



FFTC Agricultural Policy Platform (FFTC-AP)

Available online at: <http://ap.fftc.agnet.org/index.php>

From Ridge-to-Reef: A Community-Based Participatory Approach to Biodiversity Conservation of Marine Resources in Batad, Iloilo, Philippines

Hene L. Hapinat, EdD¹

¹ Research and Development Services, Northern Iloilo Polytechnic State College, Batad Campus, Batad, Iloilo, Philippines

e-mail: genexylem@gmail.com

ABSTRACT

The project primarily aimed to strengthen land, forest and reef management processes and biodiversity conservation on all terrestrial landscapes and marine and seascapes in Batad, Iloilo Philippines. This will be achieved through a community-based strategy having a ridge-to-reef approach that increases marine protected areas and provide livelihood opportunities to the poorest coastal communities by gaining possible funding from public and private agencies or NGOs worldwide. This is a program that helps in addressing the agenda and sustainable development goals of the government in response to the economic challenges that the Philippines is facing today. The program is envisioned to provide a long-term solution to the critical coastal habitats and marine ecosystems that have been severely damaged during the onslaught of the killer Typhoon Haiyan (Yolanda) in 2013. The devastation left havoc to the coastal communities and mercilessly destroyed the livelihood of the entire fishing community. Thus, the need to conduct this extension program must be in-place. The establishment of mangrove forests that serve as barrier for natural catastrophe, reduces the impact of climate change, and provides sanctuary for wildlife species. Also, the effective breeding ground for marine resources will boost the eco-tourism industry of the Municipality. The urgent need of creating and managing Marine Protected Areas (MPAs) are valuable in the sustainable production of marine resources for the continuity and security of livelihood, welfare of human beings and marine creatures. These are among the major outputs of the program for the biodiversity conservation and enhancement of the agri-fishery industries of the target recipients. This community-based development will work hand in hand with the Local Government Units, barangay executives, and the coastal communities to make them feel that each one is of part of the solution. What is unique in this program is the establishment of the intercommunication and social solidity among coastal communities not only to bring economic benefits but also strengthen their brotherhood in safeguarding their environment.

Keywords: Mangrove forests, Marine Protected Areas (MPA), biodiversity conservation, community-based participatory approach, ridge, reef

INTRODUCTION

The education of individuals, families and communities about environmental protection, food security and blue economy are of utmost concerns that this proposed extension program would like to address in consonance to the program of the present Philippine government on Sustainable Development Goals (SDGs).

This proposed extension program will focus on the following priority areas: (1) Entrepreneurship education for farmers and fishermen; (2) Blended-learning technologies in agricultural and fisheries higher education; (3) Marketing and financial literacy for farm and fishing communities; and (4) Fisheries resource management. The program will develop a mindset among individuals, the value of protecting and conserving natural resources through sustainable community-based coastal management.

The main objective of this program is to establish mangrove forests for ecotourism park and the creation of Marine Protected Areas (MPAs) through sustainable and effective community-based participatory activities from ridge-to-reef approach. Specifically, it aims to: (1) strengthen the management of identified critical coastal habitats and/or protection/restoration of mangrove forests and management of Marine Protected Areas (MPAs); (2) create Biodiversity Information System for effective resource management and monitoring of marine resources in the area; (3) develop technologies for alternative or supplementary livelihoods for coastal people during closed fishing season months; (4) organize effective, functional and sustainable coastal community livelihood association; (5) conduct intensive training on safe hygiene and sanitation among households; and (6) introduce agricultural farming techniques in coastal communities (blended-learning technologies).

BRIEF LITERATURE REVIEW

The establishment and restoration of mangrove forests are very important in the biodiversity and conservation of the coastal areas of the Municipality of Batad, Iloilo, Philippines. According to the UN Joint Assessment Report and CEC-Philippines (2014), up to 3 km of mangroves in Brgy. Embarcadero, Municipality of Batad, Philippines indicate signs of free phase oil contamination during the onslaught of the killer Typhoon *Haiyan* (locally coded as Typhoon *Yolanda*) in 2013. This area, which is along the coast and the riverside, is part of an estimated 10-hectare mangrove site. In the findings of Dr. Resurreccion Sadaba of the Oil Response Program of the University of the Philippines Visayas, around 4 hectares of both old-growth and reforested mangrove areas in the Municipality of Batad are heavily covered with oil. Among those affected is an area planted with 10-year-old mangrove species, *Rhizophora stylosa*. The impact likewise damaged the fishing ground including the Municipal Marine Protected Areas (MPAs) of the municipality that is still on the state of recovery.

