



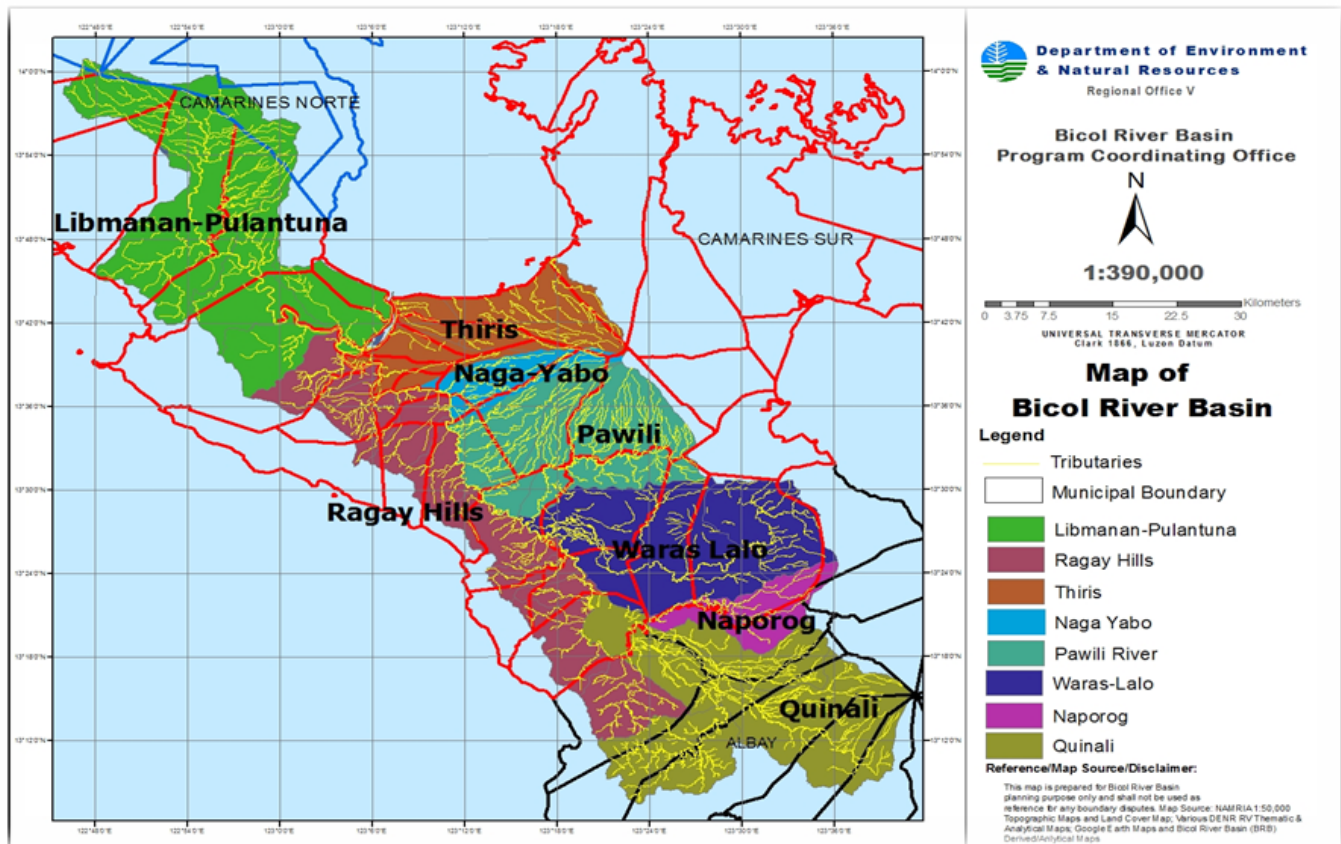
# Integrated Ecosystems Management:

*Collecting individual efforts together to overcome challenges and achieve joint benefits in ENR management*

National Program Support for Environment and Natural Resources Management Project (NPS-ENRMP)

An IEM Story:

## Libmanan-Pulantuna Watershed: Replicating Integrated Ecosystem Management for Socioeconomic Development



### Introduction

The Libmanan-Pulantuna Watershed Management Project (LPWMP) is one of the four pilot sites for Integrated Ecosystems Management (IEM) under the National Program Support for Environment and Natural Resources Management Project (NPS ENRMP), funded by a grant from the World Bank-Global Environment Facility (WB-GEF). After five years of project implementation from 2008 to 2012, the pilot site has

emerged as a good example of replication and scaling up of IEM from the Libmanan-Pulantuna Watershed to the adjacent Albay Tres Quinale "A" Watershed, then the rest of the Bicol River Basin. It stands out as the only one among the four pilot sites to have reached such basin-wide level of replication.

As a watershed ecosystem, LPW plays a significant role in hosting the biodiversity

of the remaining forested zone of the Bicol Region, cushioning the adverse effects of disasters due to typhoons, supporting local agricultural production through provision of irrigation water, and ensuring the conservation and sustainability of fisheries resources of San Miguel Bay.

### **Importance of the Libmanan-Pulantuna Watershed**

With a total area of 74,345 hectares, the Libmanan-Pulantuna Watershed (LPW) is one of the eight major watersheds of the Bicol River Basin (BRB). BRB is considered the eighth largest river basin in the country.

There are different stakeholders that benefit from the improved management of the LPW through IEM. These include fuelwood gatherers, upland and lowland farmers, fisherfolks in San Miguel Bay and other inland water bodies, and users of domestic waters that are sourced from the LPW and coursed through the water districts. Beneficiaries also include tourists visiting points of interest within the LPW as well as researchers doing biodiversity and related scientific investigations on the remaining lowland dipterocarp forest in Region 5. Then of course, standing to benefit also are the seven other subwatersheds of the Bicol River Basin where the best IEM practices generated from the LPW are now beginning to be replicated.

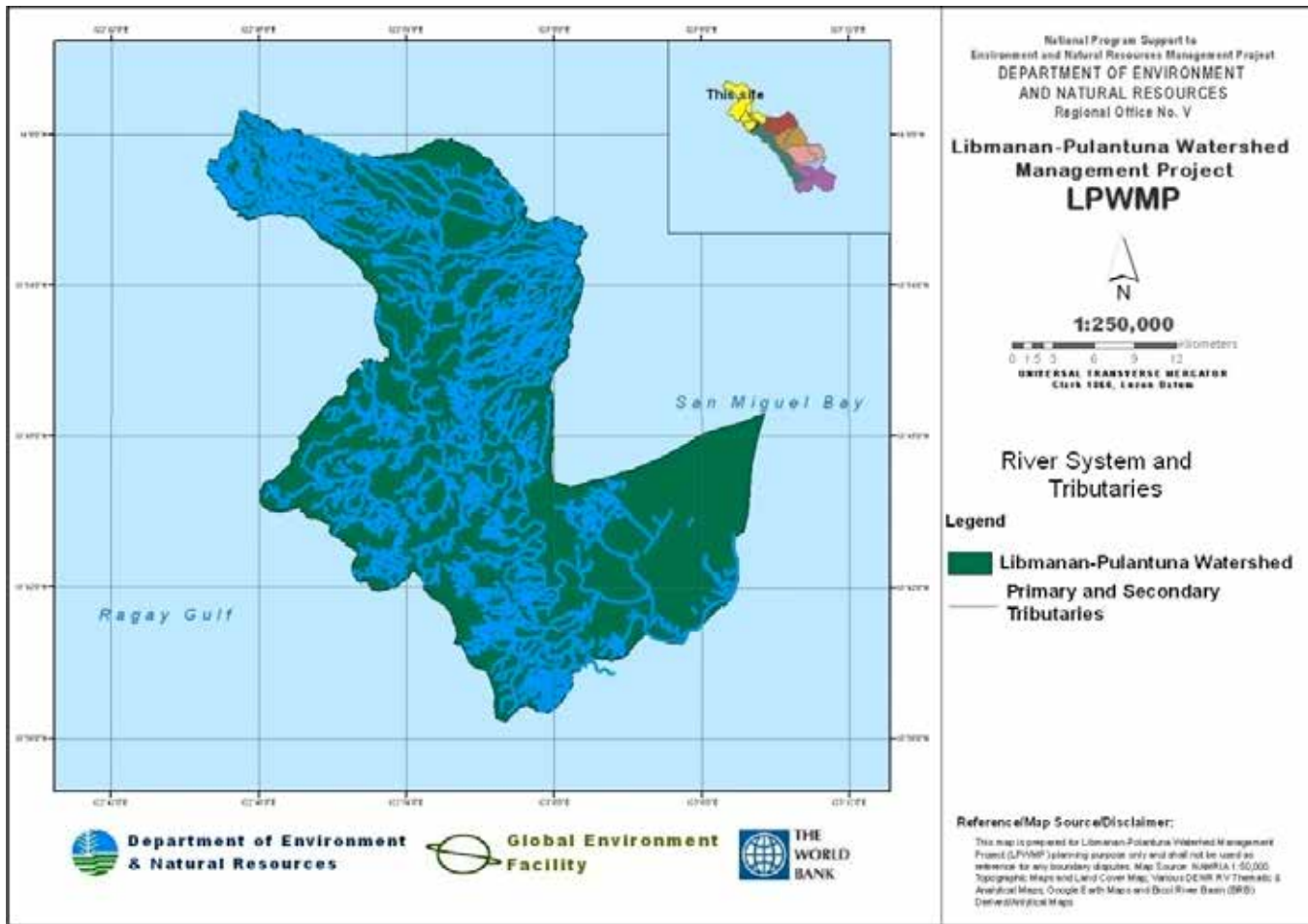
LPW covers portions of the municipalities of San Lorenzo Ruiz and Basud of Camarines Norte Province and Del Gallego, Ragay, Lupi, Sipocot, Libmanan, and Cabusao of Camarines Sur Province. The watershed covers a total of 143 barangays and has a total estimated area of 74,345.75 hectares. It is within the first congressional district of Camarines Norte and the first and second congressional districts

