all contact in the area (all contact numbers of ground partners: CRGs, Barangay Officials and project participants) are all intact in the office for emergency reason.

Note : In the event of a forest fire outbreak in a sitio/barangay or in any part of project areas, the CRGs and community residents will put-off the fire and join forces by doing any or combinations of the following:

- Water spraying – CRGs will survey the sources of water from continuous creeks and live springs during dry season present in the project area.

- Backfiring- starting a fire at the opposite direction of the forest fire. The starting point for a backfire is a fire line or clean area.
- Construction of instant fire line strategically to prevent movement or creeping of fire to other areas.
- Allocation of fire swatter
- Removal or dispersing fuel and covering it with soil

c. Establishment of Check Points

Monitoring check point checkpoints within the critical areas or fire susceptible areas within the project area will be constructed to monitor the in and out of people in the project area. Logbook must be also installed to indicate their names, date, contact and time of entry and exit, purposes, and address/organization for records purpose. Manning of this checkpoint will be by either the DENR Park Rangers or the CRGs.

d. Construction of Fire line/break

A fire line is a strip of cleared land at least 3-5m (max. of 10m standard) that divides big reforestation plantation areas. Gullies, ridges, trails could be use as firelines by just removing all grasses and other debris highly susceptible to fire, except naturally grown trees. The established firelines will prevent the continuous creeping of fire from one portion in case of fire occurrence.

The firelines should be constructed starting the onset of summer and will be regularly maintain anytime the grasses are big enough that fire could pass through.

Major trails inside the project are the priority areas to be maintained to prevent accidental fire occurrence due to either unintentional/intentional throwing of cigarette butts.

Firelines depending on soil condition and necessity in the area, some portions of the identified firelines could be also planted with watery, fire resistant, and income generating species to serve as firebreaks. At least two (2) strips of firebreaks will be planted on both sides of major firelines with either kakawate, pineapple, banana, cassava, and other fast-growing tree

species like ipil-ipil and achoan dilau. Maintenance of these planted fire resistant species is needed to sustain their usefulness for fruit production. Those planted species could provide shade of the fireline that will help minimize growth of grasses.

e. Astray animals

Presence of astray animals within the reforestation project will lead to death of seedling planted, and compaction of soil.. To minimize problems associated to astray animals, make it sure that all animals within the project area will be transferred and possible entrance of animals to the project site will be close. Solving such kind of problem is a challenging task. Below are the recommended steps dealing with these problems:

- The community must be notified regarding the project and discuss the benefits and disadvantages if astray animals will remain in the project area
- All animal owners should be also notified and discuss / plan with them any possible win-win solutions but given that the ultimate goal is to move out all animals
- After all the information made and shared with concerned individuals; secure legal reference such as Barangay ordinance or resolution as basis for discussion. If no available basis, coordinate to the partners specially LGU to legislate Resolution addressing the problem as basis of the Barangay Level to issue Barangay Ordinances with corresponding penalties and sanctions for those who can't comply with the law

f. Capacity Building

Under forest protection, training to concerned members of Task Force on Law Enforcement, fire prevention and suppression will be also conducted to include partner's representatives, Community Reforestation Guards (CRGs) and partners' representatives.

5.2.IEC Campaign

a. IEC Core group

Communication and awareness component of the project is seen as a highly important tool to encourage support of project activities by the local stakeholders. Through awareness raising and social mobilization, people could be indirectly motivated to refrain from doing forest destructive activities and encouraged them to adopt appropriate and environmentally sound farming practices. In addition, training of school children and science teachers on non formal education using Dalaw Turo approach will be also to be conducted. The objective of the training is to enhance the skills of the school children and teachers to conduct non formal IEC methodology such as stage play and environmental games.

An IEC core group was formed and has been performing series of awareness activities during barangay assemblies and monthly celebrations like Philippine Eagle Week. Through this approach, CIP together with DENR continued conducting awareness campaign activities in the schools and barangays with audiences ranging from grade school pupils to local community members and barangay officials. This includes lectures and seminars on topics such as biodiversity conservation, reforestation, watershed management, habitat restoration and other relevant topics.

b. Conduct of meetings and community assemblies

One of the major threats in reforestation project is the occurrence of grass fire. In response to this threat, the project shall implemented awareness campaign activities to educate community about the importance of the project and prevention of occurrence of grass fire. The created task force shall also conduct information and education drive among the communities, barangay leaders, students from the college, high school and elementary levels to increase their awareness existing environment laws, rules and regulations.

Providing the right and timely information to the local communities helped to prevent and/or minimize the occurrence of fire and damage to the reforestation areas. The awareness campaign could be done through various media such as community meetings, awareness campaign activities, and distribution of IEC materials such as posters, streamers and billboards pertaining to the project, its importance and fire prevention

measures. Radio and TV program could be also utilized to reach a wider audience. Local ordinances and Municipal resolutions could also contribute to the protection of the reforestation areas.

c. Installation of signages or billboards

To make the communities aware on the fire prevention campaign, the project will facilitate the installation of billboards on forest fire prevention. This is to remind and raise the awareness of the community residents, non-residents, and the general public on the adverse effects of forest fires. Billboards or signage's will be installed strategically along reforestation project boundaries, fire-prone areas, entrance and exit points, boundaries of kaingin areas, and human settlements areas. Preferably, the billboard's content will be in local dialect so that the residents can understand the message.

PHILIPPINE PEÑABLANCA SUSTAINABLE REFORESTATION PROJECT

PAALALA

MGA ALITUNTUNIN SA LOOB NG REFORESTATION PROJECT SITE UPANG MAIWASAN ANG SUNOG :

1. Siguraduhing patay ang upos ng sigarilyo bago itapon;
2. Huwag manguha ng "buos" o "abuos";
3. Huwag magsilab ng mga damo sa gilid ng mga daanan sa loob ng project site;
4. Maglagay ng "Firelines" (2 metro ang lapad) sa palibot ng mga uma o kaingin na nasa loob ng project;
5. Huwag iwanan ang mga uma pag nagsunog lalo na pag nasa loob ng project site;
6. Iwasan ang paggawa ng uling or charcoal sa loob ng project;
7. Siguraduhing patay ang apoy sa mga pinaglutuan bago iwanan lalo na sa mga lugar malapit sa mga damuhan; at,
8. Huwag hayaan ang mga bata na maglaro ng puspuro/lighter sa loob ng project area.

ANG TAGUMPAY NG REFORESTATION PROJECT AY NASA KOOPERASYON NG LAHAT. MAGTULUNGAN TAYO UPANG MAIWASAN ANG SUNOG AT HINDI MASAYANG ANG ATING PINAGPAGURAN. PERA AT ORAS. IPAGBIGAY ALAM AGAD SA KINAUKULAN KUNG MAY NAPANSING SUNOG.

Mula sa: Conservation International , DENR , Lokal na Pamahalaan ng Peñablanca , Toyota at Lokal na Pamahalaan ng Barangay

d. Installation of Community bulletin boards/IEC Corner



Furthermore, IEC information corner in each barangay and in the municipal hall will be installed. The information corner will be set up to provide regular project updates to local communities involved in the project as well as other communities within the municipality of Peñablanca. In support to prevention of fire occurrences in the area, fire prevention streamers will be hanging within strategic areas. Lastly, in order to monitor the impact of awareness campaign activities, a set of indicators were developed to monitor changes in attitudes of the local community involved in the project.

Reference:

1. Department of Environment and Natural resources. Manual of Operations for Comprehensive Site Development. Forestry Sector project. Philippines
2. Improved Reforestation Technologies in the Philippines. Philippine Council for Agriculture, Forestry and Natural Resources Research and Development.

End

Table 1. List of indigenous species allowed under PPSRP Reforestation and Enhancement Planting components

Common Name	Family	Scientific Name
Balinghasai	Anacardiaceae	<i>Buchanania arborescens</i>
Akleng-parang	Leguminosae	<i>Albizia procera</i>
Alagao	Verbenaceae	<i>Premna odorata</i>
Alagasi	Urticaceae	<i>Leucosyke capitellata</i>
Alahan	Sapindaceae	<i>Guioa koelreuteria</i>
Alaiuhau	Meliaceae	<i>Aglaia cumingiana</i>
Alibangbang	Caesalpiniaceae	<i>Bauhinia malabarica</i>
Alilaua	Urticaceae	<i>Villebrunea trinervis</i>
Alim	Euphorbiaceae	<i>Melanolepis multiglandulosa</i>
Amamali	Leeaceae	<i>Leea aculeata</i>
Amugan	Rosaceae	<i>Prunus marsupialis</i>
Anagap	Leguminosae	<i>Archidendron scutiferum</i>
Anilao	Tiliaceae	<i>Colona serratifolia</i>
Aninguai	Flacourtiaceae	<i>Scolopia luzonensis</i>
Antipolo	Moraceae	<i>Artocarpus blancoi</i>
Apaped	Euphorbiaceae	<i>Glochidion luzonense</i>
Aunasin	Myrsinaceae	<i>Ardisia pyramidalis</i>
Bagawak	Verbenaceae	<i>Clerodendrum minahassae</i>
Bahai	Leguminosae	<i>Albizia saponaria</i>
Bakawan-gubat	Rhizophoraceae	<i>Carallia brachiata</i>
Balikbikan	Euphorbiaceae	<i>Drypetes longifolia</i>
Balobo	Tiliaceae	<i>Diplodiscus paniculatus</i>
Banaba	Lythraceae	<i>Lagerstroemia speciosa</i>
Banato	Euphorbiaceae	<i>Mallotus philippensis</i>
Bangkal	Rubiaceae	<i>Nauclea orientalis</i>
Batino	Apocynaceae	<i>Alstonia macrophylla</i>
Batino	Apocynaceae	<i>Alstonia macrophylla</i>
Bato-bato	Euphorbiaceae	<i>Drypetes littoralis</i>
Bieum	Meliaceae	<i>Cipadessa baccifera</i>
Bignai	Euphorbiaceae	<i>Antidesmas bunius</i>
Binayoyo	Euphorbiaceae	<i>Antidesma ghaesembilla</i>
Binunga	Euphorbiaceae	<i>Macaranga tanarius</i>
Bolong-eta	Ebenaceae	<i>Diospyros pilosanthera</i>
Buboy-gubat	Bombacaceae	<i>Samalia malabarica</i>
Bugkau	Rutaceae	<i>Toddalia asiatica</i>
Dapdap	Leguminosae	<i>Erythrina variegata (syn. E. orientalis)</i>
Dita	Apocynaceae	<i>Alstonia scholaris</i>
Duhat	Myrtaceae	<i>Syzygium cumini</i>
Dungon	Sterculiaceae	<i>Heritiera sylvatica</i>
Guyong-guyong	Hypericaceae	<i>Cratoxylum sumatranum ssp. blancoi</i>

Hagimit	Moraceae	<i>Ficus minahassae</i>
Halakan	Euphorbiaceae	<i>Glochidion urophylloides</i>
Hauili	Moraceae	<i>Ficus septica</i>
Himbabao	Moraceae	<i>Broussonetia luzonica</i>
Ibu	Sapindaceae	<i>Alectryon glaber</i>
Igyo	Meliaceae	<i>Dysoxylum gaudichaudianum</i>
Ipil	Leguminosae	<i>Intsia bijuga</i>
Is-is	Moraceae	<i>Ficus ulmifolia</i>
Kalios	Moraceae	<i>Streblus asper</i>
Kaluag	Flacourtiaceae	<i>Casearia grewiaefolia</i>
Kalumpit	Combretaceae	<i>Terminalia citrina</i>
Kamagong	Ebenaceae	<i>Diospyros blancoi</i>
Kanapai	Moraceae	<i>Ficus magnoliifolia</i>
Kangko	Meliaceae	<i>Aphanamixis polystachya</i>
Karaksan	Olacaceae	<i>Chionanthus ramiflorus</i>
Katakpo	Rubiaceae	<i>Psychotria luzoniensis</i>
Kubi	Moraceae	<i>Artocarpus ovatus</i>
Kupang	Leguminosae	<i>Parkia timoriana</i>
Kuyos-kuyos	Moraceae	<i>Streblus ilicifolius</i>
Ligas	Anacardiaceae	<i>Semecarpus cuneiformis</i>
Lunas	Rutaceae	<i>Lunasia amara</i>
Malabagna	Euphorbiaceae	<i>Glochidion phyllanthoides</i>
Malapapaya	Araliaceae	<i>Polyscias nodosa</i>
Malatungau	Melastomataceae	<i>Melastoma malabathricum</i>
Maluisak	Rubiaceae	<i>Neonauclea reticulata</i>
Mali-mali	Leeaceae	<i>Leea guineensis</i>
Mamalis	Pittosporaceae	<i>Pittosporum pentandrum</i>
Migtanong-puso	Euphorbiaceae	<i>Acalypha caturus</i>
Molave	Verbenaceae	<i>Vitex parviflora</i>
Narra	Fabaceae	<i>Pterocarpus indicus</i>
Niog-niogan	Moraceae	<i>Ficus pseudopalma</i>
Pagsahingin	Burseraceae	<i>Canarium asperum</i>
Paguringon	Hypericaceae	<i>Cratoxylum sumatranum ssp. sumatranum</i>
Pakak	Moraceae	<i>Artocarpus treculianus</i>
Pandakaki	Apocynaceae	<i>Tabernaemontana pandacaqui</i>
Rain Tree	Mimosaceae	<i>Samanea saman</i>
Rimas	Moraceae	<i>Artocarpus altilis</i>
Sablot	Lauraceae	<i>Litsea glutinosa</i>
Salisi	Moraceae	<i>Ficus benjamina</i>
Sarakag	Sapindaceae	<i>Lepisanthes tetraphylla</i>
Tadiang-anunang	Rubiaceae	<i>Canthium monstrosusum</i>
Takip Asin	Euphorbiaceae	<i>Macaranga grandifolia</i>
Talikhono	Loganiaceae	<i>Buddleja asiatica</i>
Tangisang-	Moraceae	<i>Ficus variegata</i>

bayawak		
Tibig	Moraceae	<i>Ficus nota</i>
Tindalo	Leguminosae	<i>Afzelia rhomboidea</i>
Tuai	Euphorbiaceae	<i>Bischofia javanica</i>
Tulibas-mabolo	Rutaceae	<i>Micromelum compressum var. inodorum</i>
Uas	Sapindaceae	<i>Harpullia arborea</i>
Wild Santol	Meliaceae	<i>Sandoricum vidalii</i>
Wisak	Rubiaceae	<i>Neonauclea media</i>
Yakal	Dipterocarpaceae	<i>Shorea astylosa</i>
	Apocynaceae	<i>Ochrosia ackeringae</i>
	Bignoniaceae	<i>Radermachera grandiflora</i>
	Celastraceae	<i>Gymnosporia spinosa</i>
	Euphorbiaceae	<i>Securinega virosa (syn. Flueggea virosa)</i>
	Leguminosae	<i>Caesalpinia latisiliqua</i>
	Leguminosae	<i>Moghania macrophylla</i>
	Leguminosae	<i>Moghania strobilifera</i>
	Leguminosae	<i>Phyllodium pulchellum</i>
	Olacaceae	<i>Olax imbricata</i>
	Rosaceae	<i>Prunus arborea</i>
	Rubiaceae	<i>Pavetta indica</i>
	Rubiaceae	<i>Psychotria gitingensis</i>
	Rubiaceae	<i>Tarenna cumingiana</i>
	Rubiaceae	<i>Wendlandia luzoniensis var. membranifolia</i>
	Sterculiaceae	<i>Helicteres hirsuta</i>
	Tiliaceae	<i>Grewia eriocarpa</i>
	Verbenaceae	<i>Callicarpa formosana</i>
	Verbenaceae	<i>Vitex quinata</i>

Appendix 12. List of vulnerability and irreplaceability trigger species of terrestrial fauna for the PPLS key biodiversity area.

Scientific Name	Common Name	Distribution and Conservation Status IUCN (2006)	Habitat	Remarks
<i>Pithecophaga jefferyi</i>	Philippine Eagle	Philippine Endemic- CR	Prefers primary forest but occurs in residual gallery forest	
<i>Oriolus isabellae</i>	Isabela Oriole	Luzon Endemic- EN	Canopy of forest (especially bamboo forest) and forest edge	Status changed to CR in the 2009 IUCN Red List
<i>Platymantis taylori</i>	Taylor's Igorot Frog	Luzon Endemic- EN	Inhabits the forest floor stratum in lower montane and lowland forests. Breeds and makes nests in leaf litter; direct developer.	
<i>Acerodon jubatus</i>	Golden-crowned Fruit Bat	Philippine Endemic – EN	Primary and secondary lowland forest up to 1100 m. Some roosts reported from mangrove and on small islands (Hoogstraal, 1951; Rabor, 1986).	
<i>Pteropus leucopterus</i>	Mottle-winged Flying Fox	Luzon Endemic - EN	Poorly known. Moderately common in primary montane forest on Catanduanes, present in lowland forest	Status changed to LC in the 2009 IUCN Red List
<i>Pelochelys cantorii</i>	Cantor's Soft-shelled Turtle	Widespread- EN	This is found in freshwater streams and deep, slow-moving rivers, often far inland.	
<i>Anas luzonica</i>	Philippine Duck	Philippine Endemic - VU	Marshes and inland waters	
<i>Bubo philippensis</i>	Philippine Eagle Owl	Philippine Endemic - VU	Forest at lower elevations	
<i>Ceyx melanurus</i>	Philippine Dwarf Kingfisher	Philippine Endemic - VU	Primary forest	
<i>Ducula carola</i>	Spotted Imperial-pigeon	Luzon Endemic- VU	Forest and forest edge from the lowlands to 2000 m.	

<i>Erythrura viridifacies</i>	Green-faced Parrotfinch	Philippine Endemic - VU	Forest, especially in bamboo, probably above 1000 m.	
<i>Hypothymis coelestis</i>	Celestial Blue Monarch	Philippine Endemic - VU	Forest, forest edge and second growth but usually in the upper stories	
<i>Muscicapa randi</i>	Ashy-breasted Flycatcher	Philippine Endemic - VU	Forests, probably in the understorey, below 1200 m.	
<i>Otopteronus cartilagonodus</i>	Luzon Pygmy Fruit Bat	Luzon Endemic - VU	Known only from primary and well-developed secondary forest, in lowland, montane, and mossy forest from 200 m to 1900 m. Abundance is low to moderate, usually most common at middle elevations	Status changed to LC in the 2009 IUCN Red List
<i>Haplonycteris fischeri</i>	Philippine Pygmy Fruit Bat	Philippine Endemic - VU	Common in primary forests, especially at middle elevations; rare in secondary forest, and absent in entirely agricultural areas. It occurs from about 150 m to 2250 m; abundance usually increases with elevation up to about 1500 m, and then declines	Status changed to LC in the 2009 IUCN Red List
<i>Spizaetus philippensis</i>	Philippine Hawk-eagle	Philippine Endemic - VU	Lowland and mid-mountain forest	
<i>Sus philippensis</i>	Philippine Warty Pig	Philippine Endemic - VU	Formerly abundant from sea level to at least 2800 m, in virtually all habitats (Rabor, 1986); now common only in remote forests (Danielsen et al., 1994; Heaney et al., 1991, in press).	
<i>Pitta kochi</i>	Whiskered Pitta	Luzon Endemic- VU	Montane forest on or near the ground,	

			usually above 1000 m.	
<i>Platymantis pygmaeus</i>	Pygmy Forest Frog	Luzon Endemic- VU	Inhabits the forest floor litter of montane and lowland rainforests.	
<i>Platymantis sierramadrensis</i>	Sierra Madre Forest Frog	Luzon Endemic- VU	Inhabits arboreal microhabitats in lower montane and lowland forests.	
<i>Kaloula kalingensis</i>	Kalinga Narrow-mouthed Toad	Luzon Endemic- VU	Inhabits the lower montane and lowland forests but occasionally found in human-controlled habitats beside these forests.	
<i>Prioniturus luconensis</i>	Green Racquet-tail	Luzon Endemic- VU	Found in forest edge and cultivated areas of the lowlands and foothills	
<i>Ptilinopus marchei</i>	Flame-breasted Fruit-dove	Luzon Endemic- VU	Resident of primary forest from 500-2500 m.	
<i>Hylarana (Rana) tipanan</i>	Brown and Alcala's Sierra Madre Frog	Luzon Endemic- VU	Inhabits cool mountain streams and rivers in lower montane and lowland forests. Breeds and lays eggs in water; it is presumed that tadpoles develop in water.	
<i>Rhyacornis bicolor</i>	Luzon Water-redstart	Luzon Endemic- VU	Found in clear, undisturbed mountain streams and rivers above 300 m.	
<i>Zoothera cinerea</i>	Ashy Ground Thrush	Luzon Endemic- VU	Forest on or near the ground	
<i>Rhynomyias insignis</i>	White-browed Jungle-flycatcher	Luzon Endemic- VU	mossy forest above 1000 m.	

<i>Varanus olivaceus</i>	Monitor Lizard	Luzon Endemic - VU	The hillsides frequented by the lizard are covered with thick rainforest and have many cliffs and rock outcrops. Although its total range is small (about 5000km ²) Gray's monitor appears to be common in many areas. However its very secretive habits and cryptic coloration enable it to evade detection.	
<i>Bradypterus caudatus</i>	Long-tailed Bush-Warbler	Luzon Endemic- RR	Montane forest, forest edge and dense second growth above 700 m.	
<i>Rhabdornis grandis</i>	Long-billed Rhabdornis	Luzon Endemic- RR	middle elevation forests	
<i>Stachyris striata</i>	Luzon Striped-Babbler	Luzon Endemic- RR	Understorey of forest, including bamboo forest, forest edge and second growth below 500 m	
<i>Stachyris whiteheadi</i>	Chestnut-Faced Babbler	Luzon Endemic- RR	Forest, second growth and scrub; usually above 800 m but sometimes in lowland forest down to 100 m.	
<i>Turnix ocellata</i>	Spotted Buttonquail	Luzon Endemic- RR	Grasslands with occasional bushes	
<i>Ptilinopus merrilli</i>	Cream-bellied Fruit-Dove	Luzon Endemic- RR	Resident of forest up to 1000 m.	
<i>Cyornis herioti</i>	Blue-breasted Flycatcher	Luzon Endemic- RR	Lowland and middle elevation forests in the understorey	
<i>Gallicolumba luzonica</i>	Luzon Bleeding Heart Pigeon	Luzon Endemic- RR	Primary and secondary forest, feeding on the forest floor	
<i>Napothera rabori</i>	Rabor's Wren Babbler	Luzon Endemic- RR	Lowland forest and second growth up to 1000 m.	

<i>Otus longicornis</i>	Luzon Scops-Owl	Luzon Endemic- RR	Both rain forest and pine forest from 350-2200 m.	
<i>Pachycephala albiventris</i>	Green-backed Whistler	Luzon Endemic- RR	Canopy and understorey of forests from the lowlands up to 2000 m.	
<i>Penelopides manillae</i>	Tarictic Hornbill	Luzon Endemic- RR	Forest up to about 1000 m.	
<i>Phaenicophaeus cumingi</i>	Scale-feathered Malkoha	Luzon Endemic- RR	Forest up to 2000 m.	
<i>Phaenicophaeus superciliosus</i>	Red-crested Malkoha	Luzon Endemic- RR	Forests and sometimes in cogon grasslands with bushes	
<i>Lanius validirostris</i>	Mountain Shrike	Philippine Endemic- RR	In clearings in oak and pine forest, open second growth, forest edge and scrub in grasslands	
<i>Parus semilarvatus</i>	White Fronted Tit	Philippine Endemic- RR	Forests, forest edge and second growth below 1000 m.	
<i>Dicaeum anthonyi</i>	Flame-crowned Flowerpecker	Philippine Endemic- RR	Forests, particularly mossy forests, and forest edge, in fruiting and flowering trees	
<i>Prioniturus montanus</i>	Montane Racquet-tail	Philippine Endemic- RR	Forest resident usually above 1000m.	
<i>Pyrrhula leucogenis</i>	White-cheeked Bullfinch	Philippine Endemic- RR	Mossy forest and forest edge	
<i>Coracina coerulescens</i>	Blackish Cuckoo-shrike	Philippine Endemic- RR	Forest and second growth	