On the other hand, one of the solutions being used to address the threats plaguing marine resources is the establishment of marine protected areas (MPAs). MPAs refer to “clearly defined geographical spaces, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values” (Dudley, 2008) as cited by Cabral *et al.*, 2014. This is one of the most achievable modes of protection particularly in the Philippines in relation to coastal resource management (CRM) (White *et al.*, 2002, Aliño 2008 as cited by Cabral *et al.*, 2014). The Philippines is a signatory to the United Nations Convention on Biological Diversity (CBD), of which one of the targets is to protect 10% of all marine and coastal habitats by 2020. This is in addition to various national, regional, and global initiatives of the Philippine government to protect marine resource.

The restoration of mangrove forests and the establishment of Marine Protected Areas (MPAs) promotes the “ridge-to-reef” approach in biodiversity conservation of coastal resources. This management approach, addressing threats in the uplands, lowlands and coastal areas in an integrated way is expected to result in the development of coastal resources that is sustainable, allowing these resources to continue

providing environmental services to support livelihood, eco-tourism, industrial and other socio-economic activities specifically in the target coastal communities in Batad, Iloilo, Philippines (Aquino, *et al*; 2014).

SIGNIFICANCE OF THE PROJECT

The following are benefits that can be derived by Higher Education Education Institutions (HEIs) from this extension program platforms:

A. To the extension mission of the Higher Education Institutions (HEIs) to the community: (1) It gears toward the fulfillment of the extension mission statement of the College, that is, the development and implementation of innovative and high-quality extension programs to its beneficiaries to meet the diverse needs of the socially and educationally disadvantaged in the quest for an improved quality of life; and (2) It helps in assisting the cultural, social, moral, environmental, and economic upliftment of the local communities in support to the mission statement of the extension program of the academe;

B. To the extension mission of the HEIs to industry: (1) It accelerates the capability of HEIs to offer industry-oriented programs and produce graduates that can undertake research and extension projects for community development; and (2) It provides a wider avenue in working together synergically with industries by producing quality manpower as engine for economic growth;

C. In promoting community-based learning and improving curricular offerings in agri-fisheries: (1) It establishes constructive partnerships between the community and higher education institutions by helping alleviate social, economic, and environmental adversity and to enrich the quality of coastal community life that can be integrated in an effective agri-fisheries curriculum; and (2) It widens the scope and application of research in agri-fisheries curriculum by acknowledging the role of the community in facilitating and disseminating outputs of community-based research/extension projects.

D. In providing a model for a ‘Scholarship of Community Engagement’ that other HEIs can emulate : (1) It encourages collaboration with other HEIs, LGU, coastal communities, and other linkages for the mutually beneficial exchange of knowledge and resources in a context of partnership and reciprocity that other HEIs can look up to; and (2) It provides avenue for the HEIs to showcase their best practices that other institutions can look up to, and be incorporated in curriculum, research and extension activities and other community engagement of the academe; and

E. In demonstrating the value of inter-disciplinary approaches to develop solutions to societal problems: (1) It allows intercommunication and social solidarity among coastal and academic communities not only to bring economic benefits but also strengthen their brotherhood in safeguarding their environment; and (2) It encourages civic engagement, ethical development, appreciation for diversity, and deeply integrated learning among target recipients, and academic community at all levels across disciplines by providing solutions to environmental problems.

