



Mangroves for the Future
INVESTING IN COASTAL ECOSYSTEMS

A Regional Synthesis of Results and Lessons from Mangroves for the Future Small Grant Projects: 2009–11



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Abbreviations

ABTA	Arugam Bay Tourism Association
ACBG	Aldabra Children's Book Group
AEC	Atoll Ecosystems Conservation Project
ASF	Artisanal Shark Fishers
ASFA	Artisanal Shark Fishers' Association
BOBLME	Bay of Bengal Large Marine Ecosystem Project
CBDRM-NU	Community-Based Disaster Risk Management – Nahdlatul Ulama
CBO	Community-based organization
CEGA	Community-Based Eco-guide Association
CFL	Compact Fluorescent Light
CSR	Corporate Social Responsibility
DMCR	Department of Marine and Coastal Resources
DOE	Department of Environment
DS	Divisional Secretariat
ECO-CEN	Ecocare Centre for Environmental Education and Conservation
EDC	Eco-Development Committee
EPTRI	Environment Protection Training and Research Institute
FAO	Food and Agriculture Organization of the United Nations
FD	Forest Department
FPC	Forest Protection Committee
GCE	General Certificate of Education
GEER	Gujarat Ecological Education and Research Foundation
GEF	Global Environment Facility
GIF	Green Islands Foundation
GIFT	Genetically improved farmed tilapia
GTZ	German Technical Cooperation
HELP-O	Human & Environment Links Progressive Organization
ILHAAR	Illustrious Happening of Arts
IMFFS	Integrated Mangrove Fishery Farming System
IPPM	Community Research and Development Institution of Makassar
IUCN	International Union for the Conservation of Nature
JFM	Joint Forest Management
JGM	Jakarta Green Monster
JMM	Joint Mangrove Management
LDDFA	Livestock Development Dairy Farmer Association
LED	Light Emitting Diode
LKR	Sri Lankan Rupee
LULC	Land Use/Land Cover
MANDRU	Institute for Alternative Development and Regional Cooperation
MCRCF	Marine and Coastal Resources Conservation Foundation
MCSS	Marine Conservation Society Seychelles
MDF	Maduganga Development Foundation
MFF	Mangroves for the Future
MoEF	Ministry of Environment and Forests
MPCC	Multi-Purpose Community Centre
NAQDA	National Aquaculture Development Authority

NCB	National Coordinating Body (of MFF)
NEUF	National Ethnic Unity Foundation
NGO	Non-governmental organization
NIO	National Institute of Oceanography
NPOA	National Plan of Action for the Conservation and Management of Sharks
NSAP	National Strategy and Action Plan (of MFF)
OPED	Organization for Protecting and Ensuring Democracy
PEARLS	Peaceful Environment Assured Right Lasting Solutions
POW	Programme of Work (of MFF)
RDC	Ruhunu Development Consortium
RSC	Regional Steering Committee (of MFF)
RUK	Rekawa, Ussangoda and Kalametiya
S4S	Sustainability for Seychelles
SBC	Seychelles Broadcasting Corporation
SDMRI	Suganthi Devadason Marine Research Institute
SEEDO	Social, Economic and Environmental Development Organization
SGF	Small Grants Facility (of MFF)
SIF	Seychelles Islands Foundation
SSA	Seychelles Scouts Association
TCSR	Tata Chemicals Society for Rural Development
TRASS	Terrestrial Restoration Action Society Seychelles
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
VFC	Village Forest Council
WCS	Wildlife Clubs of Seychelles

Foreword

This regional synthesis of results and lessons has been compiled to share the efforts undertaken by coastal managers and local communities under the Mangroves for the Future (MFF) Small Grants Facility between 2009 and 2011. It aims to capture the coastal issues they sought to address, the actions they took, the challenges they faced, and the successes they achieved. We hope that by sharing these experiences, other coastal stakeholders in Asia and around the world will benefit from their efforts, learn from their experiences, and use the solutions they have developed to build a more prosperous and resilient future for all coastal communities.

MFF thanks Terry Clayton and his team, who sifted through a large volume of information and consulted extensively with national coordinators to compile this review. MFF also acknowledges the efforts of its senior advisor, Don Macintosh, who provided much assistance in developing this review.

MFF administered its first round of small grants from 2009 to 2011. It is currently administering a second round from 2012 to 2014. The small grant projects are integral to MFF as they achieve direct, tangible results in coastal areas. They are guided by MFF's National Coordinating Body in each country to ensure their relevance to national priorities. They also are used to address common coastal issues at a regional level by providing a venue to explore new ideas and solutions that can be scaled-up or replicated by others. Other small grant projects build on

previous or existing coastal initiatives, contributing to wider results. The Small Grants Facility is complemented by medium, large and regional grant facilities which allow MFF to address coastal issues at multiple scales and through a range of modalities.

MFF would like to thank the thousands of coastal community members and other stakeholders who have participated in the small grant projects to date. Without their care and concern for their coastal environment, few positive long-term changes could have been achieved. We also acknowledge the hard work and dedication of the organizations that have implemented small grant projects, and their valued role as MFF partners in coastal ecosystems management.

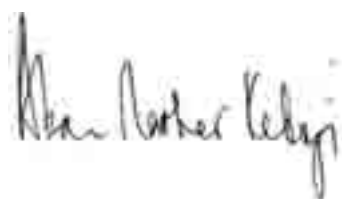
MFF would also like to acknowledge the oversight and guidance provided by the members of its National Coordinating Bodies in India, Indonesia, Maldives, Seychelles, Sri Lanka and Thailand, who implemented the first round of grants, and who have now been joined by Pakistan and Viet Nam in the second round.

Lastly, MFF would like to thank its core institutional partners – UNDP, IUCN, Care International, FAO, UNEP, Wetlands International, Norad and Sida – for their long-term commitment to the initiative. Our funding partners Norad and Sida deserve special acknowledgement and appreciation for their generous support of this work on behalf of the millions of people who inhabit coastal areas, and whose livelihoods and well-being depend on coastal resources.

MFF Co-Chairs



Joseph D'Cruz
UNDP



Aban Marker Kabraji
IUCN

Executive summary

Managing coastal ecosystems sustainably is vital if they are to remain healthy and so continue providing the goods and services that many people depend on for their livelihoods. To this end, the MFF Small Grants Facility (SGF) funded 79 small grant projects in six countries between 2009 and 2011.

All six countries (India, Indonesia, Maldives, Seychelles, Sri Lanka and Thailand) face common pressures and conflicts in their coastal areas. Habitat loss and degradation, coastal erosion, and the loss of biodiversity and productivity are among the main challenges, and rapid population growth is putting further pressure on vulnerable coastal areas.

Local partners, mainly NGOs and community groups and associations, brought their knowledge, skills and experience to bear to meet numerous challenges in coastal resources management, ranging from purely technical ones to complex social, economic and political issues. Valuable lessons have been recorded for the benefit of future projects and programmes, for example on the strengths and weakness of small grants as a funding mechanism.

Collectively, the 79 SGF Phase 1 projects contributed to rehabilitating thousands of hectares of mangroves by mobilising people to participate in site demarcation, mangrove replanting, and tending. In the process, local NGOs and community organizations gained invaluable knowledge, contributed a great deal of information to local and national authorities, and improved their capacities for management. The projects have increased awareness of the value of mangrove ecosystems, both within communities and among the local and national agencies responsible for coastal resources management.

Many of the projects launched activities that also had immediate, positive impacts on the livelihoods of poor coastal communities who depend on the goods and services provided by mangroves. Judging from the

information recorded in project reports, the overall outputs have been substantial and their longer-term impacts are expected to be highly beneficial to their target communities:

Rehabilitation and conservation:

- ▶ 12,519 hectares demarcated or brought under protection or management by communities.
- ▶ 234,150 new trees planted (95% mangroves).
- ▶ New areas identified or demarcated for special purposes such as avoiding heavy metal contamination, cultivating marine species, or for nurseries and demonstration plots.

Building capacity:

- ▶ Over 5,000 people participated in awareness-raising programmes.

Livelihoods:

- ▶ Over 700 people were trained in alternative income-generating activities.

Information:

- ▶ Hundreds of publications, brochures, posters, films and multimedia products were produced, many in local languages.
- ▶ Numerous press and media events, as well as training and awareness-raising activities, were arranged, with an emphasis on participation by a wide range of civil society actors.

Perhaps the most important lesson to emerge from the SGF Phase 1 projects concerns the effectiveness of small grants. The SGF offers a proven mechanism for engaging with local groups who are well-positioned to mobilize people around issues of local concern.

The main strength of the SGF is that it puts money in the hands of local NGOs, community-based organizations (CBOs) and other civil society organizations. Small

grants also bring with them a sense of official endorsement and credibility invaluable to proponents seeking co-financing from the private sector, or cooperation with local authorities, or both. Moreover, involvement in an SGF project also offers leverage to local NGOs or CBOs applying for funding from other sources to support post-MFF project activities or other projects.

This synthesis covers the results from the 79 completed SGF projects. Together with the individual project profiles in Part 2, it offers policy makers, coastal management practitioners, community leaders and project staff a wealth of information and lessons to help ensure the success of future projects and other efforts to improve coastal ecosystem management.

Part 1

Regional Synthesis of Results and Lessons

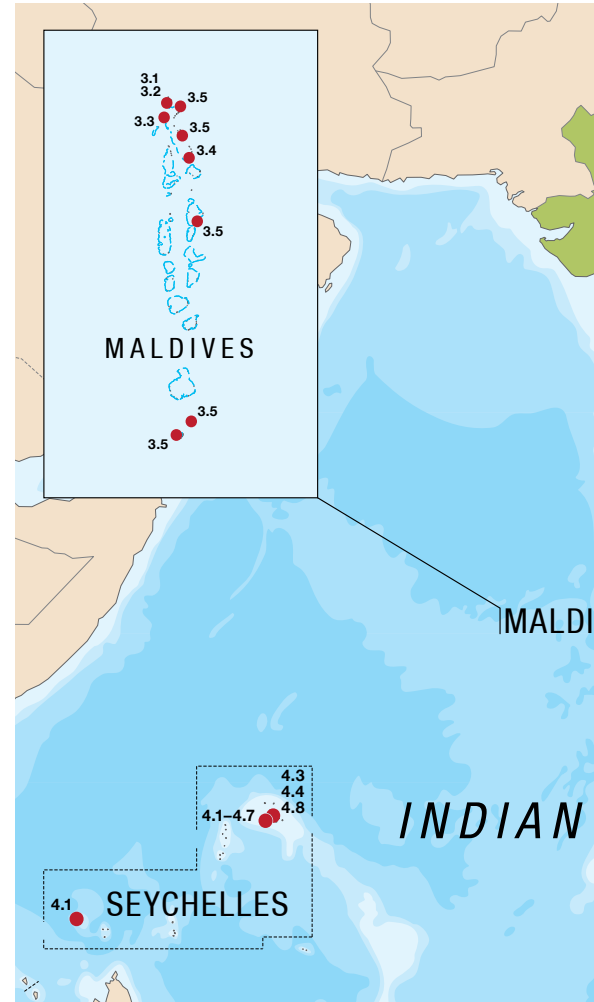
Introduction

Launched in December 2006, the MFF initiative builds on a history of coastal management efforts before and after the 2004 Indian Ocean tsunami, especially the call to sustain the momentum and partnerships generated by the immediate post-tsunami response. MFF's initial focus was on the countries hit hardest by the tsunami: India, Indonesia, Maldives, Seychelles, Sri Lanka and Thailand. It has since expanded to include Pakistan and Viet Nam, and will continue to reach out to other countries in the region facing similar challenges, with the overall aim of promoting a regional approach to integrated coastal resources management.

The MFF initiative seeks to achieve demonstrable results through regional cooperation, national programme support, private sector engagement and community action. Results are being achieved through concerted actions and projects to generate and share knowledge more effectively, empower institutions and civil society, and enhance the governance of coastal ecosystems.

Although MFF has chosen mangroves as its flagship ecosystem, the initiative embraces all coastal ecosystems, including other wetlands, coral reefs, seagrass beds, beaches, estuaries and lagoons. Its management strategy is based on specific national and regional priorities for long-term sustainable management of coastal ecosystems.

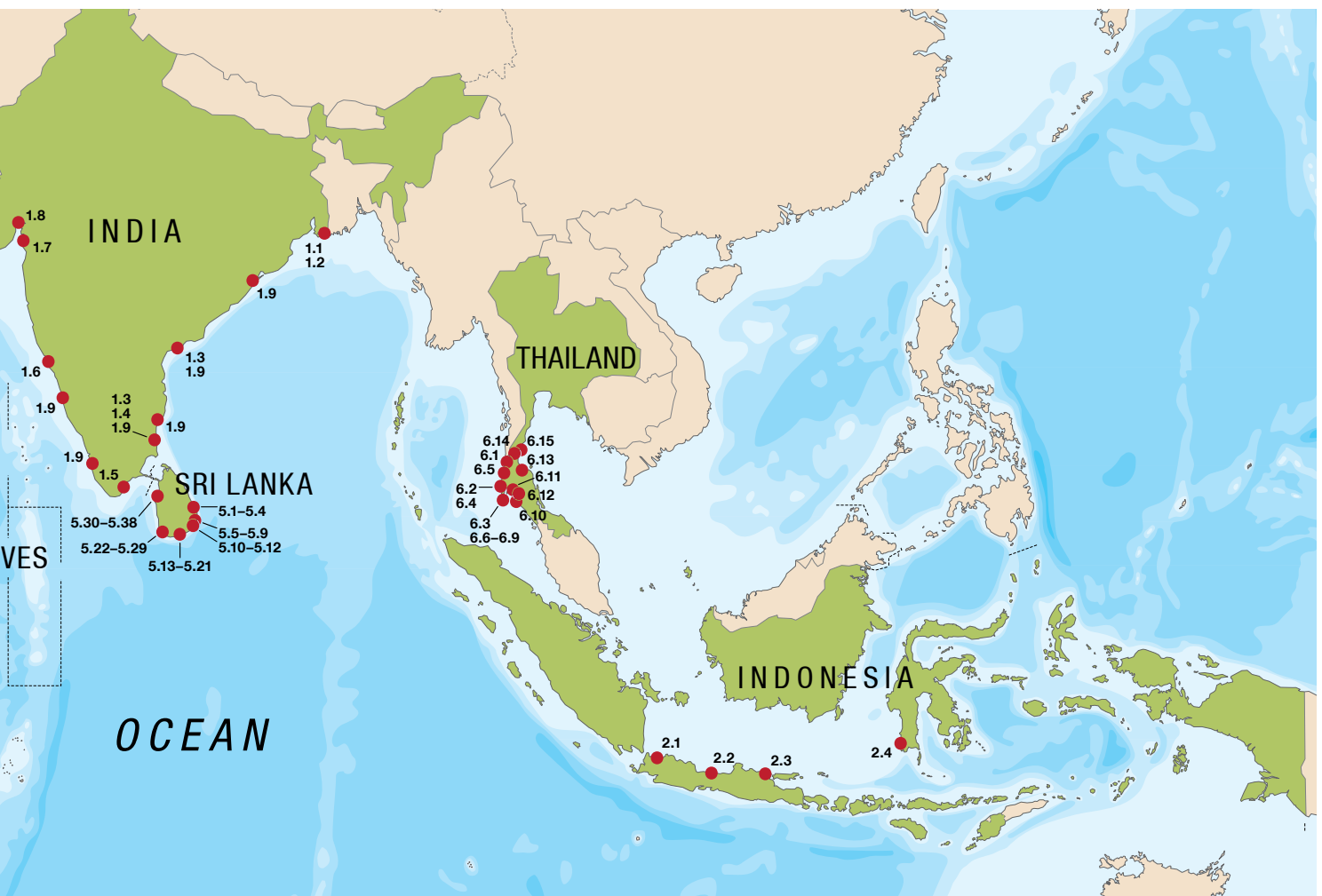
At the regional level, MFF is guided by a Regional Steering Committee (RSC) composed of representatives from its member countries and core institutional partners. The RSC agrees on the strategic direction for MFF and decides on the broad allocation of project resources to member countries. In each country, a National Coordinating Body (NCB) oversees MFF's activities at a national level, including SGF projects, ensuring they are consistent with the national priorities set out in each country's MFF National Strategy and Action Plan (NSAP).



The link between strategy (the NSAP) and action (projects and other activities) is provided by 15 Programmes of Work (POWs) which guide the overall implementation of MFF (see Table 1 below). Each MFF project must address at least one of these POWs, based on the priorities identified in the relevant NSAP.

About the Small Grants Facility

The SGF is a project funding mechanism overseen by the NCB in each MFF member country. It is a key element of MFF's strategy to deliver results from the national to local levels, emphasising community-based action. SGF projects are awarded primarily to organizations working with coastal communities on priorities identified in each country's NSAP.



The SGF was launched in June 2008 with an initial allocation of US\$100,000 for each member country. Grants are limited to 18 months and in Phase 1 were divided into two categories: less than US\$10,000, and between US\$10,000 and US\$25,000.

By the end of 2011, 79 approved projects had been completed. These focused on supporting NGOs and CBOs to meet the needs of coastal communities. Most small projects have contributed to alleviating poverty and empowering communities through the development of sustainable livelihoods. They have also stimulated changes in behaviour that are reducing pressure on natural resources, and at the same time have created new or additional sources of income. The projects have also contributed to improving coastal

governance by supporting integrated coastal management and, in some cases, by influencing relevant national policies.

The MFF Programmes of Work and project selection

To support country-level implementation, the general guidelines for the SGF developed by the MFF Secretariat have been adapted by each member country to better reflect the geographic and thematic priorities identified in their NSAP, especially priorities in relation to the Programmes of Work. This ensures that each country has full ownership of the SGF, since the NCB is able to endorse national SGF guidelines, issue calls for proposals, and select grant-ees based on the best proposals to meet

General location of SGF Phase 1 projects. For details see individual project profiles.

national priorities. The NCBs also oversee SGF projects while they are being implemented and, increasingly, NCB members are becoming involved in project monitoring and knowledge management activities based on project results.

Scope and structure of the synthesis

This synthesis covers 79 SGF projects implemented in India, Indonesia, Maldives, Seychelles, Sri Lanka and Thailand between 2009 and 2011. It is divided into two parts. The first assesses the main points of similar-

ity among the projects, identifying common determinants of success, common challenges, and the prospects for sustainability, replication and scaling-up.

The second part is composed of short profiles of each project, organized by country. Each profile gives information on the problem context and target beneficiaries, the project's objectives, outputs and impacts, the grant value and duration, and primary contact details. This information was derived mainly from project reports provided by the IUCN or UNDP country office responsible for managing the SGF in each MFF country.

Table 1. The 15 MFF Programmes of Work that guide SGF project design and selection.

APPLY KNOWLEDGE	EMPOWER CIVIL SOCIETY	ENHANCE GOVERNANCE
1. Improving knowledge for management	6. Promoting civil society engagement	11. Supporting national coastal programmes
2. Designing sound coastal rehabilitation	7. Building capacity for management	12. Strengthening integrated coastal planning
3. Adopting reef-to-ridge approaches	8. Supporting environmentally sustainable livelihoods	13. Contributing to marine protected areas
4. Integrating economic valuation	9. Improving community resilience	14. Promoting management assessment and monitoring
5. Applying monitoring, learning and evaluation	10. Financing coastal conservation	15. Encouraging sustainable business practices

The regional context

Although MFF's member countries vary widely in terms of their size, demography, biogeography, culture, economy and politics, they enjoy similar benefits from and face similar challenges to coastal resources management. Coastal ecosystems buffer against erosion, filter pollutants, and provide food, shelter and breeding habitats for a wide range of organisms. Coastal regions also provide critical inputs for industrial development, including water and land for shipping and maritime infrastructure; opportunities for economic and recreational activities such as fishing and diving; and raw materials such as salt and sand. As population density and economic activity increase in coastal zones, so the pressures on coastal ecosystems also increase.

The US government's Socioeconomic Data and Applications Center estimates that 40% of the world's population lives within 100 kilometres of a coastline (SEDAC, 2011). In Indonesia, Maldives, Seychelles and Sri Lanka, virtually the entire population can be said to live in coastal areas, whereas one-fifth of India's huge population is estimated to live at or near the coast (do Rosário, 2002). Thailand has the smallest proportion of coastal inhabitants at 18% of its population (Department of Mineral Resources, 2011). Yet this still equates to 12 million people and, moreover, Thailand has invested heavily in coastal infrastructure to accommodate the many millions of tourists attracted to its coastal areas each year. Coastal tourism is also important to the economies of the other MFF countries, especially the Maldives and Seychelles, where it is the main source of foreign exchange. Thus, sustainable tourism, along with sustainable fisheries, provide examples of the national priorities shared by all countries.

In terms of the health of coastal ecosystems, a number of worrying trends can

already be seen. In some areas, intensive fishing has reduced endemic coastal fish stocks by between 70% and 90% in just 30 years (Hongskul, 1999). Half of the world's wetlands were lost in the 20th century, as were half of all mangroves. More than three-quarters of the world's reefs are under threat from fishing, coastal development, pollution, and the thermal stress associated with climate change (Burke *et al.*, 2011). Pollution from industry, agriculture and expanding settlements are degrading the quality of much of the world's fresh water. These problems are particularly acute in island countries, whose coasts often constitute their entire territory (Curran, 2002).

A recent report prepared for the Bay of Bengal Large Marine Ecosystem (BOBLME) Project (Townsend, 2010) highlights the prevalence of poverty among communities dependent on coastal and marine resources. This dependence is frequently identified with particular social or ethnic groups. Coastal and marine areas still have a relatively diverse range of resource niches, creating many opportunities for exploitation. That many of these niches are, or were until recently, open-access or common property resources, has made them particularly important for the poor. However, the low social status of many users of coastal and marine resources also limits their access to political power and representation when their traditional rights to coastal resources are threatened. Compounding their lack of empowerment, those who depend on coastal and marine ecosystems for their livelihoods are influenced by a wide range of policies and policy processes, often in unrelated sectors. The impacts of conflicts between policies in different sectors are often felt most strongly in coastal areas because of the high and multiple development pressures they face.

Project results and lessons

Thematic areas addressed

The following analysis summarizes the main contributions made by the SGF projects according to the POWs they supported. The 79 projects covered by this synthesis contributed to all but one of the 15 POWs. Across the six countries, POWs 1, 2, 6, 8, and 9 emerged as the major focus of project initiatives (see Figure 1). Although it is MFF policy that every project should address at least one of the thematic areas represented by the POWs, many projects were relevant to more than one POW (so the figures below add up to more than 79).

tion (POW 2); Promoting civil society engagement (POW 6); Supporting environmentally sustainable livelihoods (POW 8); and Improving community resilience (POW 9).

Some examples of SGF projects that addressed these priority POWs are provided below.

PROGRAMME OF WORK 1: IMPROVING KNOWLEDGE FOR MANAGEMENT

Fully one-third of the SGF projects made contributions to improving knowledge for coastal resources management. These took

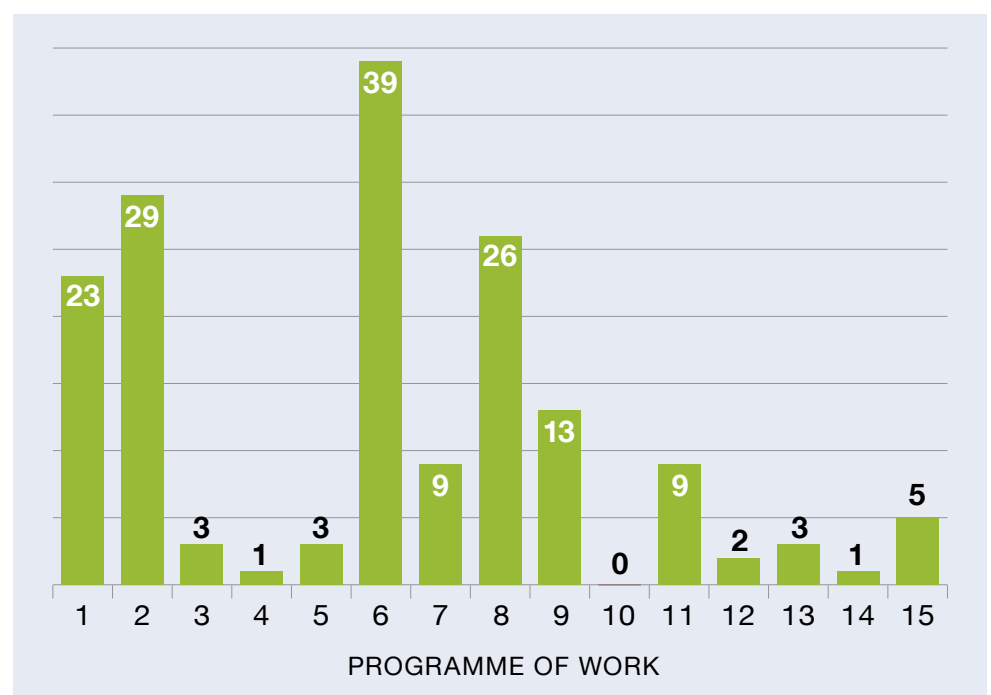


Figure 1. Contribution of SGF projects to MFF POWs.

