The Philippine National Aquasilviculture Program

*Romeo E. Dieta and Florida C. Dieta**

National Brackishwater Fisheries Technology Center, Bureau of Fisheries and Aquatic Resources, Department of Agriculture , Quezon City, Philippines
redcalf2003@yahoo.com

Abstract

The Philippine National Aquasilviculture Program (PNAP) is a banner program of the Department of Agriculture (DA) being implemented by the Bureau of Fisheries and Aquatic Resources (BFAR). To implement the PNAP, a Memorandum of Agreement (MOA) was executed between BFAR and the Commission on Higher Education (CHED). The program concept is primarily mangrove resource rehabilitation and livelihood provision to help address climate change, food security and poverty among municipal/artisanal coastal fisherfolks. To achieve its goals and objectives, the BFAR identified three strategic interventions, such as: (1) replanting of destroyed mangrove resources; (2) establishment of community-based multi-species hatcheries (CBMSH), and (3) provision of aquasilviculture livelihood projects to fisherfolk-beneficiaries throughout the country. As envisioned, the BFAR shall provide support funds for the establishment, operation and management of the PNAP while CHED shall provide logistical support during program implementation. The program covers at least 71 state universities and colleges (SUCs) and 61 provinces throughout the country. Potential areas targeted by the PNAP are abandoned, undeveloped and underutilized (AUUs) fishpond lease agreements (FLAs) and the Department of Environment and Natural Resources (DENR) identified areas (*Key Biodiversity Areas, reforestation areas and co-management agreement areas*) from BFAR coastal Regions 1 to 13 and the Autonomous Region of Muslim Mindanao (ARMM). Participating agencies are DA-BFAR Regional Fisheries Offices (RFOs) and Provincial Fisheries Offices (PFOs), CHED (SUCs), DENR Provincial Environment and Natural Resources Offices (PENRO) and Community Environment and Natural Resources Offices (CENRO), and the local government units (LGUs) in the provinces and municipalities. Target beneficiaries for the aquasilviculture livelihood projects are at least 1,000 coastal fisherfolks and for the community-based multi-species hatcheries are 64 SUCs who were signatories to the MOA. For mangrove rehabilitation, the PNAP will involve the coastal fisherfolks in the planting of 100 million propagules for the next 3-4 years. Funding support from BFAR are PhP 6.00 per surviving propagule, PhP 1.2 million per SUC for the establishment and operation of CBMSH and PhP 65,000 per aquasilviculture project. As part of the over-all management strategy, a National Steering Committee (NSC) was formed to formulate policy guidelines of the PNAP while Regional Steering Committees (RSCs) were created to oversee policy implementation in the regions. Program Management Offices (PMOs) were formed to implement and supervise program implementation in the provinces. Community Organizers (COs) were hired in each province to assist in the implementation of daily activities. The approved PNAP implementing guideline details the procedures to follow, both relating to the technical and administrative operations of the program.

Keywords: PNAP, mangrove, rehabilitation, aquasilviculture livelihood projects

Introduction

The Philippines is an archipelago of more than 7,100 islands with a marine habitat hosting one of the world's richest aquatic biodiversity. It has a total land area of 300,782 square kilometers representing only one-seventh of its total territorial water area (*including the Philippines Exclusive Economic Zone, EEZ*) of 2.2 million square kilometers, excluding inland aquatic resources estimated at 496,000 hectares (Figure 1). The Philippine coastline stretches to around 36,000 kilometers (BFAR, 2011).