METHODOLOGY

Environmental conservation and protection can be attained through the establishment of mangrove forests and creation of MPAs. These can be done through the creation of the Technical Working Groups (TWGs), whose expertise are in line with the project, and enhancement of the tie-up between linkages and partner agencies. The ridge-to-reef participatory approaches encourage shared decision-making, cooperation, collaboration, mutual respect, confidence building and empowerment from the community members. By incorporating such elements into all levels of developmental activities, communities become more engaged, informed, and responsible for their own sustainable development. Such approaches build capacity, resource continuity and livelihood security. It increases learning and strengthens capacity for the protection of human beings and marine creatures.

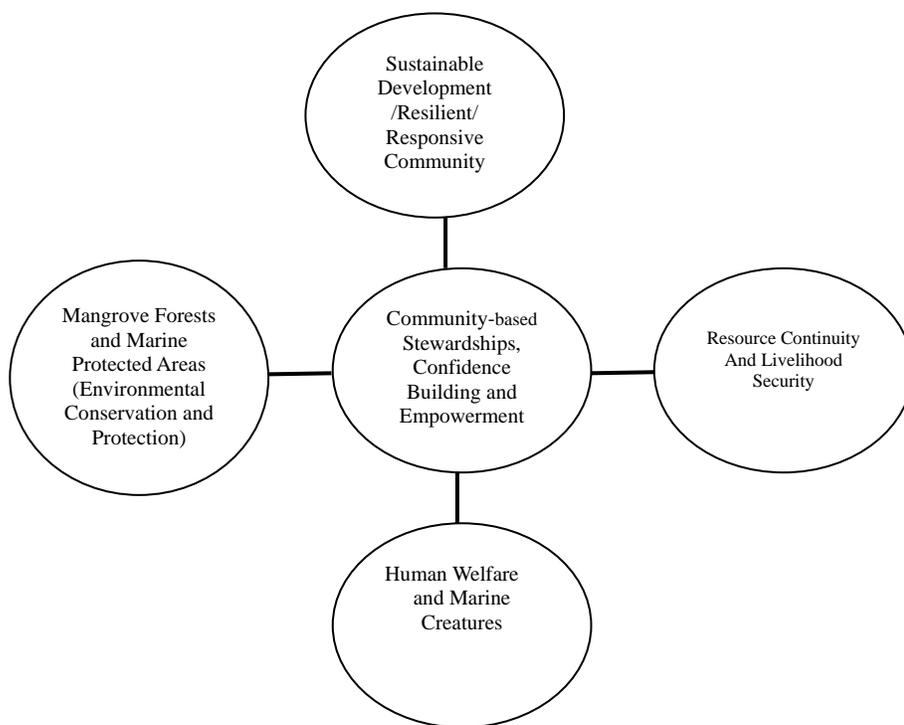


Figure 1. The extension framework design

Beneficiaries’ profile/target participants

The Municipality of Batad is a 5th class municipality located in the Northern tip of Iloilo Province, about 125 kilometers from the City of Iloilo. It is bounded on the North by the municipalities of Balasan and Estancia, on the West by the municipality of Pilar Capiz, on the south by the municipality of San Dionisio and by the Visayan Sea on the East. Batad is composed of 24 barangays, 18 are inland while 6 are coastal areas.

The target recipients of this project are six (6) coastal barangays in the municipality namely: Tanao (including Magalumbi Island), Alinsolong, Binon-an, Embarcadero, Salong, and Banban. These coastal barangays cover the 29 hectares of fishing ground located within the Visayan Sea (Figure 1). This territorial coast produces abundant harvests of prawns, crabs and all kinds of fishes that are plentiful during peak fishing months if the ecological resources are protected and conserved. These products are sold within and outside of the municipality, such as neighboring towns, in the city of Iloilo, outside of the Province and even exported abroad. Fish processing such as dried fish and other marine products are abundantly supplied by the coastal communities before, however, these can be revived into a budding fishery industry through high-quality sustainable extension program.



(photo credit to the MPDO-Batad)

Figure 2. The coastal map showing the six coastal barangays in the Municipality of Batad, Iloilo, Philippines.

Sustainability and project continuity

By incorporating the elements of shared decision-making, cooperation, collaboration, mutual respect, confidence building and empowerment into all levels of developmental activities, the communities become more engaged, informed, and responsible for their own sustainable development. Such approaches build capacity, resource continuity and livelihood security.