Three of the six countries (India, Seychelles, Thailand) each implemented projects that collectively addressed all five priority POWs, i.e. the ones that were a major focus of SGF interventions (see Figure 2). The prevalence of these particular POWs in the analysis demonstrates the regional importance of the thematic areas they represent, namely Improving knowledge for management (POW 1); Designing sound coastal rehabilita-

tion (POW 2); Promoting civil society engagement (POW 6); Supporting environmentally sustainable livelihoods (POW 8); and Improving community resilience (POW 9). Various forms, including identification of new species and habitat conservation areas, coastal resources monitoring, and knowledge about important commercial or protected species such as sharks and turtles. Selected examples are presented below to illustrate the wide range of knowledge generated. This was a particular focus of several Indian SGF projects because the country's NCB has identified filling knowledge

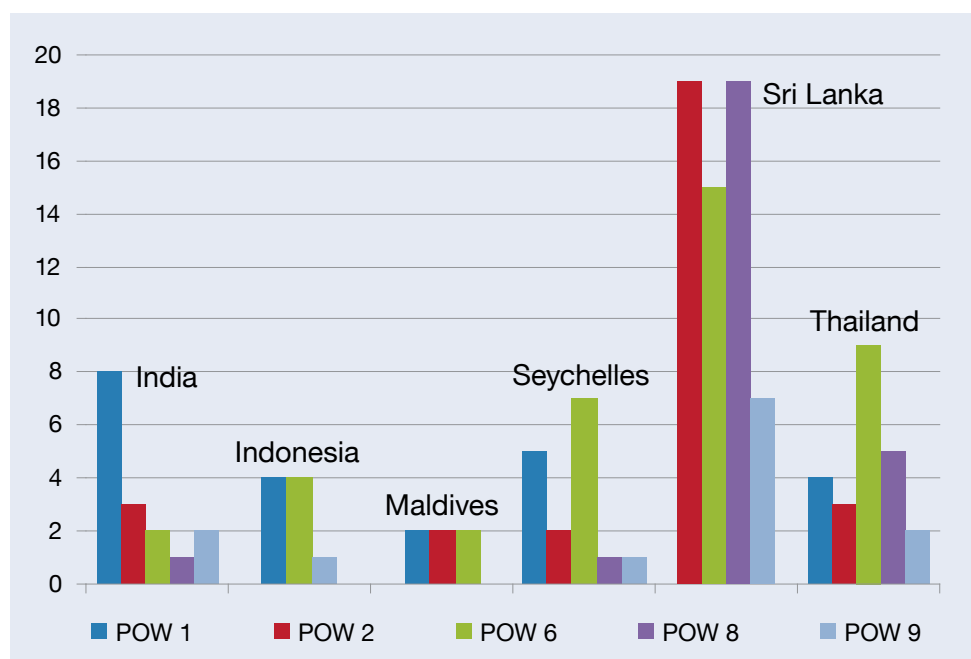


Figure 2. Country contributions to priority MFF POWs.

gaps to support management as a priority for its NSAP.

Discovery of new species and resources; identification of special zones

- ▶ Locally available salt marsh grass (*Porteresia coarctata*) was used as an eco-friendly prawn feed for *Macrobrachium* culture in the Sundarbans, to provide an alternative to commercial feeds made from trash fish and molluscs (India Project 1.2).
- ▶ Safe zones for harvesting edible bivalves were identified by determining trace heavy metal concentrations in commercially important clam (*Paphia malabarica*) and oyster (*Crassostrea gyphoides*) species, thereby protecting consumers from health risks (India Project 1.6).
- ▶ Two species of mangrove believed to be locally extinct in Gujarat were rediscovered (*Bruguiera cylindrica* and *Bruguiera gymnorrhiza*), and the Purna estuary was recommended for designation as a mangrove biodiversity “hotspot” (India Project 1.7).

- ▶ A volunteer conservation group in Siab Yuan fishing village in Chumphon province established mangrove reforestation and rehabilitation zones, a conservation zone for razor clams (*Solen* spp.), and a community aquaculture zone (Thailand Project 6.14).

Compiling information to improve management by local government agencies

- ▶ A comprehensive analysis was made of alternative livelihood activities carried out by the West Bengal Forest Department in 50 villages with Joint Forest Management committees, together with recommendations for improving the relationship between the Forest Department and local people (India Project 1.1).
- ▶ Analysis of the strengths and weaknesses of the mangrove restoration techniques used in Andhra Pradesh and Tamil Nadu, and the institutional issues concerning the roles and responsibilities of the Forest Departments, Joint Mangrove Management committees and Village Forest Councils (India Project 1.3).

- Preparation of a database, maps and comprehensive status report on coastal forest shelterbelts (created by planting mangroves or *Casuarina*) for five southern Indian states and the Union Territory of Pondicherry. This project was designed to help meet the coastal planning needs of India's Ministry of Environment and Forests (India Project 1.9).

Knowledge for managing commercially valuable species supporting local livelihoods

- The nesting success rates of turtles (an important tourist attraction) on beaches in southern Mahé was increased by raising public awareness of the risks to turtles, and by providing training in monitoring and managing key turtle nesting beaches (Seychelles Project 4.2).
- A shark identification key in Creole, the local language of the Seychelles, was prepared to enable artisanal shark fishers to contribute to national efforts to monitor shark catches, and to participate in efforts to ensure sustainable shark fishing practices (Seychelles Project 4.4).
- Households in several villages in Phang Nga province took part in compiling data on mangrove plants and animals, together with local knowledge of edible products from mangroves in the form of mangrove-based food recipes (Thailand Project 6.2).

PROGRAMME OF WORK 2: DESIGNING SOUND COASTAL REHABILITATION

Coastal rehabilitation efforts under POW 2 were directed mainly at rehabilitating degraded or damaged mangrove areas by replanting them with nursery-grown seedlings. Some projects also initiated activities to reduce human impacts on existing coastal resources, and a few tackled coastal erosion.

Rehabilitating coastal habitat; halting erosion

- Fishers living around Batticaloa lagoon grew seedlings of several mangrove species, plus *Hibiscus* and *Cerbera*, which they planted at six sites in the lagoon to help restore the lagoon fishery, the mainstay of their livelihoods (Sri Lanka Project 5.1).
- Bamboo seedlings were propagated by fisher folk living around Rekawa lagoon, then planted either in home gardens as a substitute for the wood used for constructing houses or scaffolding, or along watercourses to reduce soil erosion (Sri Lanka Project 5.13).
- A village mangrove conservation group in Phang Nga province rehabilitated 32 hectares of degraded mangrove forest and established two large areas of mangrove as aquatic habitat protection and community forest zones. Juvenile fish were also released to help rehabilitate the fish stocks that many of the village households depend on for their livelihoods (Thailand Project 6.5).

Reducing human impact on coastal resources

- The harbour, waste management centre, beaches and other public areas on Manadhoo Island were cleared of waste by the island's residents. A household waste management campaign, plus tree planting on an eroded beach site, also contributed to raising the profile of environmental protection and rehabilitation (Maldives Project 3.4).
- A 12m³ biogas unit for producing cooking fuel from organic household waste was installed to help households in Maduganga estuary reduce their dependency on mangrove fuelwood. By consuming household waste, the biogas unit also reduced pollution from the dumping of kitchen waste in the estuary (Sri Lanka Project 5.24).

PROGRAMME OF WORK 6: PROMOTING CIVIL SOCIETY ENGAGEMENT

Many project implementers felt they were “engaging civil society” if people attended training or awareness-raising sessions. Although these activities are valid forms of engagement, they do not guarantee the delivery of project outputs or sustainability of results. Conversely, helping people to form new or strengthen existing associations and networks can contribute to more effective and longer-term engagement. A number of projects were able to achieve this.

- ▶ ECO clubs were set up in Mithapur, Gujarat, involving 2,500 youths in 25 rural schools. Through educational activities, the clubs familiarized children with the issues and opportunities for mangrove conservation. Self-help groups were also established for disadvantaged women, who were given paid work in mangrove nurseries. Beyond the project level, these and other community activities are being supported by a major corporation, Tata Chemicals, through its Society for Rural Development, which will ensure long-term engagement of these groups in the local community (India Project 1.8).
- ▶ An Artisanal Shark Fishers Association was formed and registered to facilitate information sharing and full representation of shark fishers on a national steering committee (Seychelles Project 4.4).
- ▶ An alliance of 365 students, middle-class people and suburban community members was established in Phuket to protect mangroves and mangrove otters as a flagship species (Thailand Project 6.6).

PROGRAMME OF WORK 8: SUPPORTING ENVIRONMENTALLY SUSTAINABLE LIVELIHOODS

Nearly half of the SGF projects undertook some form of livelihood assistance. Liveli-

hood support activities are easy to initiate but difficult to sustain, so they were often conducted in the context of environmentally sustainable activities. Surprisingly, many projects that generated some form of livelihood support did not designate POW 8 as a focus in their project reports, so the proportion of projects contributing to this POW is probably closer to three-quarters. The examples below range from habitat conservation to protect fishery-based livelihoods, to aquaculture and non-fishing alternative income generation. Activities in areas other than fishing were a focus of many Sri Lankan SGF projects; these revealed the need to support marketing, as well as the production side of the activity, when introducing new livelihood opportunities.

- ▶ Collective action was taken to rehabilitate and protect mangroves in Ban Don Bay in southern Thailand to safeguard the livelihoods of small-scale fisher households (Thailand Project 6.13).
- ▶ Six fishermen from two fisher cooperative societies were trained to farm *Eucheuma* seaweed. Although technically successful, the project identified a need for greatly scaling up seaweed production to target export markets. The potential of these markets also needs to be analysed (Sri Lanka Project 5.12).
- ▶ A community-based ecotourism group developed ecotourism facilities at Lunama lagoon, a biodiversity-rich area in Hambantota district. Two camp sites and a birdwatching centre contributed to generating income for villagers as an alternative to environmentally harmful activities (Sri Lanka Project 5.17).
- ▶ Twenty widowed women in Pottuvil gained employment producing broiler chickens as an alternative income-generating activity (Sri Lanka Project 5.8).
- ▶ Fifteen fisher families in Puttalam lagoon, in particular the women, were trained to

cultivate *Aloe vera* as a supplementary source of income. They were also given other help to produce and market this multi-purpose plant (Sri Lanka Projects 5.30 and 5.31).

PROGRAMME OF WORK 9: IMPROVING COMMUNITY RESILIENCE

Building community resilience is a complex challenge requiring improvements to a number of assets: environmental quality, infrastructure, food and livelihood security, health care, social services, education, empowerment and so on. Small grant projects can be expected to make only a modest contribution to resilience by addressing one or two of these elements. Thus, at least two-thirds of the projects counted mangrove replanting, alternative livelihoods, or other relatively simple measures such as ending coastal tree felling (Sri Lanka Project 5.4) towards improving resilience. A project on the tsunami-impacted east coast of India, a project in Java implemented by a community-based disaster risk management group, and another in Seychelles, took a more comprehensive approach, as summarized below.

- Many coastal states in India have introduced coastal shelterbelts to protect against storms and control erosion, and to provide other environmental benefits. These shelterbelts, or “bio-shields”, were mapped and documented to guide state and national government agencies on best practices concerning their use for disaster mitigation and environmental investment (India Project 1.9).
- An Islamic approach to mangrove rehabilitation and disaster risk reduction was adopted in Lamongan, East Java, by involving Islamic leaders, *Pesantren* (religious schools), and community members in mangrove planting and conservation activities. This project demonstrated the effectiveness of

incorporating guidance on mangrove rehabilitation and disaster prevention measures into religious messages delivered by a respected cleric (Indonesia Project 2.3).

- The district of Roche Caiman sits on land reclaimed from the sea, and is considered vulnerable to climate change and natural hazards. The project helped this community to learn about climate change and disaster risk reduction. It also helped the community to identify other environmental needs and future projects (Seychelles Project 4.7).

Social and economic considerations

The previous section gave project examples to illustrate the main thematic areas addressed by the SGF. Similar examples are provided here to highlight the main lessons about the social and economic factors influencing project success. Many of these examples in fact serve to illustrate two or more of these lessons, since the success factors were interrelated and mutually supportive in contributing to positive outcomes.

Working with people: getting involved

About one-fifth of the projects reported on the importance of community involvement, offering two valuable insights into how this can be achieved. Firstly, external recognition, in the form of awards or participation in national events, was shown to be a powerful motivator raising the profile of projects and creating opportunities for wider dissemination of results. Secondly, registering local associations can give people greater capacity to act together, and thereby promote long-term sustainability of project results. Two examples illustrating these lessons are given below.

- The Mitra Bahari Farmers Group in central Java implemented a project to plant man-

groves and demonstrate best practices for mangrove aquaculture and goat rearing. The project helped to create a sense of unity in the community and gained wider recognition for the Farmers Group, especially when one of its members won second place in a national competition (Youth Pioneer in Marine Area Award) (Indonesia Project 2.2).

- A “Mangroves are a Must!” campaign was launched by the Wildlife Clubs of Seychelles. Six mangrove teams were established to promote wetland conservation through partnerships and collective action by stakeholders in the target communities, with encouragement from government. Some of these communities have registered as associations and are now applying for their own funding support (Seychelles Project 4.2).

Working with people: changing mindsets

As many project implementers discovered, individuals seldom perceive their own activities as harmful to the environment. So it cannot be assumed that people automatically understand the relationship between their environment and their personal physical and economic well-being. Changing peoples’ attitude can be difficult and time-consuming, as it often requires persuading them to abandon or modify their traditional attitudes and practices, and even to learn and apply new skills (for example recycling and composting waste instead of discarding it in mangroves or on beaches).

- Human pressure on the Sundarbans mangroves is compounded by a widespread failure to understand that many local economic activities are harmful to the mangrove ecosystem (overfishing, for example). A review of previous community livelihood projects by the Forest Department showed that alternative livelihoods were still based on traditionally exploited

aquatic resources. New activities such as aquaculture or ornamental fish rearing could help to mitigate this problem, as could building trust between the community and the Forest Department (India Project 1.1).

- Traditional fishers in Maduganga estuary were trained to cultivate sea bass (*Lates calcarifer*) in cages to improve their income and reduce pressure on mangroves and the wild fish stock. To help themselves in this new venture, the fishers also had to acquire new knowledge and skills on related topics such as management, bookkeeping and marketing (Sri Lanka Project 5.22).

Working with people: effecting change

As noted above, change means changing attitudes and practices. The most effective way of doing this, as many projects illustrated, is to demonstrate tangible benefits from the changes proposed. Another effective strategy is to designate a “flagship” species which can provide a powerful focus for mobilizing public action on local environmental issues.

- A project to improve the health of the Angke Kapuk wetland near Jakarta included activities to sort and recycle waste by composting and making recycled paper products. Led by a women’s group, the project helped change people’s perception of waste, recognising it as an asset rather than something to be thrown into the river upstream of the wetland, as they were accustomed to doing (Indonesia Project 2.1).
- Mangrove-dependent villagers living near the Khlong Tha Rua Mangrove Forest Reserve in Phuket reported the return of otters as a sign of environmental recovery resulting from their efforts to rehabilitate and conserve the reserve’s mangroves. By identifying with the otter as a flagship

species, the community leaders advocated for additional conservation areas and for replicating of their approach by other communities, agencies and the private sector, including prawn farmers (Thailand Project 6.6).

Working with people: giving them space and real responsibility

Long-term sustainability can only be ensured if project participants are willing to step up and take responsibility. The first step in this process is to empower the target groups and allow them the space and freedom to operate. This gives people the opportunity and motivation to identify their own problems, formulate and apply their own solutions and, most importantly, to test their own innovations.

- ▶ Women from low-income families living near Puttalam lagoon were assisted to form two women's organizations, through which they were able to engage in business activities supported by a group revolving loan fund. They became empowered by being less economically dependent on their male family members, and also learned to solve other problems and conflicts without outside intervention (Sri Lanka Project 5.32).
- ▶ A Mangrove Rehabilitation Network in Ranong province planted the mangrove palm, *Nypa fruticans*, to provide raw materials for various marketable local products. Some villagers also found that *Nypa* palm could be used to control a climbing weed plant which can smother mangrove seedlings. Other local innovations included a floating raft used to exhibit youth conservation activities (Thailand Project 6.1).

Livelihood activities need to be linked to market chains

Several SGF projects provided important

lessons for similar projects seeking to promote alternative livelihood options. Firstly, the chances of success are greatly increased if the proposed activity is in line with local knowledge, skills and traditions. Secondly, however small an enterprise, it must be linked to a market chain to be commercially viable, even if this is simply the local wet market in the nearest town. Thirdly, local income-generating activities can often take advantage of wider social trends, for example growing consumer preference for natural or organically produced food and cosmetic products.

- ▶ Fishers in Bira Lantebung in South Sulawesi, who depend mainly on gathering crabs and other shellfish, were trained in mud crab farming using cage units developed and tested by the community as part of a project that also restored mangroves. A mud crab culture business was then developed as a livelihood opportunity, which introduced new practices while still carefully respecting the strong customs of this traditional community (Indonesia Project 2.4).
- ▶ The introduction of *Aloe vera* cultivation to fisher families at Puttalam lagoon was achieved quite easily. Yet, despite the wide range of products using *Aloe vera* in the medicinal, cosmetics, food and beverage industries, the producers had to be helped to establish market linkages, including a buy-back system (Sri Lanka Projects 5.30 and 5.31).

Knowledge-building and management support

Small grant projects can make valuable contributions to science

As demonstrated in several cases, the outputs of SGF projects can make valuable contributions to science and general knowledge. In some cases this was the main purpose of the project, particularly in India where several projects were designed to fill gaps in knowl-

edge about coastal resources management. In others, findings valuable to science were an unexpected benefit from projects with a more developmental objective.

- The mangroves in Gujarat were surveyed to assess their distribution and plant diversity. This resulted in the rediscovery of two mangrove species (*B. cylindrica* and *B. gymnorrhiza*) believed extinct in Gujarat, plus large populations of two other species (*Avicennia officinalis* and *Sonneratia apetala*) previously thought rare in the state (India Project 1.7).
- A project in the Maldives collected reference information on mangrove habitats throughout the country, the first time such an extensive study had been carried out. The information obtained was disseminated in various forms to the government, NGOs, UNDP and island communities, while several public meetings were convened to define policy directions in mangrove conservation and management (Maldives Project 3.5).

Project management requires understanding and perseverance

Taking time to understand local conditions and attitudes can be vital to project success, especially when dealing with traditional communities suspicious of external influences. Educating people requires much thought and perseverance, and educational materials must be carefully tailored to their intended audiences. Activities sensitive to climate or weather conditions, such as mangrove planting, horticulture and agriculture, must be timed carefully and risk factors (for example flooding) taken into account. Project managers should also be aware that local people may be unable to participate in activities during peak seasons for farming or fishing.

- Educational materials about Aldabra Atoll were developed for Seychellois children,

as well as a wider audience. Two books were designed to cater specifically for the learning needs of primary and secondary schoolchildren; a third book was prepared for adults, including tourists, and made available at the World Heritage Site Visitor Centre on Praslin. Despite employing professional educators in this work, delivery of these educational materials proved challenging and time-consuming (Seychelles Project 4.1).

- Environmental education programmes were provided to schoolchildren and community members living in the Maduganga estuary. It proved difficult to change the attitudes of community members, as they did not see their activities as detrimental to the health of the mangroves. But persistence by the NGO implementing the project finally resulted in the community agreeing to plant mangroves (Sri Lanka Project 5.26).
- Traditional, mainly Muslim fisher families in Krabi province took part in mangrove rehabilitation and conservation activities. However, the propagation of mangrove seedlings was affected by drought and water shortages, and rains and storms damaged the seedlings after they were planted out. Moreover, between December and February local people were too busy with their normal work to engage fully in project activities (Thailand Project 6.11).

Projects benefit from collaboration with local government agencies

Projects in all six countries reported the importance of engaging with local government. This “engagement” ranged from simply informing local authorities about project activities to setting up joint committees to facilitate multi-stakeholder involvement in local resource-use planning. The level of engagement depended on whether the aim was just to seek official endorsement of the

project, or actually to involve local authorities in project management. In many cases, the most desirable outcome was for the project to help build trust between local government agencies and the local communities (project beneficiaries). In some projects, creating solidarity among several participating communities helped attract greater government support.

- The project to improve the health and security of the Angke Kapuk wetland near Jakarta helped the community to engage and cooperate with key government figures in the regional authority for North Jakarta by creating a Joint Working Committee for waste management (Indonesia Project 2.1).
- Artisanal shark fishers in the Seychelles were helped to form an association, and also provided with equipment to enable them to record shark catch data. Over time, the project built trust with the shark fishers, making it possible to persuade them that their association would have a say in the government's national plan of action for the conservation and management of sharks (Seychelles Project 4.4).
- The project to revive local knowledge about mangrove-based foods in Phang Nga province used the issue of food security to promote mangrove conservation. This helped to mobilize government support, which included provision of a patrol boat for mangrove surveillance (Thailand Project 6.2).

Conclusions and lessons from project implementation

The SGF projects had a high rate of success in achieving their objectives and, in some cases, produced additional and unexpected results (specific outcomes from all the projects are listed in the profiles in part two of this synthesis). They also had a number of weaknesses, ranging from project design to implementation and reporting.

Below is a summary of the main strengths and weaknesses of the SGF projects, plus the factors that contributed to their success, positive impacts, and sustainability. The main conclusions and important lessons from project implementation relevant to future projects are also identified. Examples from each country are given where applicable.

Strengths of the SGF

The SGF offers a proven mechanism for engaging with local actors who are well-positioned to mobilize people around issues of local concern. Its main strength is that it puts money in the hands of local communities, often facilitated by an NGO or CBO.

SGF grants also bring with them a sense of official endorsement and credibility invaluable to projects seeking cooperation with local authorities, or co-funding from the private sector, or both. Involvement in an SGF project also gives local NGOs or CBOs leverage for securing funding from other sources to support post-MFF project activities.

Besides these overall strengths, Phase 1 of the SGF demonstrated that small grant projects can offer other, more specific, advantages or benefits:

- **Provide opportunities for experienced local implementers.** NGOs and CBOs have a long history of working with local communities, and their staff generally have a high level of knowledge and skills (this is especially true in Thailand). As a result, many of the projects appear to be well-positioned to continue operating in the longer term.
- **Contribute to wider national objectives.** In India Project 1.9, the Environmental Protection and Training Institute made a substantial contribution to national policy on coastal shelterbelts. Indonesia Project 2.1 produced data for a national inventory of flora and fauna, and Seychelles Project 4.4 enabled artisanal shark fishers to provide valuable data for a national action plan for the conservation and management of sharks.
- **Raise people's expectations for positive outcomes.** One strength of small grant projects, often overlooked, is how effectively they can raise expectations among poor or marginalized groups in society. Expectations, or beliefs about what is possible, are a key driver in changing attitudes and practices. Project 5.14 in Sri Lanka, for example, hoped to enhance the income of the 25 paddy farmers clearing cattails from a village drainage canal. Also, wherever project reports mentioned "building trust", one can also read "building expectations". As the coordinator of Thailand Project 6.1 reported, "The project changed people's attitudes and outlook, encouraging them to be more open and listen more closely to communal concerns". Lastly, any project which sets out to "raise awareness" is indirectly addressing people's expectations.
- **Encourage local innovation.** One path to success which should not be overlooked is creating opportunities for people to innovate for themselves. This was most apparent in some of the projects in Thailand, where, for example, villagers planted *Nypa* palm to control weed growth in a *Pandanus* nursery (Project 6.10) and constructed artificial reefs using degradable materials (Project 6.15).

Weaknesses of the SGF

Although the SGF demonstrated a number of admirable strengths, several limitations emerged that should be considered when planning future projects. The following limitations were common to projects in all six countries.

- ▶ **Understanding of actions to achieve project goals.** Many projects conducted “awareness-raising” programmes or campaigns. The Maldives projects in particular put a heavy emphasis on raising awareness, yet project implementers seem to have been unclear about what exactly “awareness” is, or what raising awareness means. Although it is a worthwhile objective to produce awareness-raising materials, such materials are not an end in themselves. The impact of leaflets, billboards and radio spots can be increased greatly if they are part of an intentional communications effort linked to longer-term goals.
- ▶ **Understanding of cross-cutting themes.** Besides the 15 thematic POWs, MFF introduced gender equality and effective communications as two cross-cutting themes important to all projects, and climate change as a third theme relevant to many projects. Although most project teams had some prior knowledge of these topics, it became clear during implementation that MFF should: a) invest more in formal training to ensure that the concepts involved are understood properly; and b) teach project implementers to use tools appropriate for management decision support and monitoring in relation to these themes. This conclusion is supported by the following specific observations:
 - ▶ Overall, project performance in gender equality issues was inadequate.
 - ▶ Across all six countries, projects seemed to have only a limited understanding of the role of coastal ecosystems (such as mangroves) in climate change adaptation or mitigation. The only project to take explicit action on the impacts of climate change was in Khlong Prasong (Thailand Project 6.11), where participants used concrete pipes to control beach erosion.
 - ▶ Many SGF projects did not address their communication needs adequately, or failed to realize the full potential for conveying their results to a wider audience. Some notable successes in communicating project results to the national policy level were achieved, however, for example on the status of mangroves and coastal shelterbelts in India (Project 1.9). The item below on reporting and documentation gives further insight into why many projects failed to achieve effective communication.
- ▶ **Reporting and documentation.** This seems to have been an area of some difficulty. Project reports were noted sometimes to lack basic information, for example on contact details of local project managers, names and affiliations of important project stakeholders, and so on. Quantification was also sometimes absent where it should have been present, especially in the section on target beneficiaries (for example, number of people in a target community, number of

When reporting on gender aspects, many project managers who mentioned women and women's groups tended to do so in the form of generalities or stereotypes; for example, highlighting the role of women as weavers or keepers of culinary knowledge.

households earning an income from fishing, and so on). It must be acknowledged, however, that English often was not the first language of project coordinators, so they may have had difficulty coping with MFF's reporting requirements. This is another area of capacity building where technical backstopping and training could make an important contribution to improving project communication.

► **Opportunities for communication between projects.** Many of the local implementers demonstrated strong capacity for facilitating participation by a wide cross section of stakeholders. But what appeared to be lacking was a similar spirit of participation among projects within a country and between countries. Naturally, local managers focus primarily on their project's immediate objectives. Yet communicating with each other about project results and common issues could yield synergies and help identify concepts for future projects. Thus, MFF should invest in mechanisms that will promote information sharing among projects and countries, beginning with those that will help SGF project managers to share and exchange information more effectively, such as social media and web tools for information exchange.

► **Use of existing knowledge.** Although local innovation should be encouraged when needed, it is unnecessary to support activities that reinvent the wheel. Project managers could have taken more advantage of the considerable knowledge that exists in the literature on good practices, such as for mangrove seedling production and replanting. Thailand and other countries, for example, have mangrove field stations with a great deal of documented knowledge available on what makes a successful mangrove nurs-

ery. Likewise, there is a substantial literature on poultry farming and aquaculture, and the roles these technologies can play in alleviating poverty.

► **Private sector involvement.** With a few important exceptions (India Project 1.8, Seychelles Project 4.6), limited private sector involvement was noted across all countries. Where the private sector was present, it was often seen as an adversary, reflecting in part the culture of distrust of the private sector among NGOs and CBOs. Future SGF projects should look at building bridges through alliances with companies operating serious Corporate Social Responsibility (CSR) programmes.