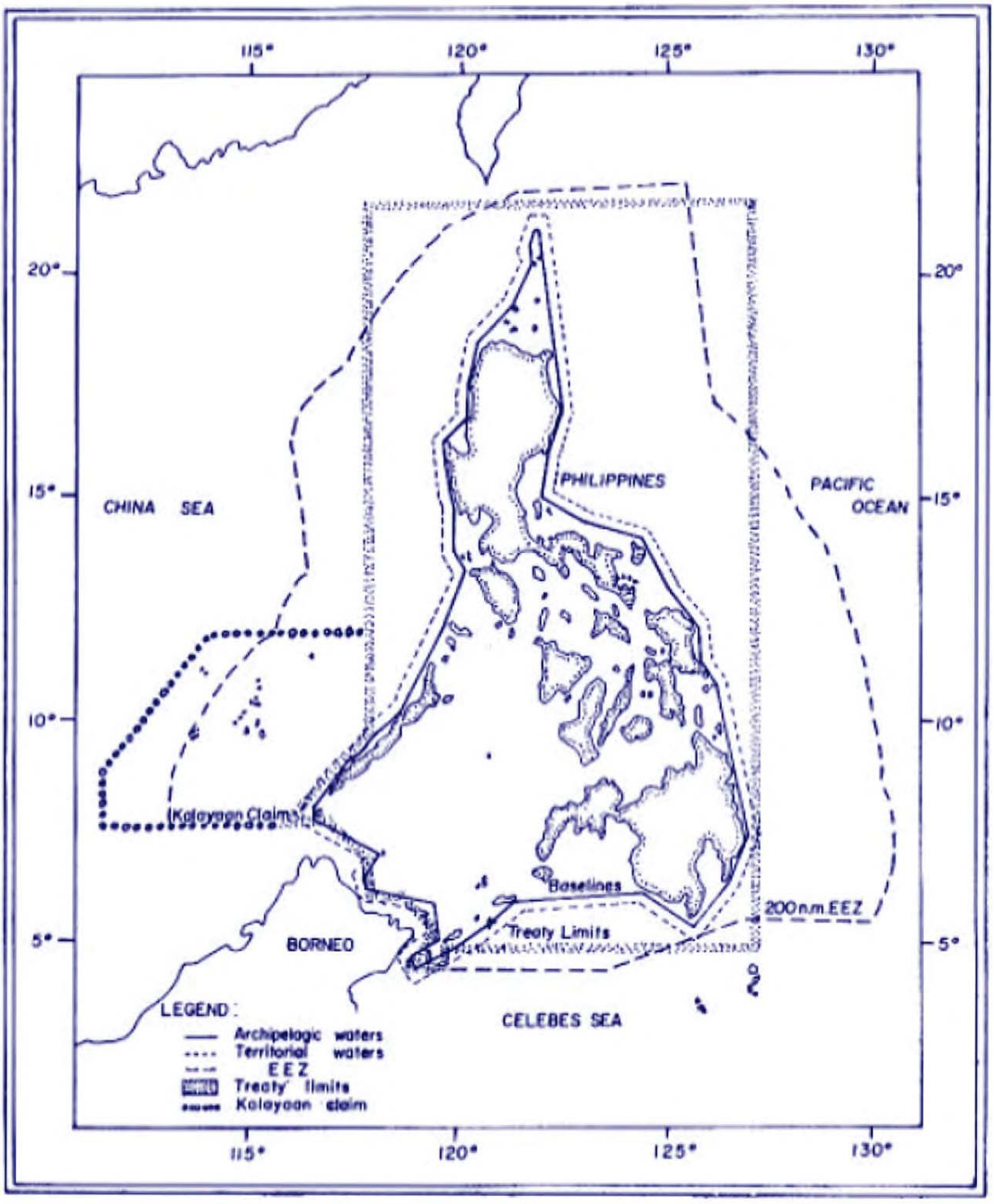

Figure 1. Map of the Philippines showing the limits of archipelagic, territorial waters treaty limits Exclusive Economic Zone (200 N.M. EEZ) and Kalayaan claim.

The Bureau of Fisheries and Aquatic Resources (BFAR) of the Department of Agriculture (DA) is the government agency mandated to ensure the development, management and conservation of the country's fisheries and aquatic resources. It is also committed to (a) contribute in achieving food security for the Filipino people and improve quality of life of fisherfolks through rational and equitable utilization of fisheries and aquatic resources; (b) empower fisheries stakeholders enabling them to adapt to changing environmental conditions and global trade and regional fisheries management regimes; and (c) improve productivity of fisheries and aquaculture within ecological limits. Therefore, one of the strategies to realize these missions is the implementation of the Philippine National Aquasilviculture Program (PNAP), a fishery livelihood and conservation program. The PNAP is a banner program of DA-BFAR jointly undertaken with the Commission on Higher Education (CHED) through a Memorandum of Agreement (MOA) signed on December 16, 2012. The program covers the 15 coastal regions of the country. The participating agencies include the BFAR, with its Regional and Provincial Fishery Offices; CHED, and its participating State Universities and Colleges (SUCs); the Department of Natural Resources (DENR), with its Provincial Environment and Natural Resources Offices (PENRO) and Community Environment and Natural Resources Offices (CENRO); and the Local Government Units (LGU). The fisherfolks are the primary beneficiaries of the resource rehabilitation and protection and aquasilviculture projects while the participating SUCs are the beneficiaries of the community-based multi-species hatcheries.