The involvement and commitment of the concerned coastal communities, students, academic communities, LGUs and other stakeholders and the formation of community organizations will provide continuity of the project. For instance, the establishment of mangrove forests into an eco-tourism park will provide learning site and income to the community that enhances its eco-tourism industry. The creation of effective and sustainable MPAs will boost the economic and agri-fishery industries of the Municipality. This will eventually provide an avenue for other funding sources that will support this collaboration. Likewise, the local government unit (municipal and barangay level) will strengthen its legal and jurisdictional framework by intensifying all laws pertaining to coastal management. This is to ensure for the continuity of the biodiversity conservation efforts of this project. The signing of Memorandum of Agreement (MOA) between HEIs and LGU-Batad will strengthen the collaboration into a long-lasting commitment for this endeavor. The strategies can sustain organizational integrity and deliver successful projects that last beyond the interventions of the funding agencies

Dissemination plan

Activities	Strategy
1. Establishment of Learning Site, recreational haven and sanctuary for marine resources and wildlife species (Eco-Tourism Park)	<ul style="list-style-type: none"> - Promote the mangrove site as area for educational tours, recreational activities and the like, conducting lectures, video presentations, and actual hands-on activity on the experimental site, (i.e. demonstration activity in making artificial reefs in MPA sites, and others), creation of Biodiversity Information System and mangrove nurseries. - Provide income for the people living near the coastal areas by developing their knowledge and skills in agri-fishery industries. - Provide sanctuary for the proliferation of marine resources and home for wildlife species by conserving mangrove forests.
2. Curriculum enhancement for agri-fisheries and academic strands of SHS	<ul style="list-style-type: none"> - Enhance the agri-fishery courses by aligning and structuring the curriculum towards the trends and needs of the society and industries. - Integrate concepts of biodiversity conservation on course syllabi and learning plans of teachers. - Require each graduating student to plant 10 mangroves' seedlings and conduct coastal clean-up at the mangrove park of the Municipality as part of the mandated requirement to the community by the academic institutions.
3. Introduction of agricultural farming techniques (blended learning technologies) and sustainable livelihood program and/ or association for fisherfolks	<ul style="list-style-type: none"> - Establish floating garden, pot gardening, and others. - Conduct livelihood training (transfer of technology) on different methods of fish/shell preservation through effective product development and packaging, utilization of wastes from shells to produce lime for their crops and feeds for their poultry and livestock. - Help coastal communities in the establishment of sustainable livelihood association/ and or cooperatives and be officially registered to Securities and Exchange Commission (SEC) and or Cooperative Development Authority (CDA).
4. Environmental awareness campaign through cultural activities	<ul style="list-style-type: none"> - Conduct yearly contests like “<i>Paligid ko, Linis Ko</i>” program, “<i>Enviro-Painting, Enviro- Music Composition</i> in local dialect, <i>Enviro-Recycling</i> and other related community-based cultural activities that aim to recognize the talents and collaborative efforts of individuals in environmental protection and conservation; promote community bonds and brotherhood. Through these activities, they become more aware, engaged, informed, and responsible for their own sustainable development. - Strengthen legal and jurisdictional framework of all laws pertaining to environmental protection and conservation.
5. Production of primers	Provide primer on Community-Based Mangrove Rehabilitation and Establishment of MPAs (at least 2 publishable materials and patents).

TERMS OF REFERENCE (TOR)

Extension Title : From Ridge-to-Reef : A Community-Based Participatory Approach to Biodiversity Conservation of Marine Resources in Batad, Iloilo, Philippines

Principal Investigator : HENE L. HAPINAT

Implementing Institution : Office of Research, Development and Extension (RDE) Services

Collaborating Institutions : LGU-Batad, DENR-PENRO-6

Period Covered : 2 Years

Objectives

The objectives of this program are: (1) To strengthen the management of identified critical coastal habitats and/or protection/restoration of mangrove forests and management of Marine Protected Areas (MPAs); (2) To create Biodiversity Information System for effective resource management and monitoring of marine resources in the area; (3) To develop technologies for alternative or supplementary livelihoods for coastal people during closed season months; (4) To organize effective, functional and sustainable coastal community livelihood associations; (5) To conduct intensive training on safe hygiene and sanitation among households; and (6) To introduce Agricultural Farming Techniques in Coastal Communities (blended-learning technologies).