Ensuring success and sustainability

The countries covered by this synthesis differ widely in terms of their geophysical, socioeconomic, cultural and political characteristics. Nevertheless it is possible to discern a number of underlying elements common to the success of many projects in all six countries, which resulted in positive impacts and indicate good prospects for sustainability. The following attributes featured consistently in many of the small grant projects.

► **Choosing local partners with experience and expertise.** A key underlying factor in the overall success of the projects was the knowledge, skill and commitment of the local implementing partners. Those who had been operating for a number of years were more likely to have the skills and dedication required to mobilize the community and other stakeholders in support of the project objectives. The Ban Don Bay Conservation Network in Surat Thani province, for example, was formed in the early 1980s (Thailand Project 6.13), and a number of

other grantees in Thailand were organizations formed to take action in the immediate post-tsunami recovery period.

► **Partnering with local institutions.**

Linking the project to existing institutions helped to mobilize local capacity and support, including endorsement and active involvement by local government authorities. In Thailand, for example, the Mangrove Resources Development Stations under the Department of Marine and Coastal Resources (DMCR) were cited in several project reports as important sources of financial and technical support. In most countries, and especially the Seychelles, enlisting the cooperation of local schools and engaging youth was an important factor contributing to project success, and one which also increased the likelihood of sustainable results. In Indonesia, there was a notable example of project engagement with *Pesantren* (Islamic boarding schools) and religious leaders as a key factor of success. Their involvement mobilized the community to a degree that would have been difficult to achieve otherwise.

► **Harnessing the knowledge and capacity to mobilize people.**

One underlying factor in project success was the knowledge and capacity of local implementers to mobilize the target communities and other important stakeholders, including local government officials. Above all, nearly all project implementers were aware, or soon discovered, that involving people in communities and instilling a sense of ownership is perhaps the key factor in achieving a project's objectives. Most projects found

approaches or methods to create this all-important ownership. One highly effective technique was to demonstrate tangible benefits to people. This helped persuade them that the innovations proposed were both practical and directly beneficial, making them more willing to participate.

► **Ensuring community involvement; providing a clear project vision.**

Ensuring community involvement, having a clear project vision, having the ability to enthuse and motivate stakeholders by demonstrating success relevant to their professional interests, and addressing both personal and communal economic concerns, were all underlying factors in project success. The projects in Sri Lanka did particularly well in initiating small but sustainable livelihoods projects using simple technologies and participatory approaches which stimulated people's interest and awareness.

► **Providing open access to information.**

Access to information is essential to empower informed decision making. To achieve this, projects should make information materials open access (i.e. freely available to copy for non-commercial purposes) and disseminate them widely to interested parties. Project managers reported that information materials were frequently used by groups such as school environmental clubs, environmental NGOs and youth groups during their various events. If made freely available, environmental messages in the form of songs, videos, radio spots and other media products will continue to reach audiences for a long time to come.

General conclusions and recommendations

- ▶ **Overall achievements.** Collectively, the MFF SGF projects made substantial contributions to rehabilitating, conserving and managing local ecosystems; to building the capacity of both local NGOs and community organizations; and to strengthening the livelihood options of people in traditional coastal communities. Although the number of people involved in some projects was quite small, the total number of beneficiaries in all six countries is impressive, especially as not all projects systematically quantified their outputs.
- ▶ **Thematic areas targeted.** Reviewing the accomplishments of the first phase of the SGF, it is clear that all 79 projects contributed strongly to the MFF POWs they targeted. Five of the 15 POWs were strongly supported by projects in all six countries. In descending order of importance, these are: Promoting civil society engagement (POW 6); Supporting environmentally sustainable livelihoods (POW 8); Designing sound coastal rehabilitation (POW 2); Improving knowledge for management (POW 1); and Improving community resilience (POW 9). In summary, the SGF projects have contributed most to facilitating enhanced and informed governance by coastal decision-makers, and they have also improved community well-being and coastal ecosystem health.
- ▶ **Return on investment.** A high return from quite modest financial investments was a key achievement of the SGF, which provided a maximum grant of US\$25,000 per project (many grants were much less). By carefully selecting projects with potential for growth, SGF grants served as seed money. Moreover, the grants placed funds directly in the hands of local organizations, mainly NGOs and CBOs, thereby giving them a sense of official recognition and credibility, as well as the financial resources to make direct investments on behalf of the local communities they represent.
- ▶ **Endorsement and recognition.** SGF funding also brought a sense of endorsement that raised a project's status and made further development and subsequent applications for funding more likely to succeed. External recognition, in the form of awards or participation in national events, was another powerful motivator that raised the profile of projects. This helped to build confidence and promote wider interest in projects, leading to better dissemination of results. Project planners should look for ways to link project activities with external rewards or other similar incentives. Similarly, formally registering local associations or groups is recommended as a way of improving people's capacity to act together and thereby promoting long-term sustainability of results.
- ▶ **Project ownership.** Creating a sense of ownership among the intended beneficiaries is perhaps the central factor in achieving a project's objectives. The most effective way to promote community involvement and ownership is to demonstrate tangible benefits, so people can see that the project innovations are both practical and valuable; these attributes will in turn encourage participation.
- ▶ **Changing behaviour.** People seldom see their activities as harmful to the environment, so it cannot be assumed that they understand the relationship between their environment and their well-being. Changing peoples' attitudes can be difficult and time-consuming, as they often have to be persuaded to abandon or modify traditional practices, or learn and apply new skills. The most effective way to change mindsets and practices is to

demonstrate tangible benefits from the proposed changes.

is an important part of planning for sustainable outcomes.

- ▶ **Culture and education.** Fundamental to achieving ownership and changing behaviour is developing a good understanding of the target community and how best to impart new knowledge. Taking time to understand local conditions and attitudes is vital to project success, especially when dealing with traditional communities that may be suspicious of external interference. Educating people requires much thought and perseverance, and educational materials must be tailored to their intended audiences. Involving local religious leaders or school teachers can be an effective way of imparting learning to communities.
- ▶ **Enhancing livelihoods.** When introducing alternative livelihoods, the chances of success will be much higher if the proposed activity is in line with local knowledge, skills and traditions. Beneficiaries also need appropriate business skills such as bookkeeping and marketing. Production must be linked to a market chain to ensure that activities are commercially viable for the producers. Consideration of wider social and market trends may also be helpful, for example growing consumer preference for more naturally produced products.
- ▶ **Ensuring sustainability.** Long-term sustainability can only be ensured if project participants are willing to step up and take responsibility. The first step in this process is to empower target groups and allow them the space and freedom to operate. This gives people the opportunity and motivation to identify their own problems, formulate and apply their own solutions and, most importantly, test their own innovations. Engaging young people
- ▶ **Communicating effectively.** The SGF projects achieved impressive results in communication, generating wide coverage in the media (print, radio, television and online). They also developed a large range of promotional materials, including DVDs, t-shirts, pamphlets, posters and wall calendars, as well as training manuals and other educational materials. However, insufficient consideration was given to understanding the profile and information needs of the target audiences for these products. It is especially important to provide information in a relevant form. To improve project communications further, MFF should prepare a communications toolkit advising on best practice and techniques to generate media and public attention, thereby helping to extend the reach and impact of project activities.
- ▶ **Project backstopping.** Carefully targeted backstopping, linked to capacity building, could significantly improve the performance of future SGF projects, particularly in management-related areas such as reporting. MFF should give further consideration to the types and levels of backstopping that would most benefit local project managers and other stakeholders. This recommendation applies particularly to the MFF cross-cutting themes of gender equality, climate change and effective communication, which were often poorly understood by project managers.
- ▶ **Sharing information.** It is clear that project managers can learn a great deal from one another if effective information-sharing mechanisms are in place. Besides exchange visits where practical,

MFF should consider using online and social media tools to facilitate information sharing and exchange between projects.

- **Building confidence.** Confidence is a key element in achieving project success. Project managers and partners are generally sensitive to this intangible quality, and often very good at building confidence among their target beneficiaries, which in turn helps to empower them. MFF should consider ways to record or even measure gains in confidence as part of its monitoring, learning and evaluation system.

- **Engaging the private sector.** Although a small number of projects reached out to the private sector, the huge potential for corporate involvement in the SGF went largely untapped. High-profile activities such as mangrove rehabilitation would seem to offer particularly attractive opportunities for investment by businesses through their CSR budgets. MFF should look carefully at ways of increasing private sector involvement in future projects, including promoting some of the successes from the SGF projects in Phase 1 to potential private sector partners.

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Part 2

Achievements of the Small Grants Facility Projects by Country

SGF project achievements

The SGF projects in India generated a wealth of information on the status of mangroves and coral reefs, and on current practices for mangrove rehabilitation. They also provided examples of ways to involve local communities and the private sector in managing coastal resources. There was a strong focus on information for management (POW 1), with several projects contributing substantially to the flow of information from the field to local and national authorities. The project on coral reefs, for example, organized a national conference and published 28 peer-reviewed papers on the status, threats and recommended conservation measures for India's coral reefs (Project 1.5).

Other projects produced maps and survey data on biophysical and social factors affecting mangroves and the people who depend on the services provided by mangrove ecosystems. For example, one project produced a comprehensive status report on the distribution of India's coastal forest shelterbelts (Project 1.9). The mapping and survey results from this project have been put in the public domain, and are – and will continue to be – used by decision makers in coastal management and rehabilitation planning. Similar use is being made of data from a floristic survey of the mangroves in Gujarat (Project 1.7).

An assessment of mangrove rehabilitation projects and community empowerment (Project 1.3) may have significant implications for guiding other similar projects, especially in achieving continuity through an integrated approach (such as co-management schemes between the state Forest Departments and local communities). A related project that assessed alternative eco-friendly livelihoods in the Sundarbans mangrove forest has resulted in a pledge by the West Bengal Forest Department to maintain and periodically update the database on sustainable livelihoods (Project 1.1).

Aquaculture initiatives, in the form of an integrated mangrove fishery farming system in Tamil Nadu (Project 1.4) and eco-friendly freshwater prawn culture in the Sundarbans (Project 1.2), are commendable in that they offer an income to local communities and business-minded entrepreneurs, and this helps to ensure sustainability. Local business people and aquaculture farmers are pursuing plans to replicate the integrated fishery farming model, and the owners of the pond used to develop the model have pledged to support long-term monitoring of water conditions.

It is also commendable that India's SGF projects adopted various sustainability measures. These included building capacity at various levels in both agencies and communities; institutionalizing adaptation measures; and integrating environmental awareness activities into local school activities.

Conclusions

MFF in India has focused in particular on improving the scientific knowledge base for integrated coastal management, and on managing coastal and marine biodiversity. Thus, most SGF projects in India were concerned with research into ways to nurture sustainable coastal management or, as in the case of the shelterbelt mapping study and the floristic survey projects, sought to add to existing scientific knowledge with a view to optimizing future coastal rehabilitation programmes.

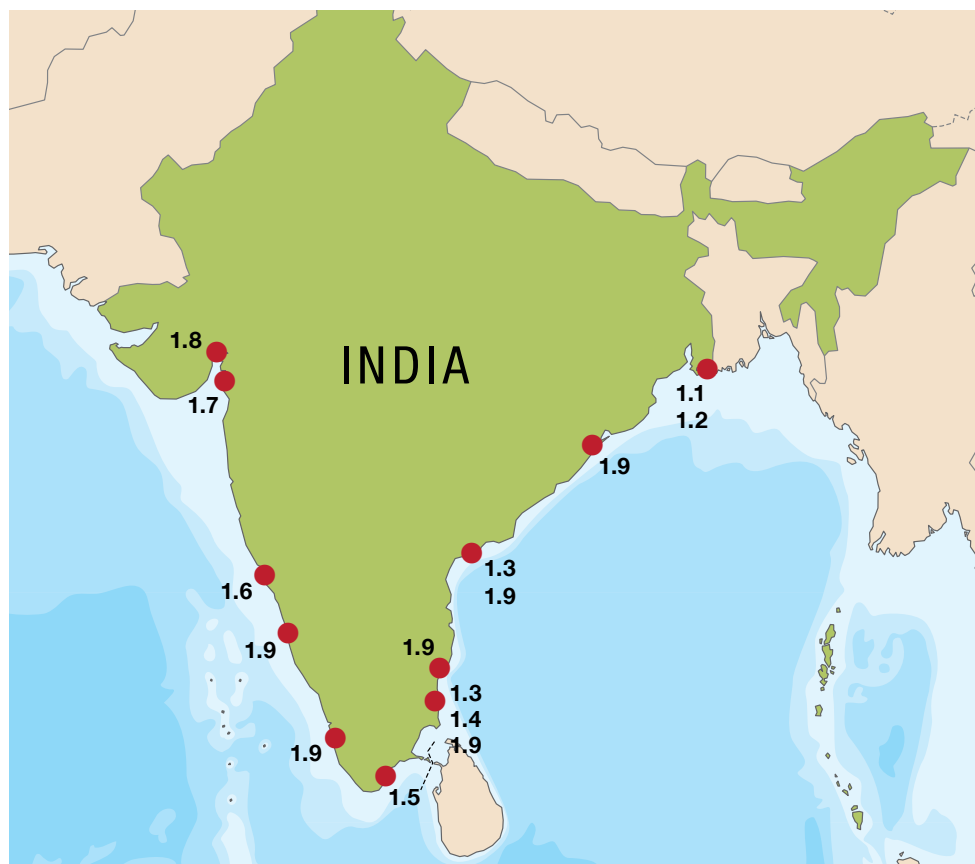
National symposia supported by MFF have greatly contributed to increasing knowledge on both mangrove and coral ecosystems. Information sharing with civil society is also helping to raise awareness of India's valuable coastal resources.

In most cases the principal project beneficiaries were local communities, many of whom depend almost entirely on healthy coastal ecosystems for their livelihoods and

survival. Projects also targeted stakeholders such as NGOs and government departments involved in coastal environmental management and decision making.

SGF INDIA PROJECTS

- 1.1** A critical evaluation of the impacts of alternative livelihood programmes to reduce dependence on the Sundarbans mangroves
- 1.2** Sustainable freshwater aquaculture in the mangrove-dominated Indian Sundarbans
- 1.3** Mangrove restoration: participatory assessment of current practices
- 1.4** Sustainable coastal livelihoods through Integrated Mangrove Fishery Farming Systems (IMFFS)
- 1.5** Coral reefs of India – status, threats and conservation measures
- 1.6** Demarcating safe zones for harvesting edible bivalves in mangroves along the Goa Coast by determining trace metal levels
- 1.7** Floristic diversity and natural recruitment of mangrove species in selected mangrove habitats of South Gujarat
- 1.8** Conserving and regenerating mangroves at Mithapur
- 1.9** Status of shelterbelts along India's southern coast



General location of SGF Phase 1 projects in India

1.1 A critical evaluation of the impacts of alternative livelihood programmes to reduce dependence on the Sundarbans mangroves



Honey collectors in the Sundarbans, West Bengal, India © Pradeep Vyas



LOCATION

Sundarbans, West Bengal, India

PRIORITY POWS

Knowledge for Management
Monitoring, Learning and Evaluation
Coastal Governance

DURATION

7 December 2008 to 31 August 2009,
extended to 31 January 2010

MFF GRANT AMOUNT

US\$10,000

Objectives

The Sundarbans SGF project set out to evaluate the impacts of livelihoods interventions aimed at reducing local dependence on forests. It looked at eco-development activities, infrastructure and agricultural development, afforestation, soil conservation, protection of embankments and mangrove planting. The project also sought to evaluate and rate confidence-building activities in community development projects, and to evaluate different alternative and sustainable development initiatives.

Background

The Sundarbans is one of the largest mangrove ecosystems in the world, covering an area of 9,400 km². Its 4.2 million inhabitants are unevenly distributed with a high population density of 800 people/km², generating considerable anthropogenic pressure on the ecosystem. The West Bengal Forest Department launched this project to review past livelihood interventions and recommend priority areas for funding to develop alternative, eco-friendly livelihoods that will balance biodiversity conservation with human devel-

opment. The methods used included questionnaire surveys, focus group discussions, physical verification of assets and the analysis of secondary data from Gram Panchayats (local village councils) on infrastructure and facilities in the targeted villages.

Target beneficiaries

Joint Forest Management (JFM) members, Forest Protection Committees (FPCs) and Eco-Development Committees (EDCs). These organizations all include women as members.

Outputs

- A comprehensive analysis of past activities and programmes undertaken by the West Bengal Forest Department in 50 village JFM Committees and their effectiveness under the Alternative Livelihoods Programme.
- Recommendations for improving the relationship between the Forest Department and local people – a relationship that is critical for long-term conservation of the Sundarbans ecosystem.
- Recommendations for successful alternative livelihood interventions that will be needed to address conservation and livelihoods needs in the long run.
- An evaluation of past and present livelihoods projects to address the increasingly important issue of climate change adaptation.

Accomplishments and challenges

A detailed report on biodiversity-dependent local livelihoods has been submitted to the Forest Department, including baseline data and trends in fishing (legal and illegal), wood gathering and honey collection over the past three decades. The project found that infra-

structure development (wells, jetties, solar lighting and so on) has had a positive impact on the alternative livelihoods promoted in the region, so it should be a key element in any future discussion on alternative livelihoods. The project also highlighted the need to develop disaster risk reduction strategies for biodiversity-dependent villages.

The Forest Department has agreed to maintain and update the information database, ensuring sustainability of project outputs. The success of confidence-building measures between the Forest Department and local communities has lessened human-wildlife conflict. Local people now report straying wild animals and trust the Forest Department to take appropriate action.

Challenges

Cyclone Aila struck West Bengal in 2009, causing delays in project implementation. In some cases it also affected the questionnaire surveys, as answers tended to be “Alia-biased” and unrepresentative of “normal” conditions. Framing survey questions proved challenging as each stakeholder group had many sub-groups (for example “fishers” include marine fishers, freshwater fishers, crab collectors and so on), each usually with different competing needs and interests. In

view of the dynamic nature of the ecosystem, climate change and human societies, it was recommended that all future alternative livelihoods projects should be limited to three years to be meaningful.

Lessons learned

Some local people do not see their activities as harmful to the Sundarbans ecosystem, an attitude that paves the way for rampant illegal activity such as overfishing. Changing such attitudes is difficult and time-consuming. Aquaculture may help to mitigate the problem to some extent, but beekeeping is unpopular because of its cost and labour requirements. Ecotourism has strong potential, but the mechanism for sharing money earned from tourism by EDCs is currently inequitable and needs to be revised. Alternative livelihood options based on aquatic resources, such as ornamental fisheries, crab fattening and oyster culture, are more in line with local traditions, preferences and skills. The project made a strong case for linking infrastructure development with alternative livelihood schemes to ensure their success.

Partners and their contribution

WWF Bengal conducted the village surveys under the project.

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1.2 Sustainable freshwater aquaculture in the mangrove-dominated Indian Sundarbans



Collecting *Porteresia*, West Bengal, India © University of Calcutta

growth of prawns. The key elements of this project included developing an alternative feed from salt marsh grass (*Porteresia coarctata*) to make scampi culture more sustainable and environmentally friendly, and raising awareness among farmers of the importance of maintaining water quality.

Target beneficiaries

Local freshwater aquaculture farmers of the Indian Sundarbans.

Outputs

- ▶ Water quality was tested in experimental scampi ponds using floral feed and the results compared with those from control ponds using commercial meat-based feed.
- ▶ Locally appropriate feed-preparation technology was developed using locally sourced marsh grass pulp as the main feed ingredient.
- ▶ The impact of formulated feed on prawn biomass, survival rate, condition index (length and weight) and feed conversion ratio was investigated.
- ▶ The relationship between protein-rich feed and protein levels in prawn tissue was tested through regular monitoring.



LOCATION

Sundarbans, West Bengal, India

PRIORITY POWS

Knowledge for Management
Strategies for Management
Coastal Governance

DURATION

2 December 2009 to 1 January 2011

MFF GRANT AMOUNT

US\$12,000

Objectives

This project examined the protein content of salt marsh grass with a view to developing an eco-friendly, nutritious feed for freshwater prawns. It adapted feed preparation technology to local conditions by using locally sourced floral pulp as the main feed ingredient, and assessed the impact of this floral feed on prawn biomass, survival rate, condition index and feed conversion ratio. The goal of the project was to determine whether floral feed can offer better aquaculture nutrition and cleaner, more eco-friendly prawn farming than commercially available feed.

Background

Aquaculture farmers in the Indian Sundarbans are increasingly using organic fertilizer and feeds for freshwater culture of scampi (*Macrobrachium rosenbergii*), a species of prawn that commands high export prices. In recent times, interest has grown in the nutritional quality of coastal flora as an alternative to the trash fish and mollusc flesh used in commercially available feeds, which degrade water quality, reducing the survival and

Accomplishments and challenges

The project successfully used science to enhance traditional aquaculture practices. By demonstrating improved productivity and pond health from using the new floral feed, the project won support from local prawn farmers. At the same time, the new feed enhanced water quality, which will in turn protect the existing mangrove habitat and help stabilize mudflats. Prawns reared on floral feed also exhibited greater weights and

redder colouring (both attributes with high consumer appeal), and grew more quickly than prawns in control ponds.

Demonstrating the increased effectiveness of locally sourced floral feed has motivated aquaculture farmers in the area to adopt the practice on a larger scale. The survival rate of floral-fed prawns is 76%, compared with 70% for prawns fed on commercial meat-based feed. The project also found that using floral feed produces less waste and so helps to improve water quality. The project had the dual benefit of developing an eco-friendly prawn culture practice and creating an alternative livelihood for women through feed preparation and establishment of a nursery of *P. coarctata* grass to provide raw material. The government of West Bengal has agreed to train local communities in feed production, thus guaranteeing project sustainability.

Challenges

The challenge for this initiative lies in marketing the floral feed product to encourage its

uptake by aquaculture farmers regionally and nationally, and to ensure it can compete successfully with commercial feeds.

Contributions to cross-cutting themes

Communications and gender equality

A guide (in Bengali) was developed to create awareness among local communities of scampi and the benefits of rearing them on floral feed. The project provided an alternative livelihood for women in the form of preparing feed and developing a *P. coarctata* nursery to provide raw feed material.

Lessons learned

Thanks to intensive participatory testing with local communities and other stakeholders, this small-scale aquaculture initiative was readily adopted and has strong prospects for alleviating poverty, being environmentally sustainable and locally appropriate. Full ownership and participation by beneficiaries and land owners are vital if such scientific exercises are to be sustainable.

“Commercial feed contains trash fish and shrimp dust as a source of protein. The residual commercial feed degrades water quality by increasing the organic carbon, nutrient load, biochemical and chemical oxygen demand, and total coliform bacteria.”

— DR ABHIJIT MITRA
PROJECT LEADER

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1.3 Mangrove restoration: participatory assessment of current practices



Assessing mangroves, Tamil Nadu, India © MSSRF

sedimentation processes. The importance of hydrological regimes is now understood but weaknesses still remain. For example, 90% of the mangroves currently being planted are *Avicennia marina*, neglecting other species in need of regeneration (although in many highly saline areas only the salt-tolerant *A. marina* can be planted). Second, inadequate attention is given to community livelihood issues. Third, village planning institutions lack the technical, social and economic capacity to sustain mangrove restoration efforts. This project addressed these issues in the states of Tamil Nadu and Andhra Pradesh.

Target beneficiaries

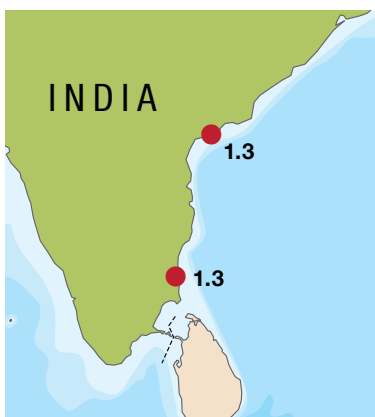
Local communities and Joint Mangrove Management (JMM) stakeholders.

Outputs

- Identification of the strengths and weaknesses of current techniques in mangrove restoration by stakeholders (communities), and identification of opportunities to improve those techniques.
- Identification of the strengths and weaknesses of the participatory process followed by JMM and village institutions.
- Identification of gaps and remedial measures in the roles and responsibilities of different stakeholders, particularly primary stakeholders such as local communities and the state Forest Department (FD).
- Identification of opportunities to enhance income from mangrove planting and restoration, and to reduce poverty amongst mangrove-dependent communities.

Accomplishments and challenges

Stakeholders have indicated that mangrove cover has increased considerably, and that dependence on mangroves for firewood



LOCATION

Tamil Nadu and Andhra Pradesh, India

PRIORITY POWS

Knowledge for Management
Strategies for Management
Monitoring, Learning and Evaluation

DURATION

19 February 2010 to 1 February 2011,
extended to 30 May 2011

MFF GRANT AMOUNT

US\$17,400

Objectives

The project's objectives were to assess current techniques for restoring degraded mangroves and for pioneer planting in new areas, as well as the social and economic benefits and constraints of these activities. The project also looked at current institutional mechanisms at the grassroots level and their roles in mangrove restoration and protection. It identified livelihood enhancement and diversification opportunities which can be integrated into restoration programmes, and developed strategies to overcome the technical, social, institutional and policy constraints to planting.

Background

The importance of mangroves was recognized by wetlands managers in India in the early 1980s, leading to a complete turnaround in forest policy from intensive exploitation to full protection. During the early 1990s, management focused on restoration, principally by replanting. The results were generally poor as attention focused on the forest component, neglecting other important aspects such as hydrology and

has decreased. However, a weakening of FD involvement with community stakeholders may reduce planting success in future initiatives.

Village Forest Councils (VFCs) need to be strengthened and all stakeholder roles clearly defined. Monitoring and evaluation of the FD officials involved in VFCs should be instituted to gain community trust. Welfare schemes in coastal areas need to be integrated with management of mangroves, since these provides the core livelihood security for communities in the region. All-concrete houses should be provided to residents, and policies adopted to promote the supply of gas to mangrove-dependent households.

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Lessons learned

Participatory analysis of community perceptions of mangrove management practices is essential to understanding the associations between these practices and communities. It is also necessary to refining future strategies and policies on mangrove restoration and joint management. In most cases, communities have not taken ownership of their mangroves because JMM is perceived locally as an FD project, not a continuous process involving communities. Wherever a strong partnership links communities, the FD and NGOs, the results in terms of both increases in mangrove cover and community empowerment are better and more sustainable.

