STATUS OF MANGROVES AND MANGROVE MANAGEMENT IN THE PHILIPPINES

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The development of coastal resources in the Philippines in the early part of the 20th century has primarily been exploitative in nature. Mangroves, in particular, were viewed more as a commodity because of its value for firewood and tanbarks. From its original area of approximately 450,000 ha in 1918, it was drastically reduced to a range of 140,000 to 120,000 ha from 1991 to 1994 (Long & Giri 2011). Reasons cited were many such as logging for firewood and tanbarks and the conversion of mangroves to fishponds for milkfish and prawn culture. In the 1950s, mangrove firewood was the preferred fuel source in coastal villages and most bakeries because of its high heating value. But a greater volume was exported to Japan as firewood, which reportedly became the source of rayon. In the 1960s, the government adopted a policy aimed at increasing fish production by converting large areas of mangroves into fishponds for the culture of milkfish and prawns. Such policy was promoted by a government program, which classified and released mangrove timberland for fishpond development and opened loan windows in most government banks to finance fishpond development.

It was in the 1970s when the government realized the importance of mangroves as an ecosystem during which a National Mangrove Committee (NMC) was created in 1976 under the Ministry of Natural Resources. The NMC is a policy-making body for the conservation and sustainable management of the remaining mangrove forests in the country. At the same period, the Mangrove Forest Research Center (MFRC) was created under the Forest Research Institute (FORI) that was reorganized as the Ecosystems Research Development Bureau (ERDB) in 1987. During that time, the NMC was integrated to ERDB.

The Department of Environment and Natural Resources (DENR) has jurisdiction over mangrove resources as provided for in PD 705 (1975) or the Forestry Code of the Philippines. As such, all mangrove swamps set aside for coastal protection purposes shall not be subject to clear-cutting operation. Issuances enacted pursuant to PD 705 include: DAO 76, s1987 (establishment of buffer zones in mangrove areas); DAO 15, s1990 (mangrove conversion and conservation); and DAO 96-29, s1990 (awarding of mangrove stewardship contract). Notable government programs to promote mangrove rehabilitation and conservation in the country include:

1. The ADB - Fisheries Sector Program (1990–1994) was designed as the initial phase of the systematic government efforts to rehabilitate the country's coastal zone, reduce the extensive poverty prevalent among fisherfolk, and enhance sector productivity. Under the program, the DENR targetted the rehabilitation of 30,000 ha of mangrove forests within the identified priority bays, namely: Manila Bay, Calauag Bay, Lagonoy Gulf, San Miguel Bay, Tayabas Bay, Ragay Gulf, Sorsogon Bay, Carigara Bay, San Pedro Bay, Ormoc Bay, Sogod Bay, and Panguil Bay. The Department of Agriculture (DA) was the executing agency.
2. The Coastal Environment Program (CEP) was established in 1993 through DAO No. 19 by Secretary Angel C. Alcala through Executive Order No. 192 and Republic Act 7586. This program mandated the DENR to implement programs and projects on conservation and management of Philippine coastal environment and promote the use of environment-friendly coastal technologies; expand livelihood opportunities in, and assure equal access to, coastal resource; and upgrade the capabilities of all DENR personnel in the management of coastal environments.
3. The Coastal Resource Management Project (CRMP) based in Cebu City was also implemented in 1996 for the mangrove management and restoration along 3,000 km of shoreline which covered 16,000 ha of mangroves.
4. The Community–based Forest Management Agreement (CBFMA), EO 263 s1995 and its IRR as outlined in DAO 96-29 provided tenurial instrument available for communities who wish to manage their mangrove resources. The CBFMA integrates all other forms of tenurial instruments developed by the DENR including the Mangrove Stewardship Agreement (MSA) and the Community Forest Management Agreement (CFMA).

5. The ADB's support to the implementation of the Integrated Coastal and Resource Management Program (ICRMP) is viewed as a crucial step to assist the government in addressing critical issues for sustainable management of the marine and coastal resources and increase the income of rural communities. Technical assistance was provided to participating LGUs to develop and adopt municipal ICRM plans that shall guide local development initiatives towards sustainable management of coastal resources

The catastrophic impacts of Typhoon Yolanda in the Philippines in November 2013 has prompted the need to rehabilitate and restore mangroves as a primary line of defense against coastal perturbations such as typhoons, tsunamis, and storm surges. With the combined impacts of other typhoons immediately prior to Yolanda, the 7.2 magnitude earthquake in Cebu and Bohol, and the man-made damages wrought by the fighting forces during the siege in Zamboanga Sibugay, the Philippine Government has allocated a Php 1 billion budget for the DENR to specifically implement the Mangrove and Beach Forest Development Project (MBFDP). The project is pursuant to the special provision of FY 2014 General Appropriation Act (RA 10633) under the Section XIV (Reconstruction and Rehabilitation Program).

The ERDB was designated as the overall coordinator of the MBFDP and the PENROs and CENROs as field implementing units. Science-based rehabilitation and lessons from the failures of reforestation in the past are carefully integrated in the implementation of the project. Salient features of the project are:

1. Importance of mapping and baseline data collection on bio-physical characteristics of target sites as bases for future impact assessments;
2. Implementation of cash-for-work scheme in the different stages of plantation development including nursery establishment;
3. Incorporation of capacity-building and sustainability mechanism strategies;
4. Distinct target sites from that of regular NGP-mangrove;
5. Emphasis on sustainability which necessitates the extension of project life beyond 2015; and
6. Strong monitoring and evaluation system.

Considering the time limitation in project implementation as imposed by the government fiscal requirements and procedure, the MBFDP presents itself as a strategy to rehabilitate and/or restore 50,000 ha of mangroves and beach forest in 10 regions (4a, 4b, 5, 6, 7, 8, 9, 10, 11, and 13) to generate jobs and provide additional income for coastal communities. The project also hopes to correct unscientific strategies that were used in the past mangrove rehabilitation projects and capacitate the communities in various activities related to MBFDP. At least five ERDB techno-bulletins pertaining to site selection and validation, baseline data collection, mangrove nursery establishment, plantation development, maintenance and protection and beach forest development were issued (**Appendix H**). The importance of baseline assessment of the bio-physical characteristics of the representative planting sites per province has also been emphasized for use in future impact assessment.

Actual planting started in early 2015 and the succeeding two years (2016–2017) are intended for maintenance and protection. In all these years, a science-based monitoring and evaluation shall be undertaken by ERDB to document the lessons learned that can help improve and/or re-shape mangrove rehabilitation in the future. The timing of availability of planting materials has also been emphasized. Extreme and unpredictable climatic events are also anticipated to draw adverse impacts on established plantations. Part of the sustainability mechanism at hand is to encourage the community to replant the damaged sites.

The need to rehabilitate such a huge area is a gargantuan task, more so that mangrove planting is currently being undertaken by many entities such as the DENR, the DA through the Bureau of Fisheries and Aquatic Resources (BFAR), the LGUs, and the NGOs. The DENR has clear jurisdiction over mangrove resources. Given this mandate, all activities related to mangrove rehabilitation and management should be regulated by the DENR, particularly the identification of planting sites. Nevertheless, the convergence of all these government and non-government entities is needed in pursuit of the common goal of rehabilitating our mangroves. Such mangrove rehabilitation will strike the balance between coastal environment protection and food production and security, which epitomizes the coastal resiliency goal of the MBFDP.