The Program

The concept of PNAP is to come up with self-sufficient fisherfolk families who are advocates of fisheries resource protection through mangrove habitat rehabilitation, promotion of aquasilviculture and the establishment of community-based multi-species hatcheries that will produce fry for restocking in natural waters.

The PNAP has three (3) components, namely: (1) mangrove resource rehabilitation and protection; (2) provision of aquasilviculture livelihood projects and (3) establishment of community-based multi-species hatcheries (CBMSH). The projects are being implemented under the guidance of the BFAR-National Brackishwater Fisheries Technology Center (NBFTC) in Pagbilao, Quezon that serves as the National Program Secretariat, with assistance from resource persons and technical consultants from BFAR, DENR-Forest Management Bureau (FMB) and Protected Areas and Wildlife Bureau (PAWB).

1. Mangrove resource rehabilitation and protection

Mangroves are valuable sources of forest products and aquatic resources. Both offshore and inshore fisheries depend on mangroves as natural habitats. Melana and Courtney (2000) reported that parallel with the decline in the mangrove areas of the Philippines is the significant reduction of fishery resources. The loss of mangrove forests in the Philippines is also correlated with decreasing fisheries production in municipal waters and the depletion of larval and juvenile stages of shrimps and milkfish which are seed sources for pond aquaculture (Camacho and Malig 1988 as cited in ADB 1990).

In 1918, Brown and Fischer estimated the mangrove forest to be as much as 400,000 – 500,000 ha. However, the mangrove areas were indiscriminately alienated for other uses such as conversion to fishponds during the 1960s and 1970s, reclamation for residential and industrial development, over-harvesting of mangrove trees for charcoal or fuel wood and urbanization. In 1994-1995, mangrove forest was estimated at 120,000 ha (Primavera and Esteban, 2008). Long and Giri (2011) conducted the latest study on the aerial extent and spatial distribution of Philippines' mangrove forest. They estimated that the total area of mangrove forest of the Philippines was 256,185 ha circa 2000.

The rapid decline of mangrove forest is alarming considering the ill effects that may be brought about by climate change in archipelagic countries, like the Philippines, with little mangrove cover. Thus, restoration of mangrove forest is essential to mitigate or build the country's resiliency to climate change. To achieve this, BFAR has targeted to plant 100 M mangrove trees in 3-4 years to bring back health to its degraded coastal cover. Potential areas targeted by the PNAP are abandoned, undeveloped and underutilized (AUUs) fishpond lease agreements (FLAs) and the DENR identified areas (key biodiversity areas, reforestation areas and co-management agreement areas) from BFAR coastal regions 1 to 13 and ARMM. Participating agencies are DA-BFAR Regional Fisheries Offices (RFOs) and Provincial Fisheries Offices (PFOs), CHED (SUCs), DENR Provincial Environment and Natural Resources Offices (PENRO) and Community Environment and Natural Resources Offices (CENRO), and the Local Government Units (LGUs) in the provinces and municipalities. The coastal fisherfolks will be encouraged to collect, plant and nurture mangrove propagules. As an incentive, a farmer will be paid P 1.50 for every propagule collected, P 2.00 for every propagule planted and P 2.50 for every fully-grown plant. With this management scheme more coastal fisherfolks will participate and will be motivated to nurture and protect each propagule planted.

2. Aquasilviculture

Aquasilviculture is a multi-purpose production system that allows production of fish in a mangrove reforestation project. It is a mangrove-friendly aquaculture technique of producing fish in a watered area enclosed with net but does not allow cutting of mangrove trees. A model of aquasilviculture is showcased at the BFAR-NBFTC Pagbilao, Quezon. The design for the project follows a 70:30 ratio of mangrove to water canal area. This system provides a source of additional income and at the same time increases fish production that is easily adaptable for municipal/artisanal fisherfolks. The fisherfolk-beneficiary who participated in the resource rehabilitation activity shall be the primary beneficiary of the aquasilviculture project. The BFAR shall provide P 65,000 for each aquasilviculture project of fisherfolk beneficiary as input assistance in the form of fry/fingerlings, supplemental feed and nets. Target beneficiaries for aquasilviculture livelihood projects are at least 1,000 coastal fisherfolk.

3. Establishment of community-based multi-species hatchery

The community-based multi-species hatchery (CBMSH) is a facility for spawning gravid fish or crustacean, such as blue crab, caught in the wild to save its offspring that

might otherwise be lost due to misuse. The hatchery will produce the fry for stock enhancement and eventually become source of fingerlings and seed stock for aquasilviculture and other aquaculture projects. Moreover, the CBMSH will serve as a working laboratory of fisheries students of the participating State Universities and Colleges. CBMSH may be land-based or holding cages ("lying-in") for gravid, ready to spawn crabs. Funding support from BFAR is P 1.2 million per SUC for the establishment and operation of CBMSH. Target beneficiaries for the CBMSH are 64 SUCs who were signatories to the MOA.

Figure 2. Four-hectare aquasilviculture model at BFAR-NBFTC Pagbilao, Quezon.

Strategies

Implementing Guidelines

A comprehensive implementing guideline was prepared and approved by the National Steering Committee (NSC) to ensure the success of the implementation of the PNAP. It defined the organizational structure and strategies of implementation of the program.

The NSC was created to provide over-all policy directions and guidelines. The convenors of the NSC are the DA Secretary and CHED Chairperson; Co-chaired by the BFAR Director and CHED Commissioner; and members composed of 3 BFAR Regional Directors and 3 SUC Presidents representing Luzon, Visayas and Mindanao; BFAR-Assistant Director; DENR-FMB Director and PAWB Director. The activities of the NSC are being managed and coordinated by the BFAR-NBFTC-based National Program Secretariat.

At the regional level, a Regional Steering Committee (RSC) was created to supervise policy implementation and oversee the Program Management Office (PMO). It is composed of the BFAR Regional Director and SUC Presidents. The PMO was also created to oversee the operations and implementation of the program in the province. The BFAR Provincial Fisheries Officer (PFO) heads the PMO as over-all Project Coordinator. The members of the PMO are the authorized representative of the SUC President, PENRO and the Provincial Agriculturist. In addition, the PMO engaged the services of a Community Organizer (CO) who directly implements the program in the field.

Capacity Building

BFAR and SUC coordinators, PFOs, focal persons, COs and fisherfolk beneficiaries were given technical training on the three components (mangrove resource rehabilitation and protection, aquasilviculture and CBMSH) as well as constituency building, value formation and leadership development. Training of implementers was done at BFAR-NBFTC while that of the beneficiaries was done at the BFAR Regional Fisheries Training Centers (RFTCs). CBMSH training was done at BFAR Guiuan Station in Guiuan, Samar. Resource persons from BFAR,

DENR, the private sector and non-government organizations were invited to discuss specific subjects relating to their line of expertise.

Participation of other Relevant Government Agencies

The NSC and RSCs may enter into agreements and partnerships with other relevant national, regional and local government agencies in the implementation of the program. Such agreements and partnerships may cover: (a) joint funding and counter-parting; (b) conduct of training and technology transfer; (c) research, development and extension; (d) market development and credit facilitation; and (e) other relevant support for the implementation of the program.

Status of Implementation

The PNAP is in its third year (FY 2014) of implementation. Technical training has been completed for all components. Mangrove rehabilitation has started in FY 2012 and still continuing (Figure 3). Report of mangrove propagule planting as of September 2013 indicated that around 31,000,000 out of 36,000,000 target for the year has been planted (85% accomplished) covering more or less 10,000 ha throughout the country. Almost 32,000 fisherfolk participated in the activity. For aquasilviculture, 76% has been attained benefitting almost 1,900 fisherfolk throughout the country (Figure 4). For CBMSH, almost 20% of participating SUCs had completed establishment, while still continuing for the others (Figure 5).

Figure 3. Planted *Rhizophora* in various sites.

Figure 4. Aquasilviculture pond stocked with mangrove crabs.

Figure 5. Community-based multi-species hatcheries (CBMSH) established by SUCs.

Future Interventions

The government is committed to achieve food security for the Filipino people, increase fish production and improve standard of living of coastal fisherfolks. Therefore, there should be continuing rehabilitation of denuded mangrove areas, particularly AUUs and make the coastal fisherfolks sustainably productive through aquasilviculture. Mangrove areas reported as rehabilitated should be validated and assessed in terms of surviving propagules planted, as well as to the extent of cover. Fisherfolk communities should be continuously organized and empowered through training and information dissemination to conserve and protect mangrove areas. Stock assessment studies should be conducted in areas with established CBMSH to determine if there is improvement in catch of fisheries products.

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