1.4 Sustainable coastal livelihoods through Integrated Mangrove Fishery Farming Systems (IMFFS)



Sea bass harvested from IMFFS farm, Tamil Nadu, India © MSSRF

response designed an integrated mangrove fishery farming system to support the development and demonstration of aquaculture systems in community mangroves that integrate livelihood security with ecological security.

Target beneficiaries

Prawn farmers (land owners) and local communities.

Outputs

- ▶ Two different models of IMFFS were developed and demonstrated in abandoned prawn farms.
- ▶ Ninety-four women, men and youth from coastal communities, as well as 21 managerial field staff from state and central government agencies, took part in orientation and exposure visits to IMFFS sites and learned about the IMFFS protocol.
- ▶ Commercially important fish such as sea bass and mullet were successfully grown and harvested in the integrated mangrove farms.
- ▶ Preparation has begun of manuals in local languages describing methods for replicating IMFFS.



LOCATION

Tamil Nadu, India

PRIORITY POWS

Strategies for Management
Civil Society Engagement
Community Resilience

DURATION

6 January to 31 October 2009,
extended to 31 December 2009

MFF GRANT AMOUNT

US\$21,000

Objectives

This project sought to create awareness among local communities and other stakeholders of the need for alternative or additional income-generating activities based on natural resources, and to demonstrate a brackish water and mangrove-based farming system for wider replication. Also a priority was enhancing the capacity of women, local NGOs and government agencies for developing integrated mangrove fisheries.

Background

Chemically intensive, environmentally damaging coastal prawn farming was popular in India during the early 1990s. However, monocultures, disease, poor seed quality, excessive use of artificial feed, poor environmental management, increased input costs and decreased market returns contributed to a wide-scale collapse of aquaculture production. Consequently large areas of coastal land, too saline to be returned to their original agricultural use, were abandoned and local farmers and land owners left destitute. The project recognized the pressing need to return these lands to productivity, and in

Accomplishments and challenges

The IMFFS farms work on the principles of ecological and environmental sustainability. They are fed by tidal water, making pumps unnecessary. Tidal flows also bring in natural feeds and new fish and prawn seed, and flush away wastes.

Both IMFFS models had a very high mangrove survival rate (92%). Also encouraging were survival rates for introduced tiger prawn seed and mullet and sea bass fingerlings (60%). In all, 94 community members (including 36 women), and 21 state and central gov-

ernment staff, developed their capacity for IMFFS through workshops and exposure visits. The project successfully overturned the negative local perception of aquaculture caused by the industry's collapse in the 1990s. The Aquaculture Authority of India is exploring the possibility of eco-labelling IMFFS products.

Challenges

One issue faced by the project was the need to document fully the economic returns from IMFFS to support replication and scaling-up.

The impacts of climate change on the coast are a growing challenge. It is hoped that the mangroves will help protect the IMFFS ponds from extreme weather events.

Contributions to cross-cutting themes

Communications

The project produced a training manual on IMFFS methods for communities interested in replicating the field models.

Gender equality

Alternative livelihoods for women were created through the provision and operation of air-conditioned market stalls (to extend the shelf life of fish and other marine products), and the production of organic fertilizer using waste and dead fish from the IMFFS ponds. Thirty-six women attended workshops on project procedures and products, and joined site visits. If the IMFFS methods are adopted by local communities, both men and women

will benefit from the new livelihood opportunities they offer.

Climate change

The predicted increase in terrestrial salinity from rising sea levels will lead to changes in land use. IMFFS will help compensate for any agricultural land lost in this process, thus enhancing the capacity of coastal communities to adapt to climate change.

Lessons learned

Project designs have to be adaptable. In the case of IMFFS, project partners did not anticipate that training facilities and manuals would be needed to satisfy the high level of popular interest.

It is important to consider the future impacts of project activities. Although IMFFS relies on natural tide-borne feed, making artificial feed unnecessary and so contributing to water clarity, growing mangrove plantations can eventually degrade water quality by causing dead plant matter to accumulate in the ponds. Long-term monitoring is needed to understand the scale of this threat. In this respect, it is encouraging to note that both the M.S. Swaminathan Research Foundation and the land owner (SSS Marine Farms) continue to develop IMFFS with other funding and are addressing these monitoring needs.

Partners and their contribution

M.S. Swaminathan Research Foundation (long-term monitoring); SSS Marine Farms (provided land *gratis*).



IMFFS prototype (model 1), Tamil Nadu, India © MSSRF

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1.5 Coral reefs of India – status, threats and conservation measures



Release of SDMRI publication, Tamil Nadu, India © SDMRI

and attended by government officials, natural resource managers, scientists and research students from India's four major reef areas (the Gulf of Mannar, Gulf of Kachchh, Lakshadweep, and the Andaman and Nicobar Islands).

Twenty-eight papers were presented and reviewed at the conference, dealing with issues such as coral diseases, the impacts of climate change on coastal ecosystems, threats to corals, and the impact on corals of invasive alien seaweed species. All except two of these were afterwards compiled and published in the book *Coral Reefs of India – Status, Threats and Conservation Measures*.

Target beneficiaries

National and international stakeholders with an interest in the conservation and management of coral reefs.

Outputs

- Over 50 stakeholders attended the conference.
- Twenty-eight research papers were presented and peer reviewed.
- Twenty-six of the papers were published in the book *Coral Reefs of India – Current Status, Threats and Conservation Measures* (edited by J. R. Bhatt, J. K. Patterson Edward and B. P. Nilaratna) in collaboration with MoEF, SDMRI and MFF.
- The book was published on the Internet and is being distributed to marine research stations and relevant government bodies.

Accomplishments and challenges

The shared interests of the participating group aided communication, helping members to identify the gaps between research and practice, and to make recommendations



LOCATION

Tuticorin, Tamil Nadu, India

PRIORITY POWS

Knowledge for Management
Coastal Governance
Marine Protected Areas

DURATION

29 October to 31 December 2008

MFF GRANT AMOUNT

US\$11,000

Objectives

This project organized a conference bringing together researchers, managers, policy makers and forest officials directly or indirectly involved in coral conservation in India to discuss and present their experiences and findings. It aimed to produce a book based on the conference papers and other information that would serve as the primary reference for developing action plans to conserve the coral reefs of India.

Background

Coral ecosystems in India, as elsewhere, face a number of worsening anthropogenic threats, including bleaching, destructive fishing practices, pollution and climate change. In response to this situation, and to commemorate the International Year of the Reef 2008, MFF India convened a conference bringing together key stakeholders in coral conservation to present research papers, participate in discussions, and share lessons and experiences. This event was organized by the Suganthi Devadason Marine Research Institute (SDMRI) under the auspices of the Ministry of Environment and Forests (MoEF),

on putting research at the centre of policy decisions on coastal conservation. Community participation in reef conservation was also emphasized as a priority.

The discussions and exchange of ideas at the conference were lively and thought-provoking, the number of participants was encouraging, and the event was well-organised and yielded tangible results in the form of scientific papers and a book that will serve as an important reference for coral conservation in India.

Contributions to cross-cutting themes

Communications and climate change

The project produced research papers and a book on conserving India's corals. Climate

change was a major talking point at the conference, with participants sharing their opinions, experiences and recommendations on its impacts and response measures.

Lessons learned

Conference participants agreed that the participation of local people in coral reef stewardship and conservation should be promoted nationally on a much wider scale. Lastly the impact of the trade in coral was not adequately addressed by the conference and should be emphasized in future gatherings.



Lighting of Kuthuvizhakku by Dr B. P. Nilaratna, Joint Secretary, MoEF, India © SDMRI

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1.6 Demarcating safe zones for harvesting edible bivalves in mangroves along the Goa Coast by determining trace metal levels



Locals collecting *Paphia malabarica*, Goa, India © NIO

by pollution from a flourishing mining sector which is helping to drive the state's economic growth. Mining is supported and encouraged by the region's many navigable rivers, which facilitate the transport of manganese and iron ores. A resulting problem, however, is heavy metal seepage into the waterways, exacerbated by the discharge of urban waste and wastewater from Goa.

In view of the importance of bivalves to the people of Goa and its surrounds, this project was launched to assess the current scale and nature of metal contamination of waterways. A priority was to monitor the health of both the local ecology and the marine products consumed and sold locally.

Target beneficiaries

Local fishing communities (especially women, the main bivalve collectors) and bivalve consumers in the Goa region.

Outputs

- Determination of trace metal concentrations in bivalve species exploited by local communities in the mangrove habitats of Goa.
- Reporting on metal concentrations in commercially important edible bivalves, with a view to influencing strategies for monitoring contamination of clam and oyster beds, thus protecting human and ecological health.
- Identification of high-risk zones with high levels of metal contamination, and bringing these to the attention of the relevant authorities.

Accomplishments and challenges

Recent reports have highlighted concerns about dangerous levels of pollution, underscoring the urgency of studies such as this one. Increasing metal contamination of man-



LOCATION

Central West Coast, Goa, India

PRIORITY POWS

Knowledge for Management
Sustainable Livelihoods

DURATION

22 February 2010 to 31 October 2011

MFF GRANT AMOUNT

US\$12,000

Objectives

This project is examining bivalve species to determine the presence and levels of trace metals in their tissues. The targeted species include the clam *Paphia malabarica* and oyster *Crassostrea gryphoides*, two commercially important species harvested throughout the year by coastal communities for consumption and sale.

The project is determining the relationship between trace metal levels and other environmental conditions, and is investigating ways of reducing metal contamination. It is also educating local communities, particularly the women who harvest bivalves, of the risks from contamination, and is disseminating its findings to law enforcement agencies to help them protect the health of people at all levels of the bivalve fishery.

Background

Goa's Central Coast Region has an estimated 20 km² of mangrove forests, an ideal habitat for bivalves that are not only commercially valuable but also a major source of food for poorer coastal communities. The waterways in and around Goa are seriously threatened

grove bivalves poses severe environmental and human health risks.

This study offers scope for replicating metal contamination analyses in a range of aquatic species in similarly affected areas, as well as the potential for stimulating action at regional and national levels to reduce and mitigate the introduction of hazardous contaminants into the marine environment.

Challenges

Collecting samples presents challenges, particularly with oysters which require a special technique to lever them out of their substrate while leaving both shells intact. Also, during the rainy season oyster and clam beds tend to remain submerged under high water levels. In such conditions, local people have to be paid to dive and randomly collect samples for analysis.

Another major challenge facing the team is the reluctance of local people to cooperate

because of fears that the project might prevent them from collecting bivalves in the area.

Contributions to cross-cutting themes

Gender equality

Most bivalve collectors in area are local women. By addressing contamination, the project is helping to sustain their livelihoods and their health.

Lessons learned

The assistance and guidance given by MFF to project design, such as what statistical analyses to use, and how and what socio-economic data should be gathered, has been extremely helpful and should be sought in future projects of this nature.

Lastly communication with local communities is important to enrich the project through their inputs. For university field researchers this may not come easily.

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1.7 Floristic diversity and natural recruitment of mangrove species in selected mangrove habitats of South Gujarat



Research team at Khambhat, Gujarat, India © GEER



LOCATION

South Gujarat, India

PRIORITY POWS

Knowledge for Management
Capacity Building
Coastal Governance

DURATION

30 December 2008 to
31 October 2009

MFF GRANT AMOUNT

US\$14,998

Objectives

This Gujarat Ecological Education and Research (GEER) Foundation project set out to assess the floristic diversity, species richness and recruitment rates of mangrove forests in coastal South Gujarat. It also aimed to examine forest substrata to identify the conditions most favoured by mangroves for their natural regeneration, and to assess local people's dependence on mangroves through a social survey.

Background

Gujarat's 1,650-km coastline boasts the largest area of mangroves on India's western coast (936 km², or 22% of the country's total mangrove area). Yet the status of mangrove habitats in southern Gujarat has never been comprehensively surveyed. Though the region's mangroves are some of the most fragmented in India, they are also thought to have the highest potential for successful reforestation.

For these reasons, GEER, with support from MFF, undertook a study with three teams working on: 1. A physical survey and mapping of mangroves; 2. A survey of floristic

diversity; and 3. A socio-economic survey using a rigorous sampling and research design.

Target beneficiaries

Policy makers and local communities.

Outputs

- A comprehensive survey and mapping of mangroves in South Gujarat.
- An assessment of mangrove species richness and diversity in different habitats.
- The rediscovery of two mangrove species believed extinct in Gujarat (*Bruguiera cylindrica* and *Bruguiera gymnorrhiza*), and the discovery of large populations of the rare mangrove species *Sonneratia apetala* and *Avicennia officinalis*.
- The identification of two new mangrove biodiversity hotspots (the Purna and Ambika estuaries).
- An assessment of the status of natural mangrove recruitment in different areas.
- The identification of different substrata types preferred by various mangrove species for their regeneration.
- A survey of the dependence of local people on mangroves.
- A documentary film in English and Gujarati on the mangroves of South Gujarat.

Accomplishments and challenges

The project covered areas that had never been surveyed before, producing important new findings for long-term mangrove conservation and management.

Two species were returned to Gujarat's existing species list and need to be included

in state plantation plans. To this end, the project worked to raise awareness among forest officers, leading to a decision by the Gujarat Forest Department to launch planting and reintroduction programmes with the rediscovered species.

New areas for mangrove regeneration were identified in Navsari and Valsad districts, and the project submitted proposals to the state government urging it to declare the Purna estuary a mangrove biodiversity hot spot. In a continuation of the project, the GEER Foundation is now involved in creating a GIS database and a herbarium.

Challenges

The challenge now lies in working with the Gujarat state government to ensure designation of the Purna estuary as a mangrove biodiversity hotspot.

Contributions to cross-cutting themes

Communications

The project documented the socio-economic dependence of local communities on man-

grove forests, and presented its findings to the State-Level Steering Committee for the Conservation of Mangroves and Coral in May 2009. The project also produced a documentary film, *The Lesser Known Mangrove Habitats of South Gujarat*, launched on World Environment Day in 2009 by the Chief Minister of Gujarat.

Gender equality

Both men and women were included in the project's socio-economic survey of local mangrove-dependent communities.

Climate change

By giving authorities the data they need to establish new mangrove plantations, the project has helped to increase coastal resilience to the more frequent extreme weather events predicted under climate change.

Lessons learned

The importance of involving local people in survey work became rapidly apparent – fishers assisted researchers by showing them the locations of key mangrove species.

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1.8 Conserving and regenerating mangroves at Mithapur

Women and youth working at Arambda nursery, Gujarat, India © TCSRSD



1980s. The project was designed to embrace all of TCSRSD's objectives, including conservation, empowering women, income generation, community involvement and education.

Target beneficiaries

Local communities, especially women and young people.

Outputs

- ▶ A mangrove nursery established, planting sites identified, and 52,400 mangrove trees planted.
- ▶ The creation of ECO clubs in village schools to encourage young people to become conservation champions and contribute to the project's long-term sustainability.
- ▶ The ECO clubs constructively engaged 2,500 young people in 25 rural schools, familiarizing them with the issues and opportunities of mangrove conservation through awareness and exposure visits.
- ▶ The establishment of self-help groups in local villages to empower women and generate income.



LOCATION

Mithapur, Gujarat, India

PRIORITY POWS

Knowledge Management
Civil Society Engagement
Coastal Governance

DURATION

12 December 2008 to 31 October 2009, extended to 31 December 2009

MFF GRANT AMOUNT

US\$8,000 (MFF)
US\$17,500 (Tata Chemicals Limited)

Objectives

This Tata Chemicals Society for Rural Development (TCSRSD) project aimed to convert just over 12 hectares of barren mudflats to mangrove forest, thus increasing awareness and knowledge of community-based mangrove management, and developing a model for larger mangrove planting programmes in the same area. The project's goals were also to provide alternative livelihood opportunities for local people, in particular disadvantaged women and youth (for example working in tree nurseries), and to set up ECO clubs in village schools.

Background

The Indian chemicals company, Tata Chemicals Limited, through its social arm, TCSRSD, is involved in resource management, environmental conservation, and income generation and health programmes to improve the quality of life at Mithapur, near the Arabian Sea coast where it operates. Tata asked MFF India to help build its capacity in mangrove restoration, with a view to rehabilitating a former mangrove habitat devastated by prolonged drought and overgrazing in the

Accomplishments and challenges

Besides meeting every project goal, MFF India successfully engaged the support of a large corporate partner by building its capacity for conservation and by developing an integrated management approach to coastal conservation. This achievement has kindled interest in cooperating with MFF and IUCN among other companies (for example Hazira port in Gujarat).

The ECO club awareness campaign reached 2,500 students in 25 rural schools. Management of mangrove nurseries created 466 days of employment for disadvantaged women in the project's self-help groups.

TCSRSD plans to scale up project activities by planting a further 162 hectares of mangroves, thus creating extra income for local communities, and is exploring the potential for mangrove ecotourism businesses.

Challenges

The project was delayed by setbacks in acquiring land rights. A study conducted by the National Institute of Oceanography (NIO) found that mangrove planting and establishment of a 50-m buffer zone at the original target site, Charakla salt works, would negatively impact ongoing salt work operations. As a result a new site had to be found and the mangrove restoration site moved there.

At the mangrove nursery site, extra effort had to be devoted to minimize the impacts of algae and seaweed growth, which suffocated mangrove seedlings. Some herders also used the mangroves at the new site for grazing camels, which damaged seedlings at the Arambda nursery. These issues were addressed before the planting began.

Contributions to cross-cutting themes

Communications

The project produced several leaflets and

posters to explain and promote its activities, and presented a report on its findings to the State-Level Steering Committee for the Conservation of Mangroves and Coral in May 2009.

Gender equality

Through the project, TCSRSD became aware of the problems facing local women and responded by proactively establishing self-help groups to empower women and generate income. Training and the mangrove nursery and planting activities generated 466 days of employment for 25 women and disadvantaged young people.

Lessons Learned

The project showed that the corporate sector can play a leading role in demonstrating how development and conservation needs can be balanced.

Another lesson learned was about the need, especially in land restoration work, to ensure that land ownership rights are secured before releasing any funding.

Partners and their contribution

The community work component was implemented by TCSRSD.



ECO Club session, Gujarat, India © TCSRSD

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1.9 Status of shelterbelts along India's southern coast



Rhizophora in Kunhimangalam, Kerala, India © Sourav Singh Deo

forest and absorb or deflect wind and tidal energy. The 2004 Indian Ocean tsunami rekindled interest in shelterbelts and led to increased funding and planting activity. This project was established to meet the coastal planning needs of India's Ministry of Environment and Forests (MoEF).

Target beneficiaries

National and state-level stakeholders with an interest in the conservation and management of coastal ecosystems.

Outputs

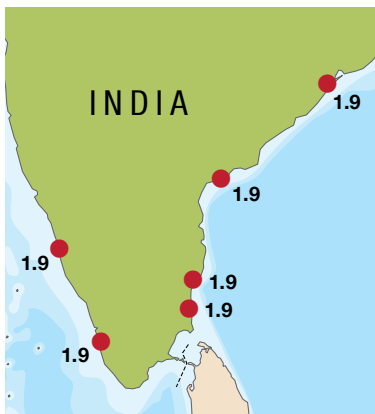
- Production of a comprehensive status report for the states and Union Territory, with details of the spatial distribution of their shelterbelts.
- A review of the various methods being used by state and non-state actors to conserve shelterbelts.

Accomplishments and challenges

A comprehensive survey and mapping exercise of land-use patterns, shelterbelts and other coastal ecosystems was carried out using Land Use/Land Cover (LULC) datasets derived from satellite imaging. The database and maps are proving invaluable to state and central government planners trying to strengthen green coastal defences.

The study also uncovered many instances of participatory shelterbelt management yielding good results, confirming that well-planned and well-managed shelterbelts involving the local community as a whole can minimize the impacts of storm surges, coastal erosion and other environmental processes.

Shelterbelt construction must be well-planned. Care should be taken to avoid destroying natural features such as dunes and wetlands.



LOCATION

Five coastal states (Orissa, Andhra Pradesh, Tamil Nadu, Karnataka, Kerala) and one Union Territory (Puducherry), India

PRIORITY POWS

Knowledge Management
Capacity Building
Community Resilience

DURATION

2 January to 31 October 2009, extended to 31 December 2009

MFF GRANT AMOUNT

US\$22,352

Objectives

This Environment Protection Training and Research Institute (EPTRI) project aimed to collate secondary information on the status of coastal shelterbelts in southern states of India, and to prepare a comprehensive synopsis of the initiatives undertaken by states to conserve and restore coastal shelterbelts in line with their strategies for promoting investment in coastal ecosystems. The project also undertook mapping of shelterbelts and other coastal habitats.

Background

Over three-quarters of the population in the surveyed states live along the coast, putting great pressure on ecosystems there. These coastal zones are also vulnerable to extreme weather events.

In an effort to minimize the loss of coastal habitats, human lives and property, state and non-state actors have created green belt buffer zones, also known as shelterbelts or "bioshields", along the coast. These consist mainly of mangrove or *Casuarina* plantations, designed to augment the remaining natural

Contributions to cross-cutting themes

Communications

The project produced a comprehensive coastal land-use database and maps, and made them available to ministries and other interested parties to help them plan shelterbelts and other coastal conservation work.

Climate change

The project contributed to the sound design, development and maintenance of shelterbelts that will help to mitigate environmental damage from the extreme weather events that climate change is likely to cause.

Lessons learned

This study highlighted the fact that mangrove

restoration efforts led by both the state Forest Departments and by NGOs were most successful when they adopted the Joint Mangrove Management (JMM) model. This is based on a process of participatory rural appraisal and the creation of village-level mangrove committees. JMM ensures greater community participation and ownership, while also guaranteeing a steady, appreciable income to local people. In areas without mangroves, the Joint Forest Protection and Management committees which oversaw the creation and management of shelterbelts were more sustainable.

The location and type of shelterbelt need to be judiciously planned to avoid or minimize any negative impacts on ecosystems, flora and fauna.

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Indonesia

SGF project achievements

The SGF projects in Indonesia focused on community involvement in ways that leveraged participation by respecting local customs, traditions and religion. Collectively, the projects fostered considerable changes in community attitudes towards the importance of mangroves and the benefits of mangrove rehabilitation. All four projects developed useful connections with government authorities active in the fields of forestry, aquaculture, disaster prevention and coastal development.

The necessity of this approach is best illustrated by an example. When Project 2.4 sent its team into villages in Sulawesi, the local population was initially wary of outside interference. The MFF team, through diplomacy and awareness of local customs and social structures, successfully built bridges and, by the project's end, the local community was planting mangroves independently. Moreover, members of the local fisher groups were attending meetings with government officials, something that had never happened before.

In East Java's Brondong district village school, learners had never seen mangroves outside of their textbooks. By the time the project ended they had planted 10,000 seedlings, attended educational gatherings and launched an Islamic-belief-driven mangrove club (Project 2.3).

In Muara Angke, North Jakarta, a project by Jakarta Green Monster introduced a waste recycling initiative. This promoted the message that waste should not be dumped in the river but, if treated properly, could become an asset (Project 2.1). As a result of this project, various small waste recycling

businesses were started.

All the Indonesian projects incorporated sustainability measures. Most of these were deliberately built into the project design; for example, through training in carbon measurement, nursery development and management, and mangrove planting, which provided trainees with the necessary skills and know-how to continue these activities after project completion.

Conclusions

The Indonesian SGF projects were particularly effective in working with local community organisations and leaders to promote broad community participation in project activities, while also helping them to cooperate with the local authorities.

Demonstrating project successes, and imparting technical skills, for example in mangrove planting and environmental monitoring, contributed to sustainability. Equally importantly, they encouraged local participation, which led to the continuation or replication of activities.

Training individuals holding respected positions in local society as facilitators, for example teachers and religious leaders, not only advanced project aims by disseminating information, but also spurred a "word of mouth" community training process.

Involving schools in environmental education, especially Islamic religious schools, and providing hands-on activities for schoolchildren, were key to achieving longer-term impact, particularly when it came to training teachers whose careers and conservation messages will last well beyond a project's life.

SGF INDONESIA PROJECTS

- 2.1** Managing the Angke Kapuk wetland to conserve its natural resources
- 2.2** Rehabilitation and sustainable use of mangrove forests in Pesantren village
- 2.3** *Pesantren* and community involvement in managing disaster risks in coastal areas through mangrove planting
- 2.4** Empowering coastal communities in mangrove forest areas



General location of SGF Phase 1 projects in Indonesia

2.1 Managing the Angke Kapuk wetland to conserve its natural resources

Clean up action by school students facilitated by JGM at Jakarta project site, Indonesia © JGM



LOCATION

Muara Angke, North Jakarta, Indonesia

PRIORITY POWS

Knowledge for Management
Civil Society Engagement
Capacity Building

DURATION

4 May 2010 to 4 July 2011

MFF GRANT AMOUNT

US\$25,000

Objectives

This Jakarta Green Monster (JGM) project aimed to improve the ecological functions of the Angke Kapuk wetland and so conserve important habitats and biodiversity. The project was also designed to develop a participatory community waste management system that will generate extra income for local communities while also conserving the coastal environment.

Background

The Angke Kapuk wetland is an important biodiversity area, particularly rich in birds (90 species have been recorded, with some rare endemics). Many communities living upstream of the wetland are extremely poor and have no access to waste disposal facilities other than the Angke and Ciliwung rivers. The waste they throw into these rivers is deposited in the wetland, degrading the environment and threatening its biodiversity values. By supporting practical cooperation among a wide range of stakeholders, the project sought to raise living standards and reduce pressure on an important coastal habitat.

Target beneficiaries

Members of Kapuk Muara village and students from nearby schools (such as Tarakanita 3 Elementary School).

Outputs

- ▶ The project planted 0.5 hectares of mangroves in collaboration with the private sector, the local community and NGOs, including a religious organization which supported planting in other non-target areas. A subsequent joint survey with the provincial Marine and Fisheries Agency of Jakarta found low survival rates in the arboretum (60%) but encouraging results in the “ecotourism forest” (90%).
- ▶ Monitoring of flora and fauna for the MFF-led national inventory and relevant institutions and stakeholders.
- ▶ Organization of waste clean-up and bird watching events to raise awareness and stimulate interest among adults and students in ecologically valuable local assets.
- ▶ Organization of many community training events on waste sorting and recycling. “Compost for community” mechanisms were established and two paper shredders donated to the local community.
- ▶ Involvement of local schools in making recycled paper products such as business cards and tissue boxes. Training was planned for making charcoal briquettes and recycling plastics.
- ▶ The establishment of a child and visitor friendly waste-sorting centre in the community.

Accomplishments and challenges

The efforts of JGM and MFF have resulted in a much cleaner living environment for the

local community, and have involved learners in developing small recycling businesses. A notorious local “dirty corner” is now a cheerful and colourful village recycling centre, as well as a popular learning and recreation area for families.

JGM successfully engaged businesses, schools and community groups in planting mangroves and raised awareness on related issues. Importantly, the project publicized an asset previously viewed as a problem – waste. Another achievement was engaging and cooperating with the regional authority of North Jakarta in a Joint Working Committee on collaborative waste management.

Challenges

One challenge is what to do with the useful data collected and lessons learned by the project. Such information needs to reach the right people if it is to be disseminated and replicated. Another challenge has been flooding by high tides and unusually heavy rainfall, both of which delayed activities.

Contributions to cross-cutting themes

Communications

Vinyl posters were produced informing the public of recycling activities, and data collected on the flora and fauna in mangrove planting areas were made available. Communication by word of mouth and social networking also proved effective in publicising project events and initiatives.

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Gender equality

Women were well-represented in the project. Fifteen school students, all female, took part in the mangrove monitoring. The women in the “Seven Moms” women’s group were largely responsible for driving the development of recycled goods. Lastly the proportion of women in training events ranged from 25% to 83%.

Climate change

Planting half a hectare of mangroves can make only a small contribution to sequestering carbon. Yet, importantly, even a small stand of mangroves can help to mitigate the impact of extreme weather events related to climate change. Mangroves absorb wind and tidal energy, and have acted as lifebelts for people seeking sanctuary in past disasters.

Lessons learned

Engaging with school students and their teachers proved to have a knock-on effect, drawing in parents, friends and family members.

Working closely with local authorities (in this case the Mayor of North Jakarta and the District Governor of North Jakarta) enhanced project visibility and the sustainability of project outputs.

The project found that documenting and mapping mangrove planting in the form of a “before and after” record is essential. Without it, keeping track of or even determining the survival of planted mangroves is difficult.



Demonstrating skills in producing compost at Jakarta project site, Indonesia © MFF Indonesia

“We will start a business making name cards from recycled paper. Our teacher will help us (maybe she’ll buy some!). But at least now we know that if we treat waste wisely then it can also give us economic benefit!”

— RIA HANDYANI
SCHOOLGIRL (AGE 12)

2.2 Rehabilitation and sustainable use of mangrove forests in Pesantren village

Women beneficiaries planting mangrove trees, Pemalang, Indonesia © Mitra Bahari



project was designed to tackle these issues by demonstrating best practice in managing mangroves and fish and goat farming.

Target beneficiaries

The Mitra Bahari farmers' group, local residents and, through roll-out of best practice models, neighbouring communities.

Outputs

- ▶ A total of 20,000 healthy mangroves raised and planted on 20 hectares of fish ponds.
- ▶ A total of 10,000 black tiger prawns, 4,000 milkfish and four tonnes of seaweed cultivated in two one-hectare eco-friendly demonstration ponds.
- ▶ A goat stable established and 20 goats purchased.
- ▶ Mangrove rehabilitation training conducted over eight days.
- ▶ Communication links established with district government agencies for agriculture and forestry, fisheries, and planning.
- ▶ Educational posters and literature produced.



LOCATION

Pesantren village, Pemalang, Central Java, Indonesia

PRIORITY POWS

Knowledge for Management
Civil Society Engagement
Capacity Building

DURATION

4 May 2010 to 4 April 2011

MFF GRANT AMOUNT

US\$27,046
(from a total budget of US\$27,922 approved by MFF)

Objectives

This project aimed to increase the income of members of the Mitra Bahari farmers' group through mangrove planting (20,000 seedlings in a 20 hectare area of fish ponds), environmentally friendly aquaculture (two hectares of chemical-free demonstration fish ponds) and goat farming. The project emphasised community involvement and skills acquisition and roll-out, and involved over 100 villagers, including women and schoolchildren.

Background

Pesantren village (population 10,000) is no stranger to mangrove planting. Since 2004 over 225,000 mangrove seedlings have been planted there by Wetlands International Indonesia, the local Forestry Agency and other partners. Yet the community still faces serious problems, principally flooding (which is worsened by deforestation and destroys fish ponds), decreasing aquaculture yields due to a history of environmentally unfriendly management (excessive use of chemicals, artificial feeds, and so on), and unsustainable use of mangroves, in particular the heavy use of mangrove leaves as goat fodder. The

Accomplishments and challenges

The project achieved all of its goals: an increase in farmers' income, the establishment of pilot fish ponds to demonstrate eco-friendly best practices, mangrove planting, skills training and the dissemination of educational materials. The only major failure was the death of the black tiger prawns, which proved incapable of surviving flooding.

The project significantly raised the visibility of the Mitra Bahari group, one of whom, Suci Purnami, won second place in the national Youth Pioneer in Marine Area Award. The

judges were impressed by her knowledge of coastal management and ability to measure carbon values in the environment – expertise gained through project training. Milkfish and seaweed from the demonstration ponds have proved resilient to local conditions and fetch higher prices than those produced by non-organic competitors.

Challenges

The main challenge was extreme weather conditions which slowed project work and killed the black tiger prawns.

Contributions to cross-cutting themes

Communications

The project produced 600 brochures explaining its work and two posters that are on display at the Pesantren Village Wetland Information Centre. The brochures have also been distributed to relevant local and regional government authorities and decision makers.

Gender equality

Women were well-represented in all project activities. Of the 101 participants in training sessions, 37 were women. Members of the Wanita Mitra Bahari (Women of Mitra Bahari) group were trained in carbon-measuring techniques and are active in planting man-

groves and making organic fertilizer from goat waste and dead seaweed, both by-products of project activities.

Climate change

Planting 20,000 mangroves was the community's response to climate change adaptation. Healthy mangroves help to mitigate the impacts of extreme weather events, particularly the flooding and high winds that are major problems locally.

Lessons learned

Organically raised milkfish and seaweed help to maintain a healthy local environment (by reducing chemical use) and are profitable ventures. The area is unsuitable for black tiger prawn cultivation, however.

Increasing the community's sense of project ownership is key to achieving sustainability. Also noteworthy are the project's efforts and success in creating a strong sense of unity in the community.

Partners and their contribution

Wetlands International Indonesia has long facilitated capacity building in the village, supported mangrove planting activities, and helped to construct a Village Wetland Information Centre. This served as a meeting point and base for MFF grant activities.



Some of the project participants at Pemalang, Indonesia
© MFF Indonesia

“When we planted mangroves during the high tide event, apart from getting all wet as the water was up to our chests, we also had so much fun. It was more than just planting mangroves – it brought us together.”

— WINASIR
HOUSEWIFE (AGE 35)

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2.3 *Pesantren* and community involvement in managing disaster risks in coastal areas through mangrove planting



Schoolchildren at Lamongan, Indonesia © CBDRM-NU

schools, or *Pesantren*, with 1,500 students in total. The project enlisted their support and the support of the Kyai, a locally influential Islamic leader, in restoring lost mangrove habitat. Its main focus was on educating and involving local children in mangrove planting.

Target beneficiaries

Pesantren students, Brondong villagers and the fishing community.

Outputs

- ▶ Twenty facilitators acquired knowledge on mangrove propagation and planting, coastal conservation, and disaster risk mitigation. Facilitators later transferred this knowledge to community members.
- ▶ An Islamic approach to disaster risk reduction through mangrove planting was adopted with good results.
- ▶ A successful focus on training teachers at the local *Pesantren*, meaning they can now share their knowledge directly with their students.
- ▶ The formation of community groups and the launching of the *Santri* Care for Mangrove Campaign using local media and religious forums to raise awareness.
- ▶ Mangrove planting (7,000 seedlings, 170 participants) and maintenance (3,000 seedlings used to replace others lost to drought, browsing and other factors).
- ▶ Project sustainability guaranteed by engaging local forestry officials in supporting the continuity of project activities.



LOCATION

Brondong district, Lamongan, East Java, Indonesia

PRIORITY POWS

Knowledge for Management
Civil Society Engagement
Capacity Building

DURATION

4 May 2010 to 4 December 2010

MFF GRANT AMOUNT

US\$25,873

Objectives

This project, run by Nahdlatul Ulama's Community-Based Disaster Risk Management body (CBDRM-NU) with MFF, sought to involve *Pesantren* (religious schools) and community members in a mangrove planting programme. The two expected outputs were: 1) knowledge and skills transferred in mangrove nursery management and planting; and 2) the *Pesantren* and coastal community mobilized for conservation.

The process involved recruiting and training facilitators, providing field work for facilitators in disaster risk mitigation and coastal ecosystem conservation through mangrove nursery operation and planting, and supporting a *Pesantren* community campaign for nursery production and mangrove planting.

Background

The site of the project is Brondong in Lamongan, where much of the original mangrove cover has been cleared but local people continue to depend on the coastal environment for their livelihoods.

The community here holds strong religious beliefs and has two Islamic boarding

Accomplishments and challenges

Helping the *Pesantren* community to establish a nursery and plant mangroves has increased the ability of school students and

community members to propagate, establish and maintain mangrove plantations. Prominent local figures became engaged in raising the profile of the project.

The religious approach proved effective. Simply stated, the community will follow any recommendations or suggestions from their Islamic leaders. And, by involving teachers in meeting the project's objectives, the mangrove conservation message was integrated into school and educational activities. Well-trained and well-informed facilitators helped to build and sustain public enthusiasm during this process.

Challenges

The survival rate of planted mangroves was low (50%), one cause being the timing of planting in August when the weather was dry and hot. Foraging by free-ranging goats also caused damage to the seedlings.

Follow-up actions included replacement of dead mangrove seedlings, and consultation with a mangrove expert to determine the best time for planting.

Contributions to cross-cutting themes

Communications

Several Bahasa-language articles covering project progress and activities were published in the *Duta Masyarakat*, *Radar Bojonegoro* and *Zona Berita* newspapers (the lat-

ter is online at www.zonaberita.com), and in other publications, including www.nu.or.id. Local radio coverage and posters were also produced.

Gender equality

Women accounted for 30% to 50% of the participants in activities, including education, lesson sharing, training facilitators, nursery maintenance and mangrove planting. Of the 20 participants in facilitator training, seven were women. Half of those who took part in mangrove planting were women.

Climate change

Planting 10,000 mangroves is the community's response to climate change adaptation. Healthy mangroves help to mitigate the impacts of extreme weather events along the coast.

Lessons learned

Using religion as a catalyst to mobilize community involvement in mangrove conservation proved effective. Facilitators provided an important driving force in the project, acting as messengers and promoters for the Kyai's religious and ecological message.

Partners and their contribution

An in-kind contribution from the Ministry of Education allowed the use of the Community Learning Centre and local radio station.



Santri planting, Lamongan, Indonesia © CBDRM-NU

"If we plant one tree, then the tree grows and has thousands of leaves; all of the leaves will pray to God for those who plant and take care of it."

— KYAI
LOCAL ISLAMIC LEADER AND
HEAD OF THE PESANTREN

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2.4 Empowering coastal communities in mangrove forest areas

Women processing crab meat at Makassar, Indonesia © Hanying Li



Target beneficiaries

Principally the community members of Bira Lantebung and, initially, the fisher groups.

Outputs

- In the project's first quarter 80,000 mangrove seedlings were planted. In the last quarter, 46,000 more seedlings were planted to replace mangroves lost in extreme weather events. The seedling survival rate was about 80%.
- Six mud crab culture cage units were developed and tested by the community.
- Training in mud crab cultivation was carried out using the cage units. This training was later put into practice by developing a mud crab cultivation business.



LOCATION

Bira Lantebung village area, Makassar, South Sulawesi, Indonesia

PRIORITY POWS

Knowledge for Management
Civil Society Engagement
Community Resilience

DURATION

4 May 2010 to 4 April 2011 (extended to 30 April 2011 at no extra cost)

MFF GRANT AMOUNT

US\$25,717
(from a total budget of US\$26,933 approved by MFF)

Objectives

This project sought to increase community awareness of the importance of coastal conservation and mangrove planting, to facilitate mangrove planting action plans, and to increase local incomes by developing a mud crab fishery business.

Another objective was to help Bira Lantebung, a remote community historically distrustful of outside interference, to integrate its needs and interests with state coastal conservation and development interventions.

Background

Most inhabitants of Bira Lantebung live below the poverty line, subsisting mainly on crab and shellfish gathering, farming, and, to a certain extent, factory labour.

The Community Research and Development Institution of Makassar (IPPM) selected Bira Lantebung as a Small Grants Facility (SGF) project site because of its high rate of coastal erosion and severely degraded hydrological regime, the community's low income, the critical state of its remaining mangroves, and the limited local awareness of mangrove rehabilitation.

- The community was actively involved in creating land-use and settlement maps for use in land planning and as instruments of future advocacy by the community. These maps were also shared with local authorities.
- A comparative study tour to Tongke-Tongke village in Sinjai district helped to motivate and raise expectations among community members with regard to restoring their mangroves.

Accomplishments and challenges

Before MFF became involved, the community of Bira Lantebung tended to resist outside intervention. For example, when the local government sent it a truckload of mangrove seedlings, they promptly sent it back. However, after IPPM conducted a sensitive pre-project assessment of local attitudes and feelings, a successful working relationship was established and progress made in improving awareness of the importance of mangroves to local livelihoods.

Overcoming local reluctance to involve outsiders in community affairs was helped by strengthening connections to, government. Engaging government in a dialogue also yielded more support and cooperation. The project and the target area are now also playing host to research studies by the Indonesian and international academic communities.

Challenges

The main challenge was extreme weather which hampered project work, damaged crab culture cage systems, and killed a fifth of the planted mangrove saplings. Despite drawing on local knowledge, the project faced unpredictable and highly disruptive weather conditions.

Involving women was also a challenge, as cultural traditions frowned on women taking part in “physical” activity such as planting trees. They are expected to play a largely supportive role, for example preparing food, mending crab nets, and so on. The project took pains to respect these norms, thus avoiding any potential social conflict.

Contributions to cross-cutting themes

Communications

Many vinyl posters (160), stickers (160), T-shirts (160) and wall calendars (160) were produced to promote the project. A 20-minute documentary DVD of the project

was made in the Bahasa language and distributed to audiences in Makassar. Local newspapers also regularly carried articles about mangrove planting and crab culture.

Gender equality

The targeted fisher groups were all male and only a few women took part in project activities because of cultural constraints. Women joined training sessions to some degree (although their numbers were not recorded), and also benefited from awareness-raising events. They have stated their support for any mangrove rehabilitation activities that respect their roles in the community.

Climate change

By planting 126,000 mangrove saplings, the project will help to increase carbon sequestration locally. Healthy mangroves will also serve to mitigate the effects of extreme weather events linked to climate change (such as flooding and high winds). These are major local problems.

Lessons learned

Adopting a sensitive approach to project introduction paid dividends. In this case, an IPPM team approached the village six months before the project began to familiarize itself with local conditions and attitudes. This proved key to the subsequent success of the project in involving the community and building bridges to other stakeholders.



Bachtiar, head of the fishers group, Bira Lantebung, Makassar, Indonesia © Hanying Li

“Since IPPM began working with us, we have won much more recognition from government. After the MFF training, which involved a local government officer as one of the resource people, four fishermen from our group were invited to join training held by the Regional Marine and Fisheries Agency. This had never happened before.”

— BACHTIAR
HEAD OF FISHERS GROUP

CONTACT INFORMATION

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Maldives

SGF project achievements

Reflecting the economic importance of tourism to the Maldives – a destination associated with clean, near-pristine island environments – three of the five SGF projects aimed to improve waste management and thereby improve understanding among local people of the need to care for their environment. The other two projects sought to improve stakeholders' understanding of the value of healthy coastal ecosystems, including mangroves, using radio broadcasts and videos (Project 3.1), and printed awareness-raising materials (Project 3.5).

Thanks to these projects, a new waste management centre has been established and several existing centres improved. Various publications and communications materials are also available that would not have been existed without the SGF projects. Much of this material is likely to be used over the longer term, either in its present form or after being adapted by other projects.

Although no cases have been reported, it is thought likely that the SGF grantees, including local government bodies and businesses, gained valuable experience and improved their capacities for managing projects of this nature.

Conclusions

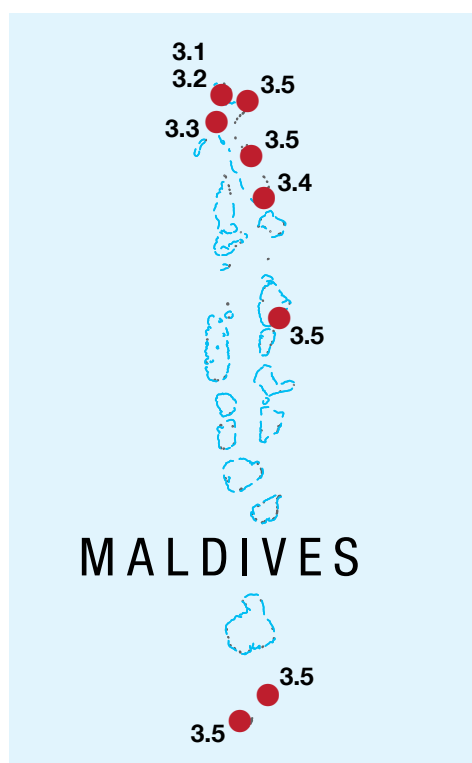
Analysis of the Maldives SGF projects reveals that building partnerships and a common understanding throughout the planning process was a complex and challenging task.

Networking with relevant research and development institutions and funding bodies proved to be vital to the sustainability and growth of projects. As the project supporting radio broadcasts showed, the private sector offers untapped potential for funding, technical support and sharing of results.

The range of awareness materials produced by the projects, including songs and videos, can be incorporated into ongoing and future MFF Maldives activities. These aware-

SGF MALDIVES PROJECTS

- 3.1** Environmental awareness media project
- 3.2** Increasing awareness about waste management
- 3.3** Establishing a waste disposal site
- 3.4** Strengthening the waste management system on Noonu Manadhoo Atoll and greening the island
- 3.5** A print media awareness campaign to protect mangrove habitats in the Maldives



General location of SGF Phase 1 projects in the Maldives

ness materials constitute a public good, so making them freely available (open access) to the public was a positive decision and is to be encouraged as a general principle.

Only a few mangrove stands remain in the Maldives and their importance is not widely appreciated. The information materials on mangroves compiled by one of the projects will be useful for informing a wide range of civil society stakeholders. In terms of impact, it will be important to publicise the existence of these materials as widely as possible so that all interested parties can obtain them.

3.1 Environmental awareness media project



Ahmeed Saleem (right) and his team from DhiFM Radio, Maldives © Hanying Li

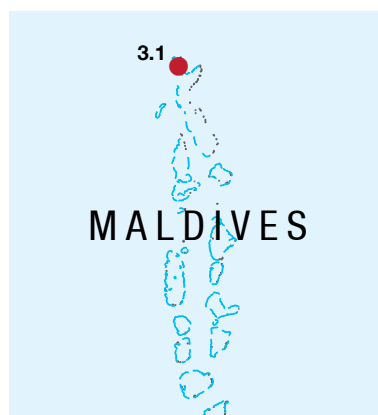
through a popular radio station, DhiFM. It also supported a nationwide environmental awareness campaign through songs and posters. These programmes helped intensify existing environmental awareness efforts in the Maldives.

Target beneficiaries

The programmes were broadly targeted at a national audience, and specifically at residents of Hoarafushi Island.

Outputs

- In all, 17 radio shows were produced plus five environmental songs on video, three video spots to raise awareness, and training on environmental issues for a local radio journalist.



LOCATION

Hoarafushi Island, Haa Alifu Atoll, Upper North Province, Maldives

PRIORITY POWS

Civil Society Engagement

DURATION

Six months from 1 October 2009

MFF GRANT AMOUNT

US\$24,890

Objectives

This project's objectives were to instill an environmental consciousness in people of all ages, to bring to the attention of decision makers the environmental issues that concern people, and to share success stories from island communities to motivate others to try similar activities.

Background

Faced with rapidly changing socio-political conditions, the people of the Maldives have limited time for and awareness of the country's pressing environmental issues. Although the government and NGOs have organized several schemes to raise environmental awareness, many people in outlying islands continue to be left out. Despite the close links between the development of the Maldives and its environment, the country has few cohesive or sustained awareness-raising initiatives aimed at developing people's ability to engage in decision making for sustainable development.

The MFF Small Grants Facility supported three programmes aimed at disseminating information on the importance of mangroves

Accomplishments and challenges

There was a strong response to the radio shows and video spots from the general public. Further, the materials produced by the project are not copyrighted and so available to other broadcasters, NGOs and schools free of charge. The songs and video spots are expected to be broadcast widely on both radio and television.

The materials are also frequently used by school environmental clubs, environmental NGOs, and Scouts and Girl Guides groups during their activities.

Station managers expect the environmental messages in the songs, videos and radio spots to continue to reach audiences for a long time to come. They also expect that, with 17 shows produced and a journalist trained, the radio station will be more sensitive to environmental issues and pay more attention to environmental issues in its daily news coverage.

Challenges

The project originally planned to nominate and second a journalist from DhiFM to an

environmental organization in the region to expose them to environmental issues and challenges. In the end, it proved unfeasible for a short project to arrange an overseas attachment. In consultation with UNDP, it was eventually decided to place a journalist with the Atoll Ecosystems Conservation (AEC) Project in Baa Atoll. With support from AEC experts, a DhiFM journalist spent ten days travelling among islands in the Baa Atoll to learn about the environmental challenges faced by local communities, conduct interviews and collect audio and video materials for broadcasting.

Contributions to cross-cutting themes

Climate change

Coastal zone management is a part of national

policy to support and strengthen adaptation to the impacts of climate change. The Maldives MFF National Strategy and Action Plan (NSAP) reflects many of these considerations and climate-change related actions are mainstreamed in strategic actions, including the SGF projects in the Maldives.

Lessons learned

Looking back at the journalist training experience, project managers feel that modifying the activity benefitted the project more because the journalist was exposed to local issues of greater interest to listeners in the Maldives.

Partners and their contribution

DhiFM made an in-kind contribution valued at US\$10,000.

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3.2 Increasing awareness about waste management



Waste on Hoarafushi Island, Maldives © Hanying Li

Target beneficiaries

A total of 480 households on Hoarafushi Island.

Outputs

- Production of awareness materials, including posters and leaflets on waste management, in the local language and distribution to every household on the island.
- Organization of two workshops on waste management, followed by a third to train residents in producing fertilizers from waste.
- Training of two people from the community to manage waste processing centres.
- Production of metal trays used to burn waste in the waste management centres.

Accomplishments and challenges

There are two waste management centres on Hoarafushi Island, one on either side of the island. These lack a mechanism to deal with excess waste, in particular to manage the “outflow” of waste once the centres have reached full capacity.

The awareness workshops and seminars increased household management of waste, resulting in a lower amount of waste taken to the waste management centres on the island.

Contributions to cross-cutting themes

Communications

The project produced awareness materials in the local language and disseminated them to all target households in the island.

Objectives

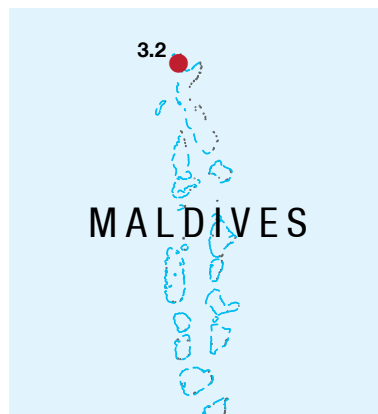
This project's main objective was to protect the target coastal area through better management of solid waste.

Background

Each person in Malé, the capital of the Maldives, produces an average of 0.8 kg to 1 kg of solid waste each day. In the outlying atolls the daily average is 0.3 kg to 0.5 kg per person; on resort islands it is 2.5 kg.

Only 2% of the islands of the Maldives have any system to collect solid waste. Typically waste is dumped in a designated part of the island in an uncontrolled and unmanaged fashion. These dumping sites are usually near the shoreline, allowing waste to wash directly into lagoons. Airborne contaminants from slow-burning waste are also a health concern.

In the Haa Alifu Atoll, waste is transported for disposal on Thilafushi, an artificial island created as a solid waste landfill.



LOCATION

Hoarafushi Island, Haa Alifu Atoll, Upper North Province, Maldives

PRIORITY POWS

Strategies for Management

DURATION

Two years from 1 January 2010

MFF GRANT AMOUNT

US\$10,330

Lessons learned

Properly documenting every event during the project would help to capture learning and identify challenges.

Partners and their contribution

The Hoarafushi School Alumni Association made an in-kind contribution valued at US\$4,830.

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Waste management centre on Hoarafushi Island,
Maldives © Hanying Li

3.3 Establishing a waste disposal site



Waste on Vaikaradhoo Island, Maldives © Hanying Li

houses, creating a breeding ground for mosquitoes. Women clean up the island once a week, burning the refuse they collect, which emits smoke and hazardous fumes. Unregulated dumping is seen as a threat to the environment and a human health hazard.

Illustrious Happening of Arts (ILHAAR) received a small grant from MFF to introduce an effective solid waste disposal system on the island. Established as an NGO in 2005, ILHAAR aims to engage local residents in development issues. Engagement takes the form of sports activities, education and vocational training. At the start of the project ILHAAR had 300 registered members. Together they organize annual events such as celebrations for World Environment Day, sports tournaments, a Youth Challenge programme, and a Visit Vaikaradhoo Sports Festival.

Target beneficiaries

A community consisting of 400 households with 1,800 registered inhabitants. Their main livelihoods are fishing, agriculture and animal husbandry, in particular goat raising.

Outputs

- Construction of a solid waste management centre (completed in October 2009).
- Organization of public meetings and dissemination of leaflets to raise awareness.
- Sharing of project leaflets with other local NGOs, namely, the Vaikaradhoo Initiative for Needed Advancement and the Vaikaradhoo Women's Council.

Accomplishments and challenges

Illustrious Happening of Arts held two meetings with members of the community, and representatives from the Island Office. It also conducted two awareness programmes, one

Objectives

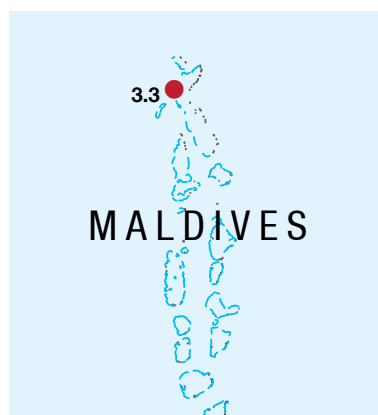
This project's goal was to protect the coastal zone of Vaikaradhoo Island from the harmful effects of unregulated solid waste disposal. Its specific objectives were:

- ❶ to raise awareness about solid waste management;
- ❷ to manage solid waste disposal on the island to protect coastal and wetland environments;
- ❸ to remove and use accumulated waste from the island's waste management centre; and
- ❹ to create employment.

Background

Vaikaradhoo island in Haa Dhaal Atoll is dominated by coastal vegetation, including *Pandanus* spp., Indian almond (*Terminalia cattappa*), sea lettuce (*Scaevola sericea*) and coconut (*Cocos nucifera*). Fringing the island are tall, healthy mangrove stands.

One of the main environmental problems on the island has been the lack of an adequate waste management system. Solid waste is dumped haphazardly around



LOCATION

Vaikaradhoo Island, Haa Dhaal Atoll, Upper North Province, Maldives

PRIORITY POWS

Strategies for Management
Civil Society Engagement

DURATION

Eight months from 15 October 2010 to 30 May 2011

MFF GRANT AMOUNT

US\$11,672

for members of the community in collaboration with the Health Office, and another for students from the secondary school.

Leaflets on three waste management themes were printed and distributed to various institutions and residents.

The solid waste disposal centre constructed by the project has helped to improve waste management and collection, reducing the environmental and health hazards of unregulated dumping and burning.

Challenges

Project managers encountered some financial difficulties during implementation, as well as difficulty in mobilizing stakeholders, especially engaging volunteers.

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Contributions to cross-cutting themes

Climate change

Effective waste management will reduce solid waste, water and air pollution on the island.

Lessons learned

Support from the Vaikaradhoo Island Office proved to be the key to successful implementation of the project. Some flexibility is needed on the part of grant managers to accommodate unforeseen changes on the ground.

Partners and their contribution

The community made a cash contribution of US\$3,892.



The waste management centre under construction on Vaikaradhoo Island, Maldives © Hanying Li

3.4 Strengthening the waste management system on Noonu Manadhoo Atoll and greening the island

Women on Noonu Atoll taking part in a beach clean-up © MFF Maldives



- Organization of five awareness-raising events with 80 participants in total, focusing on environmental issues for community NGOs, the Women's Development Committee and students.
- Planting by community members of over 100 trees across an eroded beach area.
- Installation of five signboards with environmental messages targeted at waste disposal and littering in different locations around the island.

Accomplishments and challenges

The clean-up of the waste management centre at Manadhoo helped to improve conditions there greatly. Project participants sorted the waste at the centre into three categories: solids, liquids and gases.

More community members are now aware of the importance of waste recycling, reuse and composting after an island-wide training programme on waste management. The signboards also positively affected community behaviour, promoting environmental protection activities on the island.

Challenges

The project faced some difficulty in mobilizing stakeholders. Several volunteers withdrew from the project because they saw no financial benefits from its activities.

Contributions to cross-cutting themes

Communications

Promotion and awareness materials helped communicate the importance of waste management to island residents.

Lessons learned

The "Reduce, Reuse, Recycle" house-to-house campaign proved an effective way of achieving the project's objectives.

Objectives

The main objective of this project was to educate women, children and young people about their immediate environment and its interdependence with their health and livelihoods. The project was expected to instill a collective spirit of caring for the environment and encourage participation in efforts to protect and manage the environment.

Background

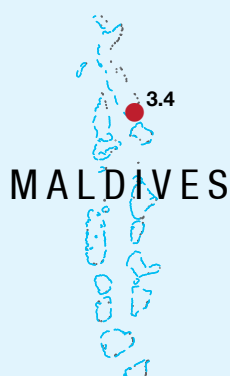
Manadhoo in Noonu Atoll was one of the islands of the Maldives hit by the 2004 Indian Ocean tsunami. The population of the island is about 1,200 people, more than half of whom are under the age of 18. Most residents live on the north-east side of the island, where they have basic utility services but lack systematic waste disposal.

Target beneficiaries

The people of Manadhoo.

Outputs

- Cleaning of the island's waste management centre, beaches, harbour and other public areas.



LOCATION

Manadhoo Island, Noonu Atoll, North Province, Maldives

PRIORITY POWS

Knowledge for Management

DURATION

Six months from 1 October 2009

MFF GRANT AMOUNT

US\$25,000

Periodic awareness-raising and stakeholder mobilization efforts will be needed to keep the island's waste management centre clean.

Lastly, monitoring the project's contributions (such as the trees planted around the beach and the household waste manage-

ment practices) will help to ensure sustainability in the future.

Partners and their contribution

The grantee, Daily New Constructions Pvt. Ltd, made an in-kind contribution valued at US\$2,588.

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3.5 A print media awareness campaign to protect mangrove habitats in the Maldives



Print media awareness campaign, Maldives © MFF Maldives

of mangrove ecosystems means they are widely undervalued.

With better environmental awareness these threats could be managed. By using different forms of highly visible print media, it should be possible to educate people and thereby relieve some of the pressure on mangrove habitats. A media campaign could also influence government to formulate and implement stronger policies to protect and sustainably manage not just mangroves, but also natural resources generally.

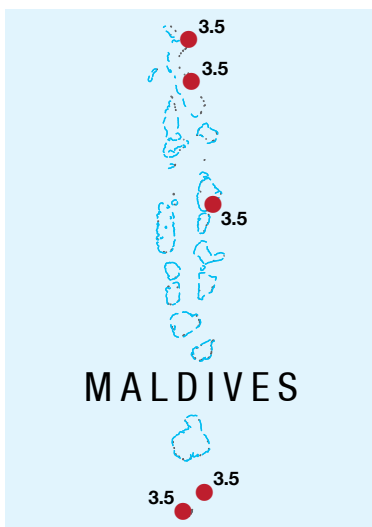
The long-term goal of this project, therefore, was to ensure that the Maldives' mangroves are maintained as healthy ecosystems through stronger, more effective public awareness and policies.

Target beneficiaries

Local communities and NGOs on the target islands.

Outputs

- Compilation of reference materials on mangroves, including field guides, books, study reports, trip reports, assessments and web-based materials and photographs.
- Organization of several field visits to assess the extent of remaining mangroves on the target islands, the threats to and uses of those mangroves, and local people's opinions on protecting important habitats.
- Organization of several stakeholder meetings on public policy trends in protecting, conserving and managing mangrove forests. These meetings also sought to build support for restoring and rehabilitating mangroves by involving communities and island associations.
- Production and dissemination of various printed materials, including posters on



LOCATION

Baarah Island, Haa Alifu Atoll, and Maakandoodhoo Island, Shaviyani Atoll, Upper North Province; Huraa Island, Kaafu Atoll, North Central Province; and Fuvahmulah Island, Gnaviyani Atoll, and Hithadhoo Island, Seenu Atoll, South Province, Maldives

PRIORITY POWS

Knowledge for Management

DURATION

Five months

MFF GRANT AMOUNT

US\$31,500

65

Objectives

The objectives of this project were:

- 1 to collect reference materials on mangrove habitats in the Maldives;
- 2 to visit selected islands to determine the extent of their mangroves, identify the threats to these forests, assess how local people use mangroves, and share knowledge;
- 3 to hold meetings with key government stakeholders to identify policies on protecting, conserving and managing mangrove habitats; and
- 4 to develop awareness materials and disseminate them to island residents.

Background

The mangrove forests of the Maldives play a vital role in sustaining coastal and island ecosystems. Yet they have come under great pressure from population growth and development, in some cases being seen as little more than waste dumps and nuisances. A general lack of awareness of the importance

the importance of mangroves and the need for their protection.

Accomplishments and challenges

The mangrove awareness materials produced by the project gave the MFF country office, UNDP, other NGOs and the Environment Ministry relevant information to share with their stakeholders. All of the printed materials were distributed to the target islands to raise awareness of the importance of mangroves and the urgent need for their conservation and restoration.

The project carried out the first extensive study of mangroves in the target islands, and was able to put together an extensive collection of reference materials on mangroves in the Maldives. These include field guides, books, study reports, trip reports, web-based materials, and a collection of photos.

The project's field work helped to identify the threats to and uses of mangroves in

the target islands, and the extent to which local people value their continued existence. Lastly the stakeholder meetings identified a clear and comprehensive direction for public policy on protecting, conserving and managing mangroves, and gained much-needed support from communities for efforts to restore mangroves.

Challenges

These included a lack of published scientific data and information on the mangroves of the Maldives, the limited time and availability of some key stakeholders, and a lack of awareness in the target islands of the importance of mangrove ecosystems.

Contributions to cross-cutting themes

Communications

The project produced various communications materials such as field guides, books and reference materials.

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Seychelles

SGF project achievements

The SGF projects in the Seychelles contributed to the conservation and sustainable management of specific high-value species groups such as sharks and turtles, as well as to rehabilitating mangroves and conserving coastal environments more generally.

A consistent benefit of the SGF support in the Seychelles was that it revived or accelerated the implementation of good ideas that had stalled. For example, NGOs, government agencies and education stakeholders had been discussing the production of coastal environment school textbooks for some time, but government budget allocations were never adequate or suitably designated for such an initiative. SGF funding fast-tracked the process, allowing textbooks on Aldabra Atoll to be produced (Project 4.1).

A similar situation applied in the case of sea turtle rookeries. Although the Ministry of Environment is mandated to protect sea turtles, it lacks the resources and staff to protect nesting beaches. Through the SGF, a local NGO stepped in to fill the gap and develop sustainable turtle monitoring activities with the help of local community members and the private sector (Project 4.2).

All projects incorporated sustainability considerations into their planning. For example, when the textbooks on Aldabra were printed, a reserve of books was set aside to replace those damaged by wear and tear. A third book combining elements of the two textbooks was put on sale to tourists and locals to raise funds for sustaining the pro-

tection of Aldabra Atoll as a UNESCO World Heritage Site.

The Seychelles Artisanal Sharks Fishers Association (ASFA) now has the equipment, training and catch record sheets it needs to continue collecting shark catch data to help fisheries authorities manage stocks sustainably. A local NGO also built ASFA's capacity to engage effectively with the government's national plan of action for shark conservation, and to make the voices of its members heard by officials and managers.

Conclusions

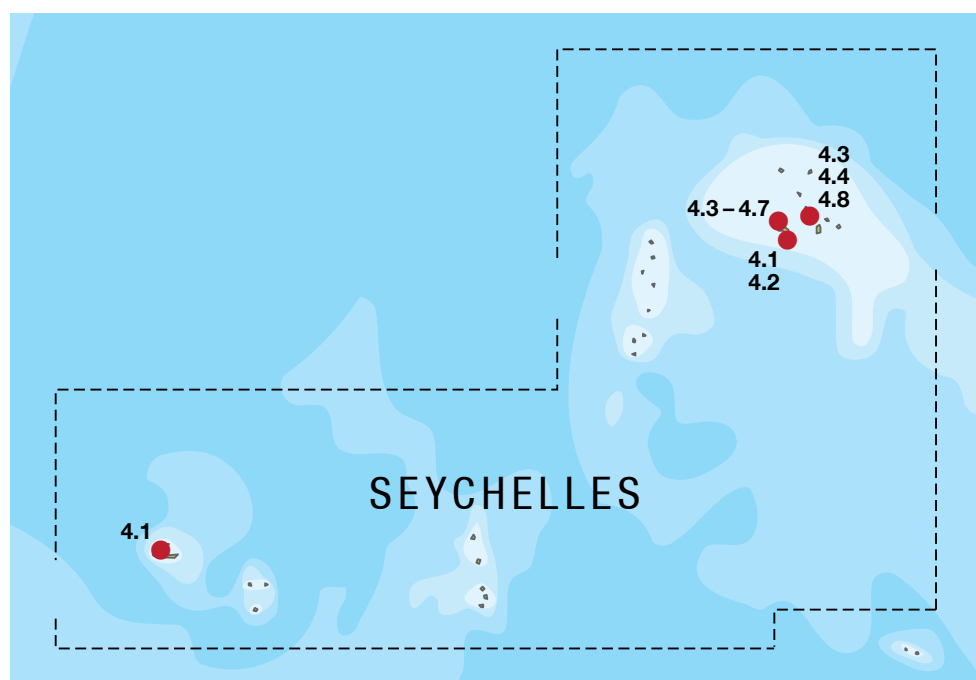
The Seychelles SGF projects provide valuable examples of how to engage and mobilise entire communities, and how to gain the cooperation of key coastal resource user groups such as fishermen and resort operators, in support of environmental conservation issues.

The results demonstrate the value of providing seed money to support small but potentially influential projects. Although the SGF grants were modest, they proved adequate to their ends. The project results generally exceeded expectations, and often attracted additional support from the government and private sector partners.

Involving schools in environmental education and hands-on activities was also key to achieving positive impacts and sustainability; for example, by providing teachers with educational materials which present conservation messages in an engaging format that will be usable well beyond a project's life.

SGF SEYCHELLES PROJECTS

- 4.1** Development and production of two children's educational activity books and a scientific toolkit for the Aldabra Atoll World Heritage Site
- 4.2** Conserving turtle rookeries on Mahé through improved public awareness and community involvement
- 4.3** "Mangroves are a Must!" Promoting mangrove conservation awareness and education in the face of climate change in the Seychelles
- 4.4** Building the capacity of artisanal shark fishers to participate fully and effectively in the Seychelles National Plan of Action for the Conservation and Management of Sharks
- 4.5** Rehabilitation and sustainable management of the North-East Point marsh
- 4.6** Enhancing community participation in sustainable coastal management
- 4.7** Building the capacity of Roche Caiman community to adapt to climate change and other threats
- 4.8** Where did all the soil go? Coastal monitoring as a tool for developing local capacity, raising public awareness and assessing long-term environmental change



General location of SGF Phase 1 projects in the Seychelles

4.1 Development and production of two children's educational activity books and a scientific toolkit for the Aldabra Atoll World Heritage Site



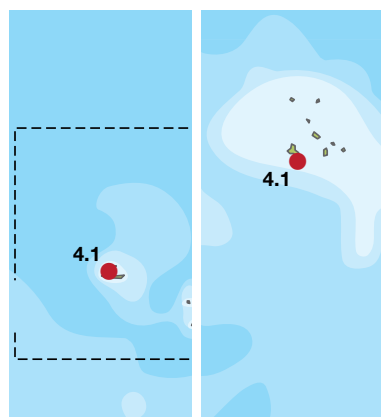
Some of the toolkit materials, Seychelles © SIF

Target beneficiaries

Seychellois students, local communities and foreign visitors.

Outputs

- Two books were completed and their contents reviewed and tested by students and teachers with encouraging results before a nationwide school launch.
- A third book was published and put on sale in bookshops to reach a wider audience and raise revenue for conservation and education.
- The books and other information about Aldabra were put on display at the Vallée de Mai World Heritage Site Visitor Centre on Praslin Island.
- Toolkit activities on Aldabra will begin after the risks from Somali piracy have been addressed and school visits to the atoll resume.



LOCATION

Aldabra Atoll and Mahé, Seychelles, with nationwide distribution

PRIORITY POWS

Civil Society Engagement
Marine Protected Areas

DURATION

July 2009 to March 2011

MFF GRANT AMOUNT

US\$24,139
(actual expenditure was US\$21,969)

Objectives

This project aimed to create an educational pack containing a scientific toolkit for learners visiting Aldabra Atoll and two educational books on Aldabra, one aimed at upper primary students (P4–P6) and the other at secondary students (S1–S5). The publications were designed to give teachers interesting information for students about Aldabra and the activities of the Seychelles Islands Foundation (SIF), the body entrusted with protecting Aldabra, one of two UNESCO World Heritage Sites in the Seychelles.

Background

Although Aldabra is internationally renowned as one of the world's least-disturbed oceanic islands, is designated as a Ramsar Wetland of International Importance, and is home to the Seychelles's largest remaining area of mangrove forests, this "living laboratory" is largely unknown to many Seychellois children. The project sought to fill this important knowledge gap by creating materials that will instill pride in Seychellois youth and kindle an interest in and concern for their natural environment.

Accomplishments and challenges

The books have been well-received, stimulating interest in Aldabra and coastal conservation among children and adults alike.

The Aldabra Children's Book Group (ACBG), which compiled the books, consists of experienced educators, all of whom have visited Aldabra in a professional capacity. They have described the project as a learning experience that enhanced their teaching skills and encouraged them to adopt more flexible and enjoyable approaches.

The books appeal to both children and adults, and have proved to be attractive tools which children can use to learn together with their parents and family members.

Challenges

The main challenges were logistical, principally the difficulty of attracting and keeping

local designers capable of meeting deadlines. Some challenges were beyond SIF's control, for example piracy, which limited access to the island by boat. The conflicting commitments of ACBG members also slowed implementation.

Contributions to cross-cutting themes

Communications

Communication was central to the project, which produced two full-colour, A4-sized books (with 60 pages for the primary school book and 64 pages for the secondary school book). Both books contain guidelines for teachers and parents. A third full-colour book of 28 pages, incorporating elements from the first two books supplemented with newly adapted activities, was produced to appeal to a broader audience.

The project also published an Aldabra toolkit to enrich school visits to the atoll. This contains learning units that can be photocopied, field observation exercises and games that encourage learning and creativity. Newspaper coverage of the project appeared in *The Nation* newspaper.

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Gender equality

The project aimed to educate equally irrespective of gender. The project team was composed entirely of women.

Climate change

Education about climate change issues is built into the educational material, particularly in the research section which illustrates the importance of long-term monitoring projects and Aldabra's status as a global benchmark. Issues such as coral bleaching and sea level rise are also fully addressed in a local and global context.

Lessons learned

It is important to identify consultants who can deliver on time and ensure that their contract is fully understood and respected. Incentives such as bonuses for prompt delivery are helpful but must be documented so that all parties fully understand their obligations and adjust their schedules accordingly. Another lesson is that designing educational materials for children takes considerable time and thought. Project outcomes should not be compromised by a too-ambitious time frame.



Students test the Aldabra toolkit, Aldabra, Seychelles
© B.Andimignon

“This was a great learning experience for me, despite my many years in the teaching profession. I saw my old-style methods adjusted into a very interesting, interactive and fun style of learning, opening my eyes to more effective education. This led me to design an Aldabra board game with lots of ideas in it and I am so proud of this accomplishment.”

— DORA ERNESTA
ACBG'S MOST-EXPERIENCED
EDUCATOR

4.2 Conserving turtle rookeries on Mahé through improved public awareness and community involvement

Relocating a turtle nest, Mahé, Seychelles © MCSS



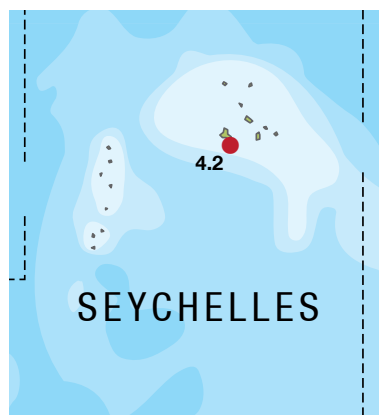
nests from deliberate or accidental interference. Contributions from the private sector (particularly tourism businesses) in the form of sharing benefits with the community will help to ensure project sustainability.

Target beneficiaries

Members of turtle monitoring groups (at the end of the project these numbered six men and seven women), hotels on nesting beaches, and interested community members.

Outputs

- Increased rates of nesting success at the selected priority turtle rookeries.
- Local monitoring and management projects established on key nesting beaches.
- New partners and funding sources identified to support management of turtle rookeries.
- Enhanced public awareness of “turtle-friendly” and “turtle-unfriendly” practices.
- Establishment of management and monitoring mechanisms in cooperation with appropriate authorities and landowners.
- Launching of a nationwide awareness campaign.



LOCATION

Ten beaches in southern Mahé, Seychelles

PRIORITY POWS

Knowledge for Management
Strategies for Management
Civil Society Engagement

DURATION

Expected to run for 18 months from July 2009, but because of some administrative delays ended in May 2011

MFF GRANT AMOUNT

US\$24,950

Objectives

The goal of this Marine Conservation Society Seychelles (MCSS) and MFF project was to identify, monitor and rehabilitate priority sea turtle nesting beaches on Mahé in collaboration with local communities, businesses and government. The project also aimed to raise the awareness of local people and foreign visitors about turtles and turtle conservation in the Seychelles.

Background

Mahé is the administrative hub of the Seychelles and the most developed island in the archipelago. It is also a favoured nesting area for globally important numbers of endangered hawksbill and green turtles. Once numerous, these turtles are now much reduced and, despite the protection offered to adult turtles, their rookeries are threatened by human disturbance. The Ministry of Environment is mandated to protect sea turtles but has only a limited operational budget, preventing it from devoting sufficient attention to key nesting beaches. This project aimed to support government policy and enlist the help of the local community in protecting

Accomplishments and challenges

The project successfully encouraged local communities, individuals and businesses to take responsibility for their beaches. Project interventions included training people in monitoring techniques and developing a protocol for reporting any unusual activity, for example poaching, or emergencies, such as injured turtles or females laying eggs in areas where they would be at risk.

Six new cooperative monitoring projects were established. Of these, three proved sustainable and have continued beyond the end of the project, each project group caring for one beach. In four cases, nests were moved away from high-risk areas, allowing the emergence of more than 300 healthy hatchlings that would otherwise have perished.

Challenges

The project suffered some delays, most notably in the nationwide awareness campaign which had to be suspended until the pre-campaign turtle survey was completed (this delay was due to limited local capacity). The campaign was eventually (and successfully) launched in February 2011.

Contributions to cross-cutting themes

Communications

The project received good media coverage, with six newspaper articles published covering turtle issues. The project produced turtle awareness leaflets, an eight-page colour booklet with advice on turtle conservation for beachfront property owners, a brochure giving the public advice on how they can help protect turtles, and a signboard in four languages. The project also organised a poster competition at four coastal schools on the theme of how to save sea turtles and whale sharks. The winning designs were printed on T-shirts and distributed to the schoolchildren.

Gender equality

Participation in the project suited people who were not at work all day or who could contribute a few hours of their spare time. Both men and women took part in the project; its staff members also included men and women.

Climate change

Variations in temperature affect different stages of the sea turtle's life cycle – from the nest temperature which determines sex in the turtle embryo, to changes in sea temperature which influence and dictate foraging areas, to climatic changes which determine the availability of nest sites. The project took measures to ensure suitable temperatures for egg development, for example by rehabilitating beaches to provide the levels of shade needed to yield a favourable ratio of male and female embryos. Eggs laid in dangerously eroded areas were also relocated. Lastly the monitoring data produced by the project were fed to national initiatives monitoring climate change.

Lessons learned

The project has shown that the best way to achieve success is to involve local stakeholders and listen to their comments. Future interventions of this type must provide regular feedback and reinforcement for project outputs to ensure stakeholders stay active and committed.

Project communication needs to be comprehensive and regular – leaving participants “in limbo”, even when assuming they know what is happening, is a mistake and leads to disaffection and ineffectiveness.

Partners and their contribution

In-kind support and facilitation were provided by the Seychelles government (Department of Environment, Department of Education, Hotels Association and Seychelles Tourism Board), private sector (Banyan Tree Resort, Chalets Anse Forbans and Four Seasons Resort) and civil society (Wildlife Clubs of Seychelles).



Community sensitisation on nesting turtle sites at Takamaka, Mahé, Seychelles © GEF SGP

“The project sensitized the general public to the issues facing the remaining turtles and educated them on how they can help to protect and enjoy these incredible creatures.”

— GEORGIA FRENCH
MCSS PROJECT COORDINATOR

CONTACT INFORMATION

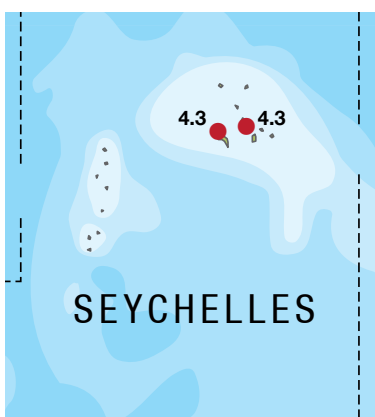
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4.3 “Mangroves are a Must!” Promoting mangrove conservation awareness and education in the face of climate change in the Seychelles

Puppet show about conserving wetlands, WCS festival, 2010, Mahé, Seychelles © MFF Seychelles



LOCATION

Mahé and Praslin islands, Seychelles

PRIORITY POWS

Knowledge for Management
Strategies for Management
Civil Society Engagement

DURATION

July 2009 to February 2011

MFF GRANT AMOUNT

US\$25,000

Objectives

The overall objectives of this Wildlife Clubs of Seychelles (WCS) project were to overcome negative or indifferent attitudes to wetlands and mangroves, and to bring about a change in societal priorities in the Seychelles.

Background

As many Seychellois are largely unaware of their values and services, wetlands continue to be lost and degraded, destroying important wildlife habitats and making the archipelago increasingly vulnerable to the extreme weather events induced by climate change. This project sought to launch a vigorous long-term campaign of public sensitisation aimed at encouraging the whole community to take action to conserve wetlands.

Target beneficiaries

Members of six coastal communities, the private sector, and WCS members (224 people) and leaders (10 people).

Outputs

- The establishment of six “Mangrove Teams” to implement project activities in

each target community, including mangrove planting.

- Establishment of outdoor classrooms in wetlands to teach wetland restoration techniques, and organization of many indoor conferences and lectures.
- Organization of eleven youth leadership training sessions, after which trainees led similar sessions in their communities.
- Launching of the “Art to Educate” campaign in three regions, involving the creation of prominent roadside murals on wetland themes.
- Creation of an “Adopt a Wetland” scheme whereby people or businesses can commit to protecting their “own” wetland.
- Launching of a countrywide media campaign.

Accomplishments and challenges

The project involved WCS leaders and members, schools, the wider community, media outlets and national stakeholders in government and the conservation field, helping to raise awareness of the importance of wetlands and generating information on mangrove planting and restoration.

A survey that assessed community appreciation of coastal resources in the six target communities found that 96% of respondents regarded wetlands as valuable assets. The survey prompted community members to look at the benefits from healthy wetlands, and encouraged activities to protect wetlands in their vicinity. A partnership between government and stakeholders was established, and even after the project ended activities in wetland protection and restoration continued.

The Mangrove Teams drew praise from

key stakeholders such as the Department of the Environment, as well as certain communities which have now registered as organizations in their own right and are applying for funding to expand their efforts.

Challenges

Two of the Mangrove Teams implemented only part of their action plan because of ill health and other commitments. The WCS coordinator also occasionally found it hard to monitor every ongoing project.

Contributions to cross-cutting themes

Communications

Media coverage of the project was excellent. *The Nation* newspaper ran six articles, five of which mentioned MFF. A 15-minute radio programme and many shorter updates were broadcast on project activities, as well as a 20-minute television report and shorter updates of about seven minutes each.

The project also produced posters detailing community survey results, an annual 24-page magazine for children, and a 65-page book, *A Wetlands and Coastal Activities Guide*.

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Gender equality

More than 90% of the WCS leadership is female; about 70% of its membership are women.

Climate change

This was a project focal area and a motivating force for mangrove rehabilitation. Training was given to WCS members in climate change, its potential impacts on islands and coastal communities, and other relevant concerns. The training included film shows, group work, art and drama. These activities were later rolled out to schools.

Lessons learned

Given its scale, this project would have benefited from a dedicated project manager. Outputs were best achieved by training all participants in implementing and managing action plans, writing reports and other management tasks. Decentralizing implementation also worked well.

Partners and their contribution

Almost all Seychelles conservation organizations, as well as government ministries, contributed to making the project a success.



Mangrove site restoration by WCS club members, Mahé, Seychelles © Wildlife Clubs of Seychelles

"It is good to see the young people taking interest. I have never seen it before. I will help them by looking after the plants they planted here."

— MRS VERLAQUES
A COASTAL VILLAGER

4.4 Building the capacity of artisanal shark fishers to participate fully and effectively in the Seychelles National Plan of Action for the Conservation and Management of Sharks



Artisanal shark fisher, Seychelles © MFF Seychelles

the shark catch, but that their lack of capacity poses an obstacle to implementing the plan successfully. This project was launched to remedy this deficiency and engage the ASF in achieving the NPOA's goals.

Target beneficiaries

Artisanal Shark Fishers (ASF), the Artisanal Shark Fishers' Association (ASFA), and the NPOA steering committee.

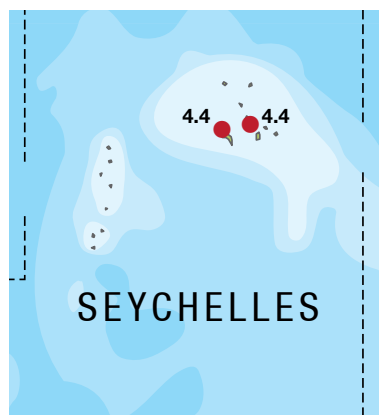
Outputs

- Formation and registration of the ASFA to facilitate information sharing and full ASF representation on the NPOA steering committee.
- Development of a Creole language shark identification key and a standardized shark catch data form.
- Purchase and distribution of data collection equipment to ASF. The resulting data are compiled and managed by fishery authorities.
- Media coverage of the project, as well as the NPOA and MFF.
- Enhanced public awareness of the important ecological role played by sharks through media coverage, posters and pamphlets.

Accomplishments and challenges

The ASF are now equipped to collect catch data essential for informed shark stock management, and have a formal presence in the NPOA enabling them to voice their opinions and concerns.

Over time, trust was built between the project and ASF, who played a role themselves in developing the project. This collaborative approach reassured them that their interests would be represented and that



LOCATION

Central Archipelago, Seychelles

PRIORITY POWS

Knowledge for Management
Civil Society Engagement
Coastal Governance

DURATION

Fifteen months beginning in July 2009. Activities were temporarily halted after the GIF general manager resigned in October 2009, but resumed in May 2010. The project ended in May 2011.

MFF GRANT AMOUNT

US\$7,165

Objectives

This Green Islands Foundation (GIF) project aimed to support implementation of the National Plan of Action for the Conservation and Management of Sharks (NPOA) by building the capacity of Artisanal Shark Fishers (ASF) to fulfil their role under the plan, thereby safeguarding their livelihoods and ensuring a healthy and productive coastal ecosystem for the broader artisanal fishery industry, local dive operators and other stakeholders. The project also sought to enlist the cooperation of ASF in gathering shark catch data, and to promote public awareness of the ecological importance of sharks and wise use of marine resources.

Background

A healthy shark population in the 32,000 km² expanse of the Seychelles mid-oceanic plateau is central to maintaining a balanced and productive coastal ecosystem that benefits all stakeholders, both consumptive and non-consumptive. To this end, the government of the Seychelles launched the NPOA in 2007 to ensure sustainable fishing practices. The NPOA recognises that ASF play a key role in

they would be an integral part of any marine resources management plan.

Challenges

The main challenge was the resignation of the GIF's general manager to take up a full-time post with an international agency. He later agreed to resume his GIF work voluntarily.

Another challenge was that the creole shark identification key could not be completed within the project period. In some cases, fishers from different areas use different names for the same shark species, and it takes time to catalogue and reconcile these local variations.

Contributions to cross-cutting themes

Communications

An active blog (<http://greenislandsfoundation.blogspot.com>) published news of the project's progress. *The Nation* newspaper and national television in the Seychelles also covered the initiative. Educational posters focusing on sustainable shark management and shark facts were produced.

Gender equality

The ASF are exclusively male but support their families directly. In future, ASF spouses

will be involved in co-managing ASFA activities.

Climate change

The project contributed to maintaining an ecologically balanced and productive coastal ecosystem, which should in turn be more resilient to the impacts of climate change.

Lessons learned

The project has shown how a small amount of seed money can be used to realize (and support further) national objectives. Project sustainability needs to be a priority. In this case, the ASFA is already forming partnerships with other agencies, is looking to secure funding, and is fully engaged with the NPOA.

Partners and their contribution

The Seychelles Fishing Authority and NPOA Steering Committee of the Seychelles government provided in-kind support. From civil society, the Praslin Fishers Association provided in-kind support and GIF provided administrative and logistical support. From the private sector, the Indian Ocean Lodge Hotel supplied discounted accommodation on Praslin Island. Mr John Nevill acted as volunteer project manager.



Shark fishers discussing project progress with GIF project manager, Mahé, Seychelles © MFF Seychelles

“The MFF project helped us to form an association so that we can work together to protect our fishing rights and use our knowledge to better manage our fishery.”

— CLIFFORD BAMBOCHE
THIRD-GENERATION ASF AND
MEMBER OF ASFA

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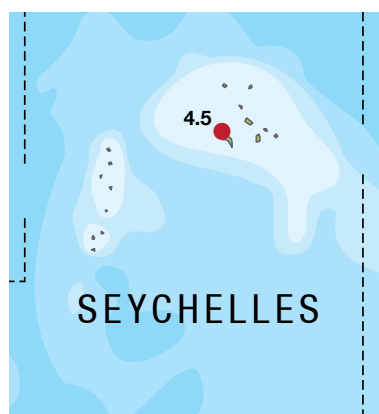
4.5 Rehabilitation and sustainable management of the North-East Point marsh

Radio programme on site with SSA members, Mahé, Seychelles © MFF Seychelles



threatened by invasive plant species, principally the water lettuce (*Pistia stratiotes*) and water hyacinth (*Eichornia crassipes*). Both species spread quickly, blocking sunlight and depleting the water of oxygen, thus affecting endemic plant and animal species. They also reduce the aesthetic values of wetlands.

This SSA project aimed to address the negative effects of development projects, unsound business practices and the spread of invasive plant species on Mahé's North-East Point marsh. The project was designed in line with national policies, as the Department of Environment is actively involving various groups, especially young people, in protecting the marsh and educating people about its values. The marsh has social and economic value because it is near a popular beach. It also has potential for ecotourism, and provides habitats for a number of endemic plant and animal species.



LOCATION

North-East Point, Mahé, Seychelles

PRIORITY POWS

Knowledge for Management
Civil Society Engagement
Capacity Building

DURATION

One year

MFF GRANT AMOUNT

US\$11,900

Objectives

This project had three objectives:

- 1 to control water lettuce and other invasive plant species threatening the endemic terrapins, fish and plant species of North-East Point marsh;
- 2 to enhance partnerships between NGOs, government and the community for conducting environmental activities; and
- 3 to engage Seychelles Scouts Association members in tending, survey and research work, and in sensitizing the local community to the management and conservation needs of North-East Point marsh.

Background

Wetlands are a critical ecosystem in the Seychelles. The Department of Environment (DOE) and the Seychelles Scouts Association (SSA) understand the need to conserve wetlands, which, despite their known importance, are under constant threat from human activities as competition for land intensifies. Moreover, the marshes of the Seychelles are

Target beneficiaries

The direct beneficiaries were 25 Scouts, both boys and girls, two Scout leaders, two programme coordinators, and three casual labourers from the district. Indirect beneficiaries included the small community next to the marsh, the Scouts network, and the DOE.

Outputs

- Clean-up of the North-East Point marsh and subsequent maintenance of the wetland to prevent growth of water lettuce and water hyacinth.
- Involvement of the people from the project district in the management of the marsh.
- An inventory (number and types) of plants and animals found in the marsh.

Accomplishments and challenges

The project introduced young Scouts members to environmental management activi-

ties and conservation values. It provided a venue for the newly introduced environment component in scouting (especially in the Seychelles). The Scouts and their leaders had the chance to speak with local people about how unsound business practices were negatively affecting the wetland ecosystem, a new experience for Scouts in the Seychelles.

Although the project team was small, it managed to delegate work on a rotational basis while ensuring consistency and adequate monitoring of the project. A local person from the community helped the young Scouts each time they visited the site. Staff from the DOE provided effective support, and participants were motivated throughout and alert to special features or species in the wetland.

Challenges

The group fears that if they do not visit often, the marsh could again become a community waste dump. The timing between site works was also a concern for the Scouts leadership, DOE and the MFF NCB, as invasive plants grow quickly and fill the marsh with debris faster than they can be cleared. The SSA hopes that the community awareness campaign will help reduce these threats. The Scouts are also organizing other community-based groups such as the Wildlife Clubs of Seychelles to join them in sustaining their effort.

Contributions to cross-cutting themes

Communications

A documentary is being filmed about the project, and SBC radio broadcasted a programme entitled *The North-East Point Wetland*, a 20-minute report aimed at raising awareness about the wetland and why the Scouts were restoring and maintaining the site. An information brochure on the importance of wetlands, the Scouts' environment programme, and partners in conservation,

was also produced. The brochure includes information on the MFF project, and how the project contributes to the important wetlands in the area.

Gender equality

The Scouts leadership and membership are a mix of men and women, including children of both sexes and all age groups.

Climate change

The work begun by this project marks the start of a longer-term action to ensure the marsh functions naturally for the benefit of both wildlife and the surrounding community. Wetlands remain a critical ecosystem, which if healthy can greatly reduce some of the impacts of climate change.

Lessons learned

This project was a holistic venture for Scouts members, as it allowed them to learn about and benefit from the experience of professionals in the field, as well as join workshops that broadened their theoretical understanding of wetlands and their functions. The Scouts learned techniques for maintaining ecologically important sites and for social research and data collection (such as the inventory of flora and fauna in the marsh, raising community awareness through discussions, and local site visits).

Close collaboration with the community yielded positive results, but one of the planned results (no invasive plant species in the marsh) proved over-ambitious. Project managers found that the aggressive growth of invasive weed species makes them extremely difficult to eliminate.

Partners and their contribution

The Seychelles Department of Environment made an in-kind contribution through facilitation, consultation, guidance and equipment (as stipulated in the Memorandum of Agreement signed at the start of the project).



Starting control of invasive weeds at North-East Point marsh, Mahé, Seychelles © SSA

"This was the first time that our environment project received financial support from MFF. It was a great help for us in responding to our principles, especially in providing opportunities for us to connect to the natural world through environmental education and on-the-ground action."

— FRANCIS ACCOUCHE
SSA COORDINATOR

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4.6 Enhancing community participation in sustainable coastal management

S4S, community members and hotel staff clean and restore mangroves, Port Gland © E. Talma, S4S



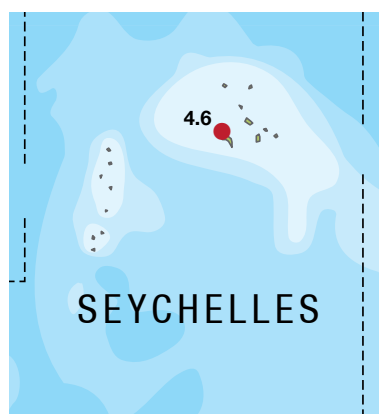
built between the beach and the mangrove swamp, and was expected to open in early 2010. This project sought to help the residents of Port Gland work together with the resort and other local partners to develop a sustainable community development plan to take advantage of the increased tourism traffic, improve livelihoods, and at the same time protect and enhance the area's coastline and cultural heritage.

Target beneficiaries

Residents and stakeholders in Port Gland.

Outputs

- Establishment of a community-based organization (CBO) in Port Gland to lead the process of sustainable development.
- A sustainable management plan written by and for the community.
- Increased public awareness of the importance of natural and cultural heritage sites.
- Increased public participation in sustainable development activities.
- A survey report comparing community attitudes, awareness and involvement at the beginning and end of the project.
- Education and awareness materials to promote coastal management and training for stakeholders and to share with other communities.



LOCATION

Port Gland, Mahé, Seychelles

PRIORITY POWS

Knowledge for Management
Civil Society Engagement
Sustainable Livelihoods

DURATION

One year

MFF GRANT AMOUNT

US\$24,500

Objectives

This project had three objectives:

- ❶ to increase public participation in environmental planning and management, and improve networking between the community, a resort and other stakeholders;
- ❷ to improve people's awareness and appreciation of their natural and cultural heritage, as well as the risks from climate change and unsustainable development; and
- ❸ to help the community explore new ways of generating sustainable income from wetlands and other natural and cultural features

Background

Port Gland is a district on the north-west coast of Mahé, the main island of the Seychelles. It has a rich cultural and natural heritage, including a Ramsar-designated mangrove swamp and several sites of historic interest. At the time this project was proposed, a large five-star resort was being

Accomplishments and challenges

Through the project, the grantee Sustainability for Seychelles (S4S) brought together residents of the community to identify important local features, brainstorm challenges and opportunities, and develop an action plan to improve the environment, community life

and the local economy. Participants also produced a community map.

Different generations were able to share their perspectives of the community and how to work with government and private sector partners to improve the district. A presentation of the results of a community survey conducted by local youth with S4S impressed stakeholders, and the results were used in planning the development of small eco-businesses.

The main success of the project was the close collaboration of all partners concerned. S4S worked closely with the management of the new resort, successfully bridged the gap between them and the community. The resort has now opened its doors to the community for visits, and also strongly supported project activities.

Challenges

Until a local leader could be identified to coordinate project activities, S4S staff had to play this role. This proved challenging given the distance to Port Glaud from the S4S head office.

Contributions to cross-cutting themes

Communications

Project activities were documented using print and broadcast media. The Seychelles Broadcasting Corporation (SBC TV) aired a seven-minute report on mangrove planting by Port Glaud residents and resort staff. A two-page article in a local magazine featured local people's active role in protecting and improving the environment, especially within

their own communities. The article mentioned both of the MFF SGF projects directly working with community-based initiatives in the Seychelles.

Gender equality

Both men and women participated in the project at the community and resort levels. The local youth group also has a mixture of boys and girls, and the new CBO is open to both male and female membership.

Lessons learned

Although the community is more engaged in environmental action, it needs a facilitating organisation like S4S to help it organize and communicate with the resort and other partners.

Having a neutral body like S4S facilitate dialogue and collaboration between stakeholders with different interests in a development project like a large resort can be extremely useful, particularly in its early stages.

Partners and their contribution

UNDP GEF contributed US\$40,000 in co-financing. The Seychelles Department of Environment contributed to project management and activities, and in-kind contributions were made by the Port Glaud District Administration. Other organisations that made in-kind contributions or support project activities included Port Glaud School, the Small Enterprise Promotion Agency, and the Seychelles Heritage Foundation. From the private sector, the Ephelia Resort at Port Glaud made both cash and in-kind contributions.

"The MFF small grant is enabling community members of all ages and partners to learn together and to decide what is best needed for the sustainable development of their community in fun, interactive and participatory ways. Thanks for the guidance and the funding for the project. It is getting very exciting and we are glad that other partners find an interest in the programme."

— MICHELE MARTIN
PROJECT COORDINATOR, S4S

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4.7 Building the capacity of Roche Caiman community to adapt to climate change and other threats



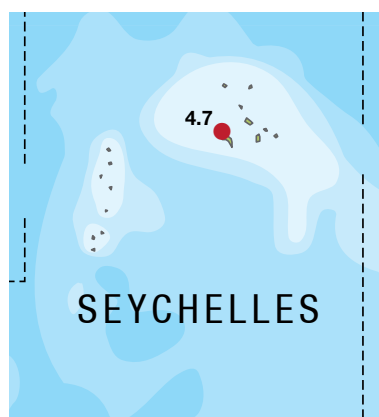
RCEAT-hosted mangrove planting, Roche Caiman, Mahé © MFF Seychelles

the event of a natural or other disaster. A programme addressing healthy ecosystems is important to this community, and so this project was designed to build local capacity to react to changes that may affect environmental security and well-being.

The project addressed the issue of climate change, providing community members with opportunities to learn about potential hazards and risks related to climate change that may affect their livelihoods and property.

Target beneficiaries

The main beneficiaries were community members in Roche Caiman, Zone 1, including local youths trained to run education and awareness programmes.



LOCATION

Roche Caiman, Mahé, Seychelles

PRIORITY POWS

Civil Society Engagement
Community Resilience
Coastal Governance

DURATION

One year

MFF GRANT AMOUNT

US\$8,000

Objectives

This project had four objectives:

- 1 to organize community groups for planning and implementing project activities, and ensure these continue to function after the end of the project;
- 2 to train group leaders and the project team in leadership skills, effective project management, and reporting;
- 3 to build local knowledge of environmental issues, including climate change and disaster risk reduction; and
- 4 to improve community awareness, understanding and engagement for project activities, in particular building a culture of safety and resilience.

Background

A recent survey by the Seychelles Department of Risk and Disaster Management identified Roche Caiman, a district built on reclaimed land about one metre above sea level, as an area of medium to high risk in

Outputs

- Establishment of a highly motivated project team to represent the community and work collaboratively with target beneficiaries.
- Capacity of project team built to better understand issues related to project implementation and community engagement.
- Organization of community activities in environmental awareness, coastal restoration, and other learning topics.

Accomplishments and challenges

This was Roche Caiman's first donor-funded project, and community members incorporated MFF into their social life, including sports and cultural events. They used an evening cultural show to promote the work of MFF, and to thank community members participating in the project.

The project also helped the Roche Caiman to identify other needs in the community, such as a secure and safe path for

pedestrians. The community intends to sustain the project by working alongside businesses in the area, and by applying for further funding from the UNDP GEF Small Grants Programme.

During the process of planning and designing this project, a new community-based organization (CBO) was created with the help of MFF. The CBO looks after the work started by the school's wildlife club mangrove project, and works in collaboration with other partners to restore nearby sites. The CBO was used as a model for replication by Port Glaud district when it set up its own CBO with the help of another SGF project implemented by grantee S4S.

Challenges

At the start of the project, the scheduling of some activities clashed with other community commitments and events. Once a dialogue was established with the community, project activities ran more smoothly.

Contributions to cross-cutting themes

Communications

Posters and brochures advocating Roche Caiman as a climate change-ready community were produced through school art competitions.

CONTACT INFORMATION

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Wof2004@hotmail.com

Gender equality

Both men and women participated in the project, but women commonly took the lead in project activities.

Climate change

The theme of "Roche Caiman is adapting to climate change" was adopted for all project activities, and a video and oral presentation on climate change widely given at the beginning of the project. The project also organized mangrove and other coastal tree planting events, and held meetings with families in the community to discuss climate change.

Lessons learned

The project initially targeted Zone 1 of Roche Caiman. As the project progressed, however, managers discovered that all three zones of the community were equally interested and involved in implementation. This creates the possibility of further expansion and consolidation of outputs in the post-project period.

Partners and their contribution

The Seychelles Department of Environment made in-kind contributions to organizing and supporting tree planting activities. The Department of Community Development and National Youth Council made in-kind and cash contributions to project activities.



Handing over of Wetlands & Coastal Activity guide to Roche Caiman administration, Mahé © MFF Seychelles

"This grant is giving us many innovative ideas of how to involve community members in small projects and activities, building their capacity to implement, manage and report on external funds, and so developing a sense of ownership for all projects benefiting all of us in the small community of Roche Caiman."

— WILBURT OMATH
ROCHE CAIMAN DISTRICT
ADMINISTRATION

4.8 Where did all the soil go? Coastal monitoring as a tool for developing local capacity, raising public awareness and assessing long-term environmental change

MrVictorin Laboudallon explains project site work to children, Praslin, Seychelles © MFF Seychelles



The project sought to develop a framework for long-term monitoring and a better understanding of environmental pressures in coastal ecosystems (especially soil erosion and run-off of toxic chemicals). It used a network of transects at the demonstration sites to monitor selected parameters and collect baseline information on ecosystem status.

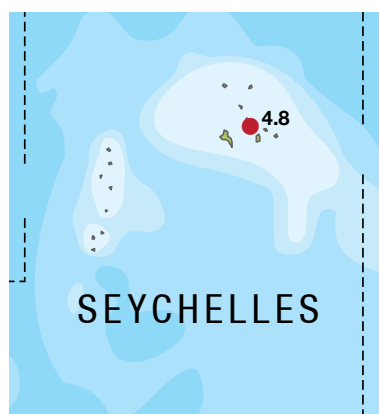
Community participation was built into monitoring to enhance local understanding of coastal ecosystems, project objectives, progress and results, and TRASS activities. Public education and awareness materials were produced to target not just residents of Anse Possession but also the entire population of Praslin and other central islands.

Target beneficiaries

A network of fishing and farming communities, schoolchildren and families, tourist businesses, and other individuals.

Outputs

- Survey and sampling of selected parameters at six stations along the Pasquière and Casimir Rivers.
- Description and sampling of selected parameters at four stations in the Pasquière and Casimir mangroves, and along three transects in the Baie of Pasquière lagoon.
- Organization of public events – “Being a biologist for a day” – for families.
- Production of TRASS website, including postings of educational materials, interactive activities such as quizzes, short videos to stimulate public interest and awareness, and project materials.
- Production of a documentary, radio programmes and media articles on the impacts of unsustainable land management on the environment and livelihoods.



LOCATION

Anse Possession, Praslin, Seychelles

PRIORITY POWS

Reef to Ridge
Management Assessment & Monitoring
Sustainable Business Practices

DURATION

One year

MFF GRANT AMOUNT

US\$23,200

Objectives

This project had three objectives:

- ❶ to improve understanding within the targeted communities about sustainable management of local natural resources;
- ❷ to develop and demonstrate coastal monitoring as a tool for monitoring soil erosion across different ecozones; and
- ❸ to empower local communities to take part in coastal monitoring, management and conservation

Background

Through this project, the Terrestrial Restoration Action Society Seychelles (TRASS) sought to develop capacity for and raise awareness of coastal monitoring. Five sites at Anse Possession were monitored: the Casimir River (heavily affected by soil erosion), the Pasquière River (relatively unaffected), the Baie Pasquière's mangroves, and the lagoon in Curieuse Marine National Park. These sites were chosen to include both upstream (ridge) and downstream (lagoon) ecozones.

Accomplishments and challenges

The project helped to boost the capacity of TRASS, enabling it identify ways to address the problems identified through the baseline surveys. It also helped TRASS to build partnerships within the private sector, government and volunteers from the general public.

Both state and private international schools showed great interest in the field work, and are looking forward to the next family demonstration day. TRASS plans to continue holding family days as part of its conservation education and awareness programme, and is raising funds to sustain other aspects of the project.

Challenges

One challenge was the timing of the water quality test, especially for pH and conductivity. The test needs to be done within six hours of collecting samples, but the Public Utilities Corporation which does this only works during weekdays. So monitoring had to move to weekdays, meaning that TRASS could not engage the community (participation was planned for weekends because of people's work commitments). TRASS resolved this problem by holding family days at weekends.

Some of the unexpected difficulties experienced during the project turned out to be opportunities. Through them TRASS gained the trust of and built partnerships with several national authorities and private businesses (such as SAA, SBS, PUC and C'est La Vie bottled water). Follow-up actions under other grants continue to enhance collaboration with the private sector.

Contributions to cross-cutting themes

Communications

TRASS developed interactive education materials and information for its website (www.trass.org.sc). A press article titled

"Ridge to Reef - Where does all the soil go?" was also developed for the project launch. The project also produced information banners on the importance of rivers and soils.

Gender equality

The project sought to generate benefits for men and women, both young and old. Although fishing and farming are predominantly male occupations, the ultimate beneficiaries of those activities are families.

Climate change

The project produced information for assessing vulnerability and adaptation potential through baseline surveys and monitoring. It also stressed the need to: protect and restore ecosystems; reduce environmental pressures; promote and strengthen research and long-term monitoring of coastal ecosystems; and adapt action plans, management plans and policies to emerging and changing conditions. This approach will help to implement actions aimed at adapting to climate change.

Lessons learned

TRASS sought to engage the community by inviting at least four participants to each monitoring session to participate in data collection. It could only cater for small groups of people because of the precarious nature of some of the sites, especially on rivers. For safety reasons and to limit any impacts on vegetation, small groups are preferable.

Partners and their contribution

In-kind contributions were made by the Department of Environment and Seychelles National Park Authority, including the Curieuse Marine National Park. The Wildlife Club of Praslin Secondary School took part in activities and helped to disseminate information. Coco D'Or Hotel & Service Hotel Ltd provided co-financing and Aldo Saachi made an in-kind contribution.



Collecting a water sample, Pasqui re River, Praslin, Seychelles   TRASS

"The MFF project helped us to set baselines and prompted us to build links with other initiatives to take action through increased partnership, collaboration and co-financing opportunities. We are happy it worked out well for us, especially as we are now decentralizing donor-funded projects from the main island to other initiatives on Praslin!"

— VICTORIN LABOUDALLON
CHAIRPERSON, TRASS

CONTACT INFORMATION

Victorin Laboudallon
Elvina Henriette

Terrestrial Restoration Action Society
Seychelles (TRASS)
PO Box 4057, Praslin,
Seychelles

SGF project achievements

Thirty-eight SGF projects were implemented in Sri Lanka. Many focused on mangrove rehabilitation (POW 2) or small-scale livelihood improvements (POW 8). Typically, the projects sought to improve the health of coastal ecosystems to help traditional fishing communities, especially those living around lagoons, and to introduce alternative livelihood opportunities to enable households in these communities to diversify their incomes. In addition, these objectives were often supported by activities aimed at strengthening the involvement of local communities in coastal resources management (POW 6).

The methods and technologies introduced by the livelihood projects were straightforward and fitted well with local knowledge and customs. For example, a project in Maduganga estuary set up a community biogas unit to produce cooking fuel using organic household waste (Project 5.24). Also in Maduganga, fishermen were given solar-powered rechargeable electric lamps to replace their traditional kerosene lamps (Project 5.29).

Home gardening, including cultivation of *Aloe vera*, was developed successfully by several projects, with the result that the additional household income generated helped to reduce pressure on natural resources. Some home gardens included fuelwood trees, for example, while the introduction of *Aloe vera* resulted in a small decrease in fishing effort as households became less dependent on fishing (Project 5.31).

Besides combining mangrove planting with alternative livelihood opportunities, fishermen learned to value mangrove rehabilita-

tion once they learned that this could improve coastal fisheries in the longer term. In some cases, however, this required a lengthy consultation process (Project 5.1).

These and similar projects helped to mitigate the overexploitation of natural resources, especially in Sri Lanka's heavily populated lagoons. They also fostered long-term adoption and dissemination of good environmental practices. One project supported publication of an environmental magazine as its main output (Project 5.25).

Conclusions

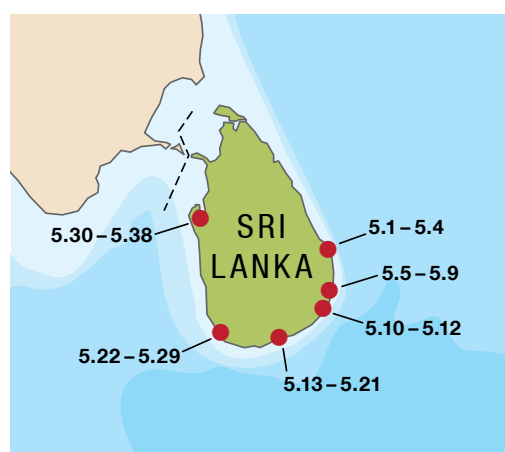
Underlying the success of the many SGF projects in Sri Lanka are the clear criteria set by the country's NCB for awarding grants (these specify six coastal target areas and five project selection criteria). Besides adopting the incidence of poverty as a key criterion, the potential for community participation was also specified to ensure sustainability and continuity of project outputs.

The small scale and simplicity of the livelihood projects in Sri Lanka were their main strengths. Some projects started with quite small numbers of beneficiaries, but have good potential for replication. People were readily able to see the benefits of simple measures such as providing water pumps and fuel-efficient stoves, or promoting home gardens and poultry and livestock farming.

In Sri Lanka and other countries, a number of projects clearly showed the importance of linking mangrove rehabilitation by local communities with tangible benefits that they can recognize and value.

SGF SRI LANKA PROJECTS

- 5.1 Replanting mangroves in Batticaloa lagoon
- 5.2 Coastal planting on Hadjar Beach
- 5.3 Coastal planting on Ethukkaal Beach
- 5.4 Training and supporting fisher families in Kattankudy to establish banana-based home gardens
- 5.5 Goat farming as an alternative income-generating activity for fisher families
- 5.6 Raising buffalo to enhance the income of widows and their families in Pottuvil (Phase 1)
- 5.7 Raising buffalo to enhance the income of widows and their families in Pottuvil (Phase 2)
- 5.8 Generating additional income for fisher families through poultry farming
- 5.9 Replanting mangroves in Pottuvil lagoon
- 5.10 Coastal green belt planting and livelihood improvement
- 5.11 Rehabilitation and reconstruction of Pottuvil mangrove nursery
- 5.12 Piloting seaweed farming as an alternative livelihood activity for coastal communities in Panama and Pottuvil
- 5.13 Cultivating bamboo as a wood substitute to protect mangroves and control erosion at Rekawa lagoon
- 5.14 Removing cattail from a village drainage canal
- 5.15 Training and supporting fisher families in Ussangoda to establish home gardens
- 5.16 Enhancing the incomes of fisher families through handicraft production
- 5.17 Developing ecotourism as an alternative to environmentally harmful activities
- 5.18 A participatory mangrove management programme
- 5.19 Building capacity of schoolchildren as a forerunner to sustainable mangrove ecosystem conservation initiatives (Phase 1)
- 5.20 Building capacity of schoolchildren as a forerunner to sustainable mangrove ecosystem conservation initiatives (Phase 2)
- 5.21 Restoring a village tank
- 5.22 Piloting sea bass cage culture as an alternative livelihood for the fishing communities of Maduganga estuary
- 5.23 Piloting red tilapia cage culture as an alternative livelihood in the Maduganga estuary
- 5.24 Establishing a community biogas plant
- 5.25 Publishing an environmental magazine, *Madupuwath*
- 5.26 Educating people about the threats to the Maduganga ecosystem
- 5.27 Enhancing schoolchildren's knowledge of mangrove ecosystems by training their teachers
- 5.28 Removing pond apple from parts of the Maduganga wetland
- 5.29 Improved community management of the Maduganga wetland
- 5.30 Empowering fisherwomen by generating additional income from the cultivation of Aloe vera (Phase 1)
- 5.31 Empowering fisherwomen by generating additional income from the cultivation of Aloe vera (Phase 2)
- 5.32 Sustainable livelihood development for low-income families in the Puttalam lagoon area
- 5.33 Replanting mangroves and introducing eco-friendly home gardening
- 5.34 Community-based mangrove planting at Kurakkanhena
- 5.35 Replanting mangroves in the Dutch Canal to enhance ecosystem productivity
- 5.36 Fuel-efficient stoves for coastal communities
- 5.37 Preserving Puttalam lagoon for future generations
- 5.38 Safeguarding mangroves through awareness programmes



General location of SGF Phase 1 projects in Sri Lanka

5.1 Replanting mangroves in Batticaloa lagoon



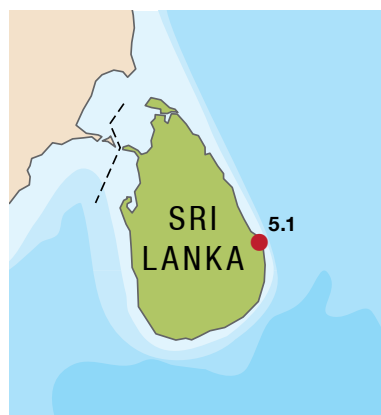
Rhizophora mucronata at Batticaloa lagoon, Sri Lanka © K. Ekaratne

Target beneficiaries

Fishermen living around Batticaloa lagoon.

Outputs

- ▶ Awareness raised on the importance of mangroves and their associated fauna and flora.
- ▶ Identification of six locations for planting mangroves.
- ▶ Propagation of 17,000 seedlings in a nursery.
- ▶ Establishment of 180 mangrove enclosures.
- ▶ Planting of 17,000 mangrove seedlings.



LOCATION

Batticaloa, Sri Lanka

PRIORITY POWS

Strategies for Management
Sustainable Livelihoods

DURATION

One year

MFF GRANT AMOUNT

US\$4,360

Objectives

The objectives of this project were twofold: to create awareness among local communities of the importance of Batticaloa lagoon and its flora and fauna to their daily lives; and to mobilise the communities to protect the lagoon environment effectively.

Background

Batticaloa lagoon is both an important ecological resource, providing habitats for many resident and migratory bird species, and an important economic resource, supporting the livelihoods of over 4,000 fishermen.

In recent years, however, the lagoon has seen heavy loss of the mangroves along its eastern shore. Development and the civil conflict have led to the clearing of 90% of these mangroves, reportedly causing a decline in fish and prawn sizes and catches. Local communities also complain of reduced firewood and timber supplies, and fewer reptiles and birds.

It is vital, therefore, to raise awareness of the importance of the remaining mangroves at Batticaloa and the fauna and flora that depend on them.

Accomplishments and challenges

Fishermen have come to appreciate the importance of mangroves through project activities. Project participants helped to collect seeds from different mangrove species and propagate them in a nursery. They then replanted the seedlings in the lagoon in the hope that the resulting vegetation cover would help to restore the natural fishery and eventually improve fishermen's returns.

Seedlings of *Rhizophora mucronata*, *Excoecaria agallocha*, *Sonneratia alba*, *Bruquiera gymnorhiza*, *Lumnitzera racemosa*, *Avicennia marina*, *Hibiscus* sp. and *Cerbera manghas* were planted by the project.

Four of the six planting sites have seen a considerable increase in mangrove tree cover; the grantee, MANDRU, is pursuing further work at the other two sites.

Challenges

The planting encountered several problems due to changing weather conditions, including fluctuating water quality, retardation of root development by heavy rain, difficulties in planting during the dry season, and a fungal

infection that affected every tree during the dry season. Further, young mangrove plants were browsed by stray cattle and goats, and some species did not survive replanting.

These problems and the work required initially made fishermen reluctant to support the project. It was only after repeated discussions that they came to realise the importance of mangroves and agreed to maintain the planting sites.

unadjusted to local conditions may not be as successful and may also have a negative impact on the environment. The progress of planting and growing should also be regularly monitored.

With enough time and awareness-raising efforts, local beneficiaries can be encouraged to look after planting sites. Schoolchildren have been identified as being most receptive to awareness-raising activities.

Lessons learned

The mangrove species used in planting should be sourced locally; other species

CONTACT INFORMATION

MANDRU (Institute for Alternative
Development and Regional Cooperation)

19 Saravana Road, Kallady,
Batticaloa, Sri Lanka

5.2 Coastal planting on Hadjjar Beach

Green belt on Hadjjar Beach, Kattankudy, Sri Lanka © R. Mahindapala



urgent need for protection and conservation.

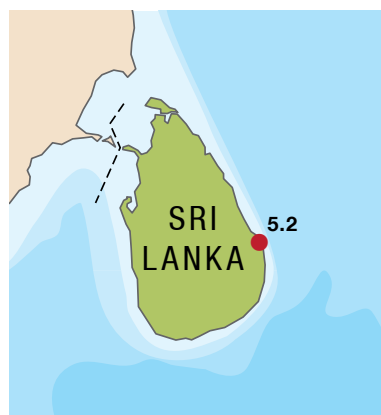
Coastal vegetation serves a protective function. It reduces the vulnerability of the coast and shoreline to erosion. To re-establish a protective cover of vegetation that will also enhance recreational values, Arifa Enterprises secured a small grant from MFF to undertake a pilot coastal replanting programme at Hadjjar beach.

Target beneficiaries

Fisher families living in Batticaloa and Kattankudy divisions, and members of the public who visit Hadjjar beach.

Outputs

- Gained approval for planting from Coast Conservation Department and Divisional Secretariat.
- Construction of a tube well.
- Planting of 150 *Casuarina* and *Barringtonia* trees.
- Installation of 150 eco-friendly protective covers for the trees.
- Protection and maintenance of the planted trees.



Objectives

The main idea behind this project was to protect a coastal area through reforestation which would also benefit the local community. The specific objectives were to protect the coast through reforestation, prevent soil erosion, increase rainfall and shade, enhance natural beauty and attract tourists.

Background

The vegetation of Hadjjar Beach in Kattankudy has twice been badly damaged by natural disasters, first by a cyclone in 1978 and then by the 2004 Indian Ocean tsunami. It appears that the cyclone damage was not effectively restored, nor was the beach properly maintained afterwards. The tsunami destroyed what vegetation was left, eroding the beach and causing extensive damage.

Before the tsunami, local people liked to spend their evenings and leisure time on the beach. After it they were forced to stay away, no longer able to use the beach to gain relief from the high temperatures and humidity in the area. The beach and the coast in this area are now actively deteriorating, creating an

Accomplishments and challenges

This project has taken the first steps towards restoring the coastal vegetation. In this first phase, 150 *Barringtonia* and *Casuarina* trees were planted, contributing to the regrowth of the coastal forest. Eco-friendly protective covers were constructed to protect the plants from harsh, salt-laden winds. These consist of wooden frames overlain with palmyrah leaves; the frames are made from wood discarded by a nearby timber yard. A tube well was also dug to supply water for the plants and for general use.

LOCATION

Kattankudy, Batticaloa, Sri Lanka

PRIORITY POWS

Strategies for Management
Community Resilience

DURATION

One year

MFF GRANT AMOUNT

US\$3,118

Challenges

Despite these accomplishments, the project faced several drawbacks. Some plants had to be replaced after dying in a drought, and the covers had to be repaired after being damaged by strong winds. The urban council also requested that the covers be removed and relocated. Lastly the project had to contend with a scarcity of palmyrah leaves and wood.

Contributions to cross-cutting themes

Climate change

The loss of vegetation in 1978 and 2004 caused the weather in Batticaloa to become drier and hotter than before. It is hoped that reforestation will help to increase local rainfall and decrease local temperatures.

Lessons learned

One year after planting, over 90% of the trees had survived and were growing well.

CONTACT INFORMATION

Arifa Enterprises

12, H.P. Lane, Kaburady Road,
Kattankudy, Batticaloa, Sri Lanka

Tel: +94 77 6231858

Together they form a green belt 500-m long and 4-m wide, established within a period of one year. These trees will, in the course of time, provide coastal protection as well as a shaded recreation area to be enjoyed by the community.

The success of this planting programme can be attributed to providing a well to support regular watering, making covers to protect the plants from the desiccating winds and, not least, involving the local community in maintaining the plantation. The project showed that replanting of coastal vegetation can be successfully achieved with tree cover reaching an appreciable level in a short space of time.

One lesson learned is that permission and cooperation from local authorities are needed to implement projects of this nature. Encouraged by its success, and especially the support and appreciation of the community, Arifa Enterprises gladly volunteered to look after the trees for another three years.



Sheltered coastal planting, Kattankudy, Sri Lanka
© R. Mahindapala

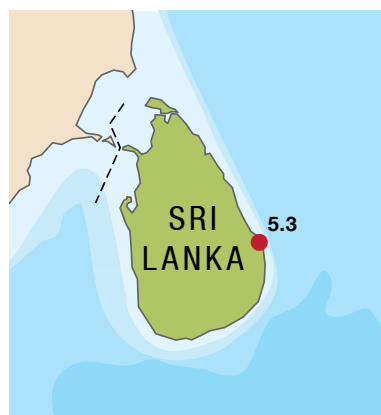
“Green belts, each 500 m by 4 m in extent, were established at Hadjar and Ethukkaal beaches in Kattankudy using Casuarina and Barringtonia plants. While these have contributed to improving the biodiversity of the area, the community now also enjoys the shade they provide.”

— MR ABDUL KAIYOOM
PROJECT COORDINATOR,
ARIFA ENTERPRISES

5.3 Coastal planting on Ethukkaal Beach



Mr Abdul Kalyoom, Arifa Enterprises, Sri Lanka © MFF Sri Lanka



LOCATION

Kattankudy, Batticaloa, Sri Lanka

PRIORITY POWS

Strategies for Management
Community Resilience

DURATION

One year

MFF GRANT AMOUNT

US\$3,913

Objectives

The main idea behind this project was to protect the coastal area through reforestation which would also benefit the local community. The specific objectives were to protect the coast through reforestation, prevent soil erosion, increase rainfall and shade, enhance natural beauty and attract tourists.

Background

The vegetation of Ethukkaal beach in Kattankudy has twice been badly damaged by natural disasters, first by a cyclone in 1978 and then by the 2004 Indian Ocean tsunami. It appears that the cyclone damage was not effectively restored, nor was the beach properly maintained afterwards. The tsunami destroyed any remaining vegetation, eroding the beach and causing extensive damage. Before the tsunami, local people liked to spend their evenings and leisure time on the beach. After it, they were forced to stay away, no longer able to use the beach to gain relief from the high temperatures and humidity in the area. The beach and the coast in this area are now actively deteriorating, creating an urgent need for protection and conservation.

Coastal vegetation serves a protective function. It reduces the vulnerability of the coast and shoreline to erosion. To re-establish a protective vegetation cover and enhance recreational values, Arifa Enterprises secured a small grant from MFF to undertake a pilot coastal replanting programme at Ethukkaal beach.

Target beneficiaries

Fisher families living in Batticaloa and Kattankudy divisions, and members of the public who visit Ethukkaal beach.

Outputs

- Planting of 134 *Casuarina* trees and 16 *Barringtonia* trees.
- Installation of eco-friendly protective covers for the trees.
- Construction of a tube well.

Accomplishments and challenges

This project has taken the first steps towards restoring the coastal vegetation. In this first phase, 16 *Barringtonia* trees and 134 *Casuarina* trees were planted, contributing to the regrowth of the coastal forest. Eco-friendly protective covers were constructed to protect the plants from harsh, salt-laden winds. These consist of wooden frames overlain with palmyrah leaves; the frames are made from wood discarded by a nearby timber yard. A tube well was also dug to supply water for the plants and for general use.

Challenges

Despite these accomplishments, there were some drawbacks. Some plants had to be replaced after dying in a drought, and the covers had to be repaired after being damaged by strong winds. The urban council also requested that the covers be removed and relocated. Lastly the project had to contend

with a scarcity of palmyrah leaves and wood for the protective tree covers.

Contributions to cross-cutting themes

Climate change

The loss of vegetation in 1978 and 2004 caused the weather in Batticaloa to become drier and hotter than before. It is hoped that reforestation will help to increase local rainfall and decrease local temperatures.

Lessons learned

One year after planting, over 90% of the trees had survived and were growing well. Together they form a green belt 500-m long and 4-m wide, established within a period of one year. These trees will, in the course of time, provide coastal protection as well as a

shaded recreation area to be enjoyed by the community.

The success of this planting programme can be attributed to providing a well to support regular watering, making covers to protect the plants from the desiccating winds and, not least, involving the local community in maintaining the plantation. The project showed that replanting of coastal vegetation can be successfully achieved with tree cover reaching an appreciable level in a short space of time.

One lesson learned is that permission and cooperation from local authorities are needed to implement projects of this nature. Encouraged by its success, and especially the support and appreciation of the community, Arifa Enterprises gladly volunteered to look after the trees for another three years.



Sheltered coastal planting, Kattankudy, Sri Lanka
© R. Mahindapala

CONTACT INFORMATION

Arifa Enterprises

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Kattankudy, Batticaloa, Sri Lanka

Tel: +94 77 6231858

“Green belts, each 500 m by 4 m in extent, were established at Hadjar and Ethukkaal beaches in Kattankudy using Casuarina and Barringtonia plants. While these have contributed to improving the biodiversity of the area, the community now also enjoys the shade they provide.”

— MR ABDUL KAIYOOM
PROJECT COORDINATOR,
ARIFA ENTERPRISES

5.4 Training and supporting fisher families in Kattankudy to establish banana-based home gardens



Homestead banana cultivation, Batticaloa, Sri Lanka © K. Ekaratne

much in demand in the area.

The project involved 20 selected fisher families living in the coastal zone. Each family was given 50 banana suckers, garden tools and enough compost and fertilizer for the first planting. Their progress was monitored regularly with the help of the local Agricultural Extension Office.

Target beneficiaries

Twenty fisher families living in the coastal area of Kattankudy.

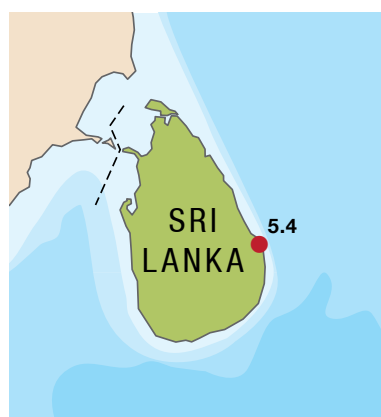
Outputs

- Delivery of an awareness programme.
- Provision of banana suckers to 20 fisher families.
- Planting and maintenance of 1,000 banana suckers.
- Planting of other fruit trees and vegetables.
- Introduction of natural fertiliser to protect garden soils.

Accomplishments and challenges

As a direct result of the project, 20 families in Kattankudy became skilled in establishing and maintaining banana plantations, and were able to enhance their income by selling garden produce. The cultivation of banana in home gardens in Kattankudy is now gaining in popularity. After seeing the success of project participants, neighbouring families have started plantations of their own to supplement their incomes.

One thousand clumps of banana were established in the 20 gardens, and are being tended by the beneficiaries. The participating families have interplanted banana with papaya, pumpkin and cucumber. Cultivation



LOCATION

Kattankudy, Batticaloa, Sri Lanka

PRIORITY POWS

Strategies for Management
Community Resilience

DURATION

Eight months

MFF GRANT AMOUNT

US\$3,952

Objectives

The main objectives of this project were to create a green living environment, to protect coastal vegetation, to encourage tree planting, and to improve the local people's living standards.

Background

Kattankudy, famous for its traditional Muslim sweets, is one of the most densely populated towns in Sri Lanka and was badly affected by the 2004 Indian Ocean tsunami. Its inhabitants are generally poor and depend on fishing for their livelihood. For extra income they harvest trees along the coast to sell as firewood, a practice which severely threatens the area's remaining coastal vegetation.

After much discussion with local people, the idea arose of creating home gardens as an alternative source of income to reduce pressure on and protect the coastal environment. The Organization for Protecting and Ensuring Democracy (OPED), an NGO based in Kattankudy, secured a small grant from MFF to implement a home garden programme with banana as the main crop, a fruit

is likely to be sustained as a large number of banana suckers is being produced.

The beneficiaries have all benefited economically from the project, deriving extra income from selling banana leaves and the small food crops grown among the banana trees. The families sell banana suckers as planting material, and sell banana leaves to local restaurants to use as plates and to wrap food. Meals are increasingly packed in banana leaves rather than paper, and banana flowers are also used in cooking to add flavour.

After home composting, any surplus dried banana leaves are sold to a nearby composting yard.

Challenges

The main challenge faced by the project was unexpectedly heavy rain, which caused water to pool and stagnate around the base of the banana plants.

CONTACT INFORMATION

Organization for Protecting and
Ensuring Democracy (OPED)

40 Shareef Proctor Lane,
Kattankudy – 02,
Sri Lanka

Contributions to cross-cutting themes

Gender equality

Women are actively involved in tending home gardens, providing an alternative source of income for fisher families during the storm season when fishing is not possible.

Lessons learned

Training and awareness programmes are the best ways to achieve project goals, as they motivate people to seek ways of supplementing their income. The success of the project can be attributed to the awareness workshop it organised, as well as a shared recognition of the need to protect the coastal environment and alleviate poverty by developing alternative livelihoods.

The active involvement of the local Agricultural Extension Officer, divisional secretariat and urban council in supporting beneficiaries was also key to the project's success.

5.5 Goat farming as an alternative income-generating activity for fisher families

Goat farming and community, Sri Lanka © R. Mahindapala



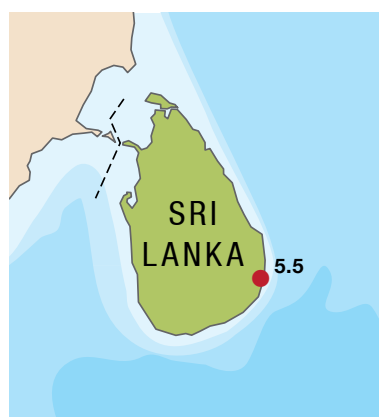
area for goat production and livestock rearing projects are gradually expanding.

Target beneficiaries

Tsunami-affected residents of Pottuvil, in particular 75 families, some headed by widows.

Outputs

- Land clearing and preparation of selected sites for the goat farm.
- Construction of fencing around the farm.
- Construction of a farm office, a shelter for goats, and a well.
- Training of eight widows to manage day-to-day activities at the farm.
- An increase in the original herd of 28 goats (certified by the local state veterinarian) to 43 animals within six months.



LOCATION

Pottuvil, Sri Lanka

PRIORITY POWS

Sustainable Livelihoods

DURATION

One year

MFF GRANT AMOUNT

US\$4,386

Objectives

This project aimed to build capacity and promote self-reliance among poor farmers and widows through improved income and social status.

Background

This small grant project set out to improve the socio-economic conditions of the war-affected and tsunami-affected population in Pottuvil, including families headed by widows, by supporting goat rearing and the development of a profitable and sustainable goat-farming business.

Goat farming is an increasingly important livelihood activity in the Sarvadayapuram area of Pottuvil, providing an environmentally friendly and sustainable source of income for poor farmers. The resources available in the

Accomplishments and challenges

Apart from some difficulties encountered during construction of the well (limited groundwater and a rocky substrate), the small grant project performed well. The community participated in operating a well-managed and profitable goat farm. Eight widows were given access to a part-time occupation, allowing each women to earn an average monthly income of LKR 2,000 (US\$17). The government contributed financial support to continue the project, and the local social development society organises monthly meetings to monitor the farm's progress.

Contributions to cross-cutting themes

Gender equality

This project targeted both men and women to develop capacity and increasing income.

Lessons learned

Goat farming turned out to be a profitable alternative livelihood for the community.

CONTACT INFORMATION

Al-Ameen Sammothy Society

Arugambay, Sarvodayapuram,
Pottuvil – 05,
Sri Lanka

Tel: +94 77 4061011



Goat farm, Sri Lanka © K. Ekaratne

5.6 Raising buffalo to enