

# Managing Mangrove Conservation Projects: Best Practices and Lessons Learned

**F**orest Foundation Philippines has supported numerous mangrove conservation projects in the Philippines. This generated important lessons and developed best practices for mangrove conservation efforts. Below are some of the lessons and practices the Foundation hopes to impart to the greater public.

## SCIENCE-BASED INTERVENTIONS

Mangrove conservation must be guided by the following science-based considerations that help determine appropriate sites and species for planting.

### Area Factors

- Areas naturally covered with mangroves must be prioritized for restoration, while remaining mangroves must be protected.
- The restoration site's tidal zone and substrate determines the species to be planted.
- Mangrove areas converted to aquaculture ponds that are now abandoned or underutilized must be reverted back to mangroves.
- Non-mangrove seaward areas, especially seagrass beds, should not be planted.
- Mangrove plantations in seaward areas are prone to mortality due to wave actions, presence of debris, and barnacle infestations.

### Species Considerations

- When restoring seaward mangrove areas with barnacle infestation, *Sonneratia* species (e.g. Pagatpat) must be planted. Its regular bark shedding results in the natural removal of the barnacles.
- In areas where *Sonneratia* species (e.g. Pagatpat) or *Avicennia* species (e.g. Miapi) dominates, planting of *Rhizophora* species (e.g. Bakawan) is discouraged, as it will have higher mortality.



Photo: Miriam College Environmental Studies Institute

*Mangroves mapping is necessary to ensure site suitability. This provides baseline information, priority areas for restoration and protection, and basis for management planning and zoning. This also serves as reference for quantifying impacts after project implementation.*

## SITE-SPECIES SUITABILITY

Location/ Zonation	Substrate	Appropriate Species
Downstream/ estuaries	muddy	<i>Sonneratia alba</i> (Pagatpat)
Seaward	muddy	<i>Sonneratia alba</i> (Pagatpat)
Seaward	sandy/coralline	<i>Avicennia</i> , <i>Rhizophora stylosa</i>
Landward	muddy	<i>Rhizophora</i>
Upstream	muddy	<i>Nypa</i>

## MANGROVE NURSERY MANAGEMENT

Nurseries are the production and nurturing areas for seedlings prior to proper planting. Seedlings usually require at least four months in the nursery to ensure the desired quantity and quality. The nurseries can also determine the availability of suitable species. Considerations and learnings for managing nurseries include:

Protective nets or fences are necessary, as the quality of seedlings significantly affects their survival and growth once planted.

Nurseries are established in areas reached by water during high tide to avoid wave action. This eliminates the need for labor-intensive watering.

Small-sized mangrove seeds are initially propagated in seedbeds, then transferred to containers. Bigger seeds and propagules can be planted directly in containers.

If there is a limited area for land-based nurseries, floating nurseries are established using bamboo poles as rafts.

In case of pest infestation, the seedbeds and potted seedlings can be elevated.



Nurseries can also serve as a community enterprise. In Lian, Batangas, the Lian Kingfisher Association sells seedlings at PhP 15 each to students, civic organizations, and other groups interested in mangrove planting. The income is shared between the association and seedling owners.

## ADDRESSING ECONOMIC NEEDS

Any conservation effort must be linked to the economic needs of the people, especially those directly dependent on the mangrove forest. Mangroves also serve as nurseries, breeding grounds, and habitat for marine life and other resources fisherfolks can gather for sustenance or sale. This is why the Foundation supported the creation of additional sources of income consistent with mangrove conservation. In Zamboanga Sibugay, for example, the Foundation supported the culture of oyster, lapu-lapu, and mud crab. This contributed to food availability and served as an additional income source for the area's communities. This is being expanded, replicated, and scaled up to other coastal communities as an incentive for enhanced mangrove conservation.

## BIODIVERSITY CONSERVATION

Mangroves are habitats of diverse flora and fauna. Restoration and protection efforts ensure the regeneration of mangrove biodiversity. In one of the mangrove conservation sites in Siay, Zamboanga Sibugay, the population of flying foxes in Kabog Island significantly increased when the mangrove forests were protected.

## SUSTAINABLE COMMUNITY PARTICIPATION AND STEWARDSHIP

Community participation is crucial to ensuring stewardship and sustainability of any mangrove conservation effort, thus communities must be engaged as partners and not just project beneficiaries.

### Conservation efforts must include:

1. Community engagement, capacity building, and advocacies to transform the people as stewards of the mangroves and other coastal resources
2. Sustained monitoring and protection beyond the project duration
3. Provision of initial incentives for the community while waiting for long-term support from mandated agencies
4. Designated areas for community utilization and harvesting, with permission and approval from the organization managing the resources
5. Effective leaders who champion mangrove conservation

## TENURE AND INSTITUTIONALIZATION

Tenure is crucial to natural resource management. Zamboanga Sibugay has entered into a co-management agreement for the management of mangrove areas in the municipality. With the co-management agreement in place, which serves as legal basis, the LGU partnered with the fisherfolk association living near the mangrove areas to implement mangrove conservation efforts.

## ALTERNATIVE MATERIALS

Coastal communities source many materials from mangrove forests. This includes fuel and building materials for housing and fishing infrastructures. Without sustainable sources of materials, increasing human settlements in coastal areas will threaten mangrove forests.

Bamboo is an alternative material, but the declining quantities of naturally growing bamboo has increased its price. Thus, the Foundation also supports bamboo propagation and planting. Bamboo cuttings are planted along river banks or intercropped with existing coconut farms, while woodlots with fast-growing tree species are established in private lands.

## PARTNERSHIPS AND NETWORKING

The Foundation's support is limited to forest conservation, thus necessitating partnerships with other funding organizations to address other needs. For example, the success of the mangrove conservation efforts of Foundation partner organization Kapunungan sa Gagmay'ng Mangingisda sa Concepcion (KGMC) enabled them to partner with other organizations to address community concerns, such as education, health, enhancement and expansion of enterprises, support for infrastructure, and continued capacity building.

## CHALLENGES AHEAD

The Foundation's mangrove conservation efforts are largely successful, thanks to the above lessons and practices, but threats and challenges requiring broader interventions still persist. The impacts of climate change are now felt, affecting not just people's lives and properties, but also the natural environment.

- **Siltation** - Mangroves help in managing siltation, but excessive siltation that is beyond the mangroves' adaptation capacity may result in its death. Mangroves in the estuaries and community aqua-culture enterprises are especially prone to this. Land conversion, combined with the lack of soil and water conservation, also contribute to siltation. Mangrove conservation must be complemented by forest conservation and sustainable farming to address this risk.
- **Increasing Human Population** - The bigger the population, the greater the pressure on natural resources. In Barangay Concepcion in Zamboanga Sibugay, the improvement of mangrove forests resulted in the increased population of fish, shells, and shrimps, which attracted former barangay residents to re-establish residency.
- **Tree Planting for Publicity** - Tree planting is the most common environmental conservation activity, but a number of the popular, large-scale activities have been ineffective and unsuccessful. To ensure a tree planting project contributes to conservation, it must be designed properly and complemented by at least three years of maintenance and protection.
- **Natural Calamities** - Natural calamities, like typhoons, are predicted to become stronger due to climate change. As demonstrated when Super Typhoon Yolanda struck Samar and Leyte, mangroves protect land areas from these calamities, but they suffer the brunt of the destruction.

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