of Camarines Sur. The area is close to two major educational, commercial, and trading centers: Daet on the north and Naga City on the south.

The watershed has rich biodiversity and abundant water resources that support current and future development activities in the lowlands. It hosts the biggest remaining forest in the whole Bicol Region—a lowland forest situated at elevation of below 500 meters above sea level. It is home to lowland dipterocarp forests of Bicol Natural Park; the residual and old growth forest of Mt. Pulantuna; the secondary forest of Mt. Tancong Vaca; the flora and faunal resources of Libmanan Caves Natural Park; and the mangrove forest of the Cabusao Coastal Zone. These assets contain potentials for ecotourism activities such as mountain hiking, river cruising, swimming, birdwatching, fishing, and many others. Water-based resorts have been established in Libmanan and Sipocot, which can be put up as well in other areas if given the impetus by the local government units (LGUs) and other sectors concerned.

The river system provides irrigation water to the estimated 4,000 hectares of rice lands of Libmanan and Cabusao, which is considered as the rice granary of Camarines Sur. Moreover, its upland areas, inland rivers, and coastal areas provide fiber, protein, and income for the estimated 30,222 households or a population of 167,087. About 20,367.76 hectares of coconut land provide a major source of income for many farmers. The area is likewise a source of fuelwood and charcoal from trees which naturally regenerate in coconut lands. Livestock production is a dominant livelihood in the municipalities of Sipocot and Libmanan.

As an important part of the Bicol River Basin, the LPW contributes to the productivity and



sustainability of San Miguel Bay, a major fishing ground in the Bicol Region. The bay is a common property resource that serves as municipal fishing ground for the towns of Mercedes in Camarines Sur, Sipocot, Cabusao, Calabanga, Siruma, and Tinambac in Camarines Norte. The bay hosts 88 species of fishes including crustaceans and shell fishes. The map below shows river networks of the Bicol River Basin that drain to San Miguel Bay.

### Problems and Threats: Critical Watershed

The locality has climate type II and IV under the Corona Classification System generally

having wet months with no pronounced dry season. While it is favored with abundant water supply year-round, it also experiences an average of 19-21 typhoons every year, causing damage to life and property.

**Continuing Depletion of the Remaining Natural Forest.** While there are some lowland dipterocarp natural forests remaining in the LPW, these left over forests are subject to increasing threats. Kaingin or subsistence shifting agriculture in these areas eliminates biodiversity due to clearing and burning of forest vegetation. Charcoal making has also become prevalent, contributing as well to forest depletion. An apparent aggravating factor is the open access condition of these forestlands.





**Weak Land Tenure System in in the multiple use zone of the Bicol Natural Park.** This situation serves as disincentive among the current occupants who think that they could be driven out of their occupied land any time. As such, they tend to employ unsustainable production practices like burning of vegetation and open cultivation, resulting in environmental deterioration in the long term. The situation also makes the area prone to the entry of more illegal settlers.

**Wrong Location of Some Settlements.** Some built-up areas are located in forests, near forests, or in headwaters of vital subwatersheds. The location of some settlements in the Bicol Natural Park is a case in point which affects the water source of Barangays Alanao, Napolidan, and Sooc. The threat has mounted through the years due to increasing number of settlers who aggressively

migrate there despite concerted efforts to stop them. Some migrants are armed with guns and bolos who have repeatedly challenged DENR operatives during patrol work. The barangay councils and people's organizations (POs) in the area lack the capacity to check violations of environmental laws without help from law enforcement agencies.

**Waste Management.** Solid and sewerage wastes generated by households, industries, markets, and farms are affecting the water quality of nearby rivers. Because many households do not have sanitary toilets, sewerage get drained into canals and end up in rivers. Solid wastes thrown indiscriminately are carried to the rivers during flood events.

**Conflicting Land Uses and Objectives Between Geothermal Energy Generation Versus Biodiversity Conservation.** The

geothermal reservation proclaimed by then Pres. Ferdinand E. Marcos is located in the municipality of Del Gallego, in the upper watershed of LPW. Test wells have already been drilled in the area during the 1990s. Its steep slopes are highly sensitive to massive erosion due to surface soil scraping as observed during the years when roads and geothermal facilities were under construction. Because the area contain the headwaters of the Pulantuna River, massive river siltation and biodiversity loss are expected should construction of geothermal facilities be revived. This conflict in resource use dampens current efforts at conserving the area for its inherent ecotourism values. The harm to the biodiversity and water is incalculable because of the unpredictable collateral damage resulting from earth movement; removal of surface vegetation; and generation of toxic sludge, atmospheric pollutants, and noise.

**Road Network Traversing Bicol Natural Park.** The past government practice of building roads near old growth forests has negatively led to the extraction and destruction of biodiversity resources. This road has a double-edged effect on the remaining natural forests because it has improved access and



transport of goods and services between the two Camarines provinces but has also served as entry point of illegal settlers and timber poachers. In the Bicol Natural Park, it was during the time that it was traversed by the highway and the National Power Corporation power lines that kaingin farming in the area began. The park is now crisscrossed by a network of roads and is highly accessible from all directions. Settlements within and near the park are becoming highly populated through inter-marriages and migration from other towns and provinces.

**Unresolved issue on the environmental impact of the proposed dam in Manangle, Sipocot.** Started during the administration of President Gloria Macapagal- Arroyo, the completion of the dam remains uncertain. And so are the environmental impacts to the nearby communities of Lupi and Sipocot. The construction of the dam was temporarily stopped due to intense opposition from different sectors. The dam is projected to irrigate an estimated 2,000 hectares of ricelands in Cabusao and Libmanan. The technical intricacies attendant to the dam construction must address foremost the vulnerability to flooding of communities and agricultural lands during peaks of rainfall in the context of climate change. This issue has to be resolved before the dam construction is resumed.

**Inadequate irrigation infrastructure.** Water is abundant in the watershed but ironically, large rice farms in Libmanan and Cabusao do not have adequate supply of water during the dry season due to lack of irrigation infrastructure. Dubbed as the rice granary of the province, these areas have yet to attain their optimum productivity.

**Silted and polluted coastal zones.** Siltation and pollutants are threatening the mangroves and the bird sanctuary in Cabusao. The coast of Cabusao manifests a lingering environmental problem. The silt and filth of the entire Bicol River Basin of which LPW is part are all drained toward the San Miguel Bay. The waters of the coastal areas are also laden with wastes, mostly plastics and other non-biodegradable materials. Nevertheless, the remaining asset of the area is the presence of the mangrove forest and the abundant fauna that serve as food to the migratory birds visiting the area at certain times of the year. This gives Cabusao a comparative advantage in terms of ecotourism. Meanwhile, San Miguel Bay suffers from problems of illegal fishing and unsustainable resource use.

### Convergence to Protect and Conserve LPW

The convergence for the protection and conservation of LPW was facilitated by the

NPS ENRMP through a process that ran from October 2008 to May 2011. The process started with a stakeholder dialogue followed by write shops involving an inter-LGU technical working group for the formulation of the LPW IEM framework. The framework was reviewed and subsequently approved by the LPW Management Council.

The IEM framework laid down the guiding principles for the holistic management of land, water, and living resources in the Libmanan-Pulantuna Watershed. It sought to unify individual and collective actions in managing the watershed for conservation, socio-cultural and economic development. Thus, the IEM framework served as the blueprint for the management and development of the LPW for the benefit of the present and future generations of the constituent LGUs embraced by the watershed. Based on this blueprint, each of the constituent LGUs crafted their ENR management plan that covers their geographical share of the LPW, addressing the management and development of the environment and natural resources in their respective municipalities that include forestland, agricultural land, urban and coastal areas. Thus, their ENR plans became part of their municipal development plans for which they set aside budget in their annual investment plans.

The LPW Management Council is co-chaired by the DENR 5 Regional Executive Director and the governors of Camarines Norte and Camarines Sur, with the following as members: Department of Agriculture (DA) Regional Director, National Irrigation Administration Regional Manager, Department of the Interior and







Local Government (DILG) Regional Director, Commander of the 9th Infantry Division of the Philippine Army, mayors of the eight municipal LGUs embraced by the LPW, Local Water District General Manager for Libmanan, Camarines Sur, Sipocot Council of Women President, Sangguniang Kabataan presidents of Libmanan, Camarines Sur and Basud, Camarines Norte, Central Bicol State University of Agriculture President, Kabalikat Civicom (Sipocot Chapter) President and Cabusao Municipal Fishery and Agricultural Resources Management Council President. The TWG, on the other hand, consists of second line leaders of the same organizations/institutions.

At first, only some of the WMC members were enthusiastic about the LPW joint undertaking. Eventually, however, as the IEM

framework development and legitimization progressed, the interest of the rest of the LGUs was sparked aroused and they began to embrace ownership of the formulated vision and mission for the LPWMP. The vision is “God-fearing and empowered stakeholders are demonstrating their leadership and management capability on integrated watershed management and fulfilling their obligations for the attainment of quality of life for all.” On the other hand, the mission is “To discover, nurture and advocate for the full development of the human potentials of the stakeholders to enhance the abundance, sustainability and equitable sharing of the goods, services and other benefits derived from the Libmanan-Pulantuna Watershed.”

The shared vision and common goal for the LPWMP bound the members of the WMC

and TWG as one solid team. The two groups meet bimonthly to update each other on the progress of each LGU in the performance of their respective tasks in the management and development of LPW. The LGUs take turns in hosting and sponsoring the meetings. In each particular venue, the host LGU gives a briefing on their ENR program, coupled with field visit. The meetings then become a mutually uplifting exercise, serving as opportunities for the members to appreciate and learn from what each one is doing.

### **Improved Ecosystem Governance Among LGUs**

The commitment of each LGU in contributing and doing their share in the improved management of the LPW is sealed through a partnership agreement. This is a document that captures the commitment and obligations between each LGU and the local DENR in the management and development of LPW. The document stands for shared stewardship for the ENR component of the LPW in that particular LGU. Each LGU has an organized Municipal Co-Management Steering Committee that provides oversight and make decisions on the management over their portion of the LPW.

### **Identification and Determination of the Non-Negotiables in LPW**

The LGUs also participated in the identifying and acting on the **non negotiables** (NNs) or non-compromise areas in the watershed. These NNs are designated land and resource allocations whose intended uses and purposes cannot be compromised or modified. Their protection and wise management redounds to sustaining the productivity of the LPW to benefit the present and upcoming generations

of Bicolanos. The NNs also include types of investments that shall be disallowed in a watershed-ecosystem or highly diverse area.

For LPW, the identified NNs include the Bicol Natural Park (BNP), the Libmanan Cave Natural Park, the Cabuaso Bird Sanctuary and mangrove forest, the remaining forests in forestlands, prime irrigated agricultural lands devoted to rice production, and high hazard areas that include the flood risk and high erosion areas. These are the rallying points for the conservation of the LPW. The Watershed Management Council of LPW has passed a resolution formally recognizing these NNs, with common agreement that these are to be managed and regulated for the purpose of providing public and collective benefits over time such as supply of various ecosystems goods and services to upstream and downstream communities. The LGUs have formally committed with the DENR to take part in the conservation and management of these NNs, particularly those located in their respective political jurisdiction.

For Bicol Natural Park for instance, each of the four covered MLGUs of Basud, Lupi, San Lorenzo Ruiz and Sipocot has entered into partnership MOA with the DENR. Under this MOA, the local DENR and the four MLGU jointly formulate and implement their Integrated Conservation Development plan (ICDP) for the BNP. Each LGU committed to allocate a yearly counterpart fund as part of the LGU's Annual Investment Plan (AIP) for a given year for the implementation of the ICDP as well as to enact ordinances in support of the ICDP-BNP and for strengthening the management, conservation and protection of the BNP. The Region 5 Protected Area, Wildlife and Coastal Zone Management Services (PAWCSZM), on the other hand, has set



aside budgets in its programs, activities and projects (PAPs) for the improved management and development of the Bicol National Park and Libmanan Cave Natural Park. Same is true with the Forest Management Sector (FMS) for the management of forest tenures like the CBFMA holders.

On the other hand, the Libmanan LGU takes care of the cave natural park in their locality, while Cabusao is focused on the coastal clean-up, protection and rehabilitation of the bird sanctuary and mangrove forest in their domain. The high risk areas with flooding and advance erosion occurrences are responsibilities of all the LGUs for which they do forest rehabilitation initiatives with counterpart funding from the WB-GEF and the LGUs themselves.

### Protection and Rehabilitation of the Remaining Forests

Recognizing the crucial role of the remaining forest in LPW, some policy and conservation initiatives have been pushed as safeguard against forest depletion due to timber poaching, charcoal making and shifting cultivation. First, with the facilitation of the LPW Management Council, an administrative circular was issued by the DENR 5 Regional Executive Director regulating the issuance of charcoal and cutting permit within a one-kilometer distance from the Bicol National Park. Likewise, selling and possession of forest products within the same distance shall be subject to permitting system by the LPW Management Council. The absence of pertinent documents shall be subjected to apprehension, confiscation

and prosecution. Thus, this administrative circular has effectively strengthened forest protection within the LPW. In addition, to lessen pressure on existing forests, alternative fuelwood and timber plantations were established in the different municipalities to serve as the new source of wood needed for fuel and construction materials. In most partner municipalities, wood production was done in tandem with food production through agroforestry systems.

### Addressing Climate Related Risks through Automatic Weather Station

With financial support from the NPS ENRMP, the partner LGUs, the DENR and the Philippine Atmospheric, Geophysical and Astronomical Services Administration have joined efforts for the establishment and maintenance of an automatic weather station (AWS) in LPW. The AWS was installed in the municipality of Basud, Camarines Norte. Equipped with automatic instruments to measure stream level, rainfall depth, wind



velocity and relative humidity, among others, the AWS can serve as a warning system for any impending flash flood, while in the long term, it can provide agro-meteorological basis for cropping patterns and farming activities within the watershed.

## Results of Collaboration

The partnership and collaboration of the DENR with LGUs and civil society for the management and development of LPW has borne fruits that are worth noticing by managers of the rest of other watersheds in the Bicol Region and the rest of the country. Such results include the following

**IEM has become a rallying point for conservation of LPW.** The introduction and promotion of IEM for the holistic and multi-stakeholder management and development of LPW has paid off. It has rallied the support and participation of key stakeholders including the DENR, LGUs, community and the civil society. These local stakeholders have banded together to form a coalition of the willing for the improved management and development of LPW. This is expected to continue even beyond the implementation stage of the NPS ENRMP .

**LGU buy-ins.** After having been convinced of the importance and viability of IEM, the LGUs through their local chief executives have committed participation and financial support for the undertaking. They have made it a regular component of their annual investment plans and budget allocation. Acting out on their commitment in support of IEM, the LGUs have begun to translate/incorporate the non-negotiables in their comprehensive development and investment plans.

**Preservation and conservation of remaining forests.** The regulation on wood cutting in

natural forests and the strengthened barangay level forest law enforcement have effectively preserved and conserved the remaining forests in the watershed. As such, their ecosystem services have also been sustained.

**Restoration of degraded environment.** The forest rehabilitation projects undertaken by the partner LGUs in partnership with the DENR have contributed to the cause of restoring quality environment. A total area of 1,020 hectares have been rehabilitated with WB-GEF financial support, with counterpart funds from the LGUs.

**Generation of sustainable livelihoods.** The project provided financial and technical assistance in starting up various livelihoods that included agroforestry, mud crab fattening, vegetable production, bio-organic fertilizer production, bamboo production for furniture and other uses, tiger grass production for broom making, coco coir twining, and pili and rattan plantation establishment. Overall, these livelihoods have helped over two thousand beneficiaries. To help ensure success in these livelihoods, the partners were provided training and technical assistance. These livelihoods are expected to be sustained even after the project.

**Self-sufficiency, self-reliance.** Seeing the fruits of their collaboration under the project, the local communities and people's organization members have realized that they can be self-reliant and self sufficient in terms of food production and generating supplemental income.

## Replication and scale up of IEM

As the watershed-ecosystem level planning and implementation in LPW progressed with good results, replication of the Integrated





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Ecosystem Management (IEM) approach was initiated for the Albay Tres Quinali “A” watershed (ATQAW) applying the improved processes and steps from the LPW. This IEM replication was facilitated and fast-tracked with the leadership and championing role of Albay Governor Joey Salceda. Himself an economist and aggressive advocate of climate change mitigation and adaptation, he pushed for the adoption of the ATQAW IEM Framework supported by a sound feasibility study. With his support, the Regional Development Council readily approved the IEM Framework for funding and implementation.

Further IEM scaling up is also expected to follow in other Bicol watershed-ecosystems with the adoption of IEM approach by the

National Convergence Initiative, a strategic, holistic and coordinated development alliance between the DENR, DA, Department of Agrarian Reform, and DILG. Starting with the Albay NCI Provincial Steering Committee also chaired by Governor Salceda, IEM has already been phased in to the development plans and strategies of the Albay Provincial LGU. Related to this, the Bicol River Management Office has been established at the DENR 5 Regional Office. The Bicol River Basin Management Council is providing technical assistance for the creation of environment offices among the municipal and city LGUs within the Quinali “A” watershed and the protection and management of the non-negotiable areas in the watershed.



## Impacts of LPWMP

Being a long-term environmental and social intervention, it will take some more time before the tangible impacts of the LPWMP can be seen. At this stage, however, the following initial impacts have already been observed.

**Positive changes in attitude towards environment.** This is both at the level of the LGU officials and their constituency as a result of vigorous information and education campaign and after seeing the project actually implemented with positive results. Consequently, they have become more supportive and participative to the project.

**Livelihood creation for the community.** These established livelihoods are helping augment income and food availability for local households. The plantations established are sufficient sources of planting materials for subsequent plantings and related livelihood initiatives.

**Learned skills on financial management and enterprise investment.** Hands on experience and training of PO members have helped develop the needed skills and confidence to go on among the POs.

**Surfacing of TAP governance virtues.** The project participants expressed their appreciation after seeing and experiencing for themselves the blessings and benefits of transparent, accountable and participatory IEM.

**Sharing of profits and benefits.** The project participants also appreciated getting their share of the benefits from the livelihood initiatives under the project and are enthusiastic to expand and sustain these livelihoods.

**Show window of PO for the community to follow.** The POs are enthusiastic about the success of their livelihood and rehabilitation initiatives and are proud to show it to visitors and the community. The community, on the other hand, are appreciative of what the project has done and the resulting environmental benefits like better microclimate, reduced soil erosion, and improved water supply.

## Looking Forward

The IEM experience and approach evolved in Libmanan-Pulantuna Watershed is worth following through as the good environmental governance, livelihood and natural resource rehabilitation initiatives continue to yield positive results. As replication and scale up efforts are pursued wider to the level of the Bicol River Basin, it is hoped to spread the approach and bring benefits to other major river basins in the country. Thus, as the LPWMP phases out at the end of this year, sustainability plans have been finalized specifically on the aspect of institutional arrangements, social, economic/financial and environmental sustainability.

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