Scope

The program and its component projects will be integrated to help the target recipients establish mangrove forests (eco-tourism park) and to create Marine Protected Areas (MPAs) through sustainable and effective community-based participatory activities.

Sampling, design and data treatment

The proposed extension program will utilize the experimental and descriptive methods (qualitative-quantitative design). Benchmarking and thorough consultations with Local Chief Executive (LGU), *Sangguniang Bayan* members, barangay officials, DA-BFAR, DENR-PENRO6 and coastal communities will be done to disseminate the rationale of the program and to get the consensus and commitment of the people involved in the project. The components of this extension program are as follows:

Activities	Deliverables/Outputs	Due date
COMPONENT I. Survey of Waste Disposal Activity/ Determination of Seawater Quality		
Phase I -Survey of waste disposal activities along coastal community of Batad, Iloilo	Benchmark information on the wastes' disposal practices of the coastal communities	Month 1 (1 month)
Phase II. Bacteriological and physicochemical analysis of seawater along Batad, Iloilo territorial coast	Data on bacteriological and physicochemical content of seawater and its possible impact on the biodiversity of marine organisms.	Month 1 (1 month)

Phase III. Assessment and evaluation	Comprehensive data of the wastes' disposal activity and seawater quality along Batad, Iloilo territorial coast	Month 2 (1 month)
COMPONENT II. Establishment of mangrove forests /eco-tourism park		
Phase I -Cite identification/Benchmarking Activities	Identified mangrove forests for the establishment of eco-tourism park	Month 1 (1 month)
Phase II -Planting of ideal species of mangroves	Target areas fully planted with ideal species of mangroves	Month 2 to Month 14 (13 months)
Phase III -Care and maintenance/ monitoring and evaluation	Ensured that the site care and maintenance is in accordance to policy and standards of the LGU/DENR.	Month 15 to Month 18 (4 Months)
Phase IV -Crafting of primer for sustainable community-based mangrove forests	Primer for sustainable community-based mangrove forests successfully produced.	Month 19 to Month 22 (4 Months)
Phase V -Writing and submission of final report	Final reports with supported documents submitted on time.	Month 23 to Month 24 (2 months)
COMPONENT III. Establishment of Marine Protected Areas (MPAs)		
Phase I -Cite identification/ benchmarking Activities	Identified areas for the establishment of MPAs	Month 1 (1 month)
Phase II -Establishing and managing marine reserves	Target MPAs fully managed for marine reserved	Month 2 to Month 14 (13 months)
Phase III -Care/maintenance/ monitoring & resource mapping/ creation of Biodiversity Information System	-Ensured that the site care and maintenance is in accordance to policy and standards of the LGU/DENR. -Establishment of accessible Biodiversity Information System' for effective resource management monitoring of marine resources within the territorial coast of Batad, Iloilo	Month 15 to Month 18 (4 Months)
		Month 19 to Month 22

Phase IV -Crafting of Primer for Effective MPAs	Primer for sustainable community-based mangrove forests successfully produced.	(4 Months)
Phase V –Writing and submission of final report	Final reports with supported documents submitted on time.	Month 23 to Month 24 (2 months)
COMPONENT IV. Establishment of sustainable coastal community association and livelihood project		
Phase I -Training on effective solid waste management and sewerage system (Recycling of bio-non-bio wastes)	Biodiversity conservation and natural resources management. reduction/ elimination of material transfers from households and reducing ‘downstream’ effects of agriculture and forestry on coastal aquatic ecosystems	Month 1 (1 month)
Phase II -Introducing agricultural farming techniques in coastal communities (blended learning technologies)	Doable blended-learning technologies for agri-fishery industries	Month 2 to Month 3 (2 months)
Phase III -Organize effective, functional and sustainable coastal community and livelihood association	-Sustainable livelihood program for coastal community. -Develop/ transfer of technologies for alternative or supplementary livelihoods for coastal people -Organize effective, functional and sustainable Coastal Community Association registered at SEC/CDA.	Month 3 to Month 4 (2 months)
Phase IV -Designing effective and sustainable enviro-Community activities	Preservation of unity and spirit of commitment exhibited among coastal communities through cultural values towards environmental conservation.	Month 5 (1 month)
Phase V -Monitoring and evaluation and writing of final reports	-Ensured effective delivery of project outcomes -Final reports with supported documents submitted on time.	Month 6 (1 month)

CONCLUSION

Community-based mangrove restoration in Batad, Iloilo, Philippines is an effective mitigating measure from ridge-to-reef approach with enormous potential benefits to both people and biodiversity: (1) From economic perspective: Mangroves can be empowered to cultivate fish and shrimps that will provide economic benefits. The dependence of our traditional fishermen on catching fish will be reduced in the presence of aquaculture in mangrove areas. This does not require costs or time to develop and energy compared to fishing in the sea; (2) For the social impact on Mangroves: It develops the intercommunication and social bonds among coastal communities that strengthens the brotherhood among citizens in safeguarding their mangrove forests; and (3) For environmental considerations: It provides home for sea animals, contributes to reducing the impact of climate change, contributes to the security of the coastal zones by reducing the impact of typhoon and tsunamis, shoreline protection and improves water quality, prevents sea water abrasion, and provides food and building materials for those who live in the areas (Sunyowati, *et al.*, 2016).

The effective approach to environmental protection can be achieved through the establishment of community-based projects that will take place in communal settings. The involvement of local stakeholders from design to implementation is important consideration. Such projects recognize the contributions made by formally structured community partners to project success. Communities are organized to bring people together to take collective responsibility in sustaining and managing their environment and resources. Organized communities ensure local participation of men and women acting together. Such communities are strong and can form alliances with other groups for advocacy work. They can sustain organizational integrity and deliver successful projects that last beyond the interventions of the funding agencies. Community organizing is a means of socially preparing people to take more control over their lives and secure a better livelihood and future.

REFERENCES

- Aquino, A. P., & Correa, A. D. (2014, July 30). Asia-Pacific Information Platform on Agricultural Policy. Retrieved June 3, 2019, from http://ap.ftc.agnet.org/ap_db.php?id=282
- Cabral, R.B., Aliño, P.M., Balingit, A.M., Alis, C.M, Arceo, H.O., Nañola, C.L. and Geronimo, R.C. The Philippine Marine Protected Area (MPA) Database; 2014.
- Department of Environment and Natural Resources, Bureau of Fisheries and Aquatic Resources of the Department of Agriculture, and Department of Interior and Local Government. Philippine Coastal Management Guidebook No. 5. Managing Coastal Habitat and Marine Protected Areas. Coastal Resource Management Project of the Department of Environment and Natural Resources, Cebu City, Philippines. 2010. 106 p.
- Primavera, J.H., Savaris, J.P., Bajoyo, B.E. Coching, J.D., Curnick, D.J., Golbeque, R. L., Guzman, A.T., Henderin, J. Q., Joven, R.V., RA Loma, R.A., and Koldewey, H.J. Manual on Community -Based Mangrove Rehabilitation, Mangrove Manual Series No. 1; 2010
- Rapid Assessment of the Environmental and Health Impacts of the Estancia Oil Spill Incident TECHNICAL REPORT AGHAM-Advocates of Science and Technology for the People, Center for Environmental Concerns-Philippines (CEC-Phils) and Bayan Muna-Panay, February 2014
- Sunyowati, D., Hastuti, L., Butar-Butar, F. The Regulation of Sustainable Mangroves and Coastal Zones Management in Indonesia. *J. Civil Legal Sci* 6: 220.doi. 2016;10.4172/2169-0170.1000220
- Sustaining our Coast: The Ridge-To-reef Approach, a Compilation of Technical and Policy Paper. (2013). Retrieved February 15, 2017, from <http://faspelib.denr.gov.ph/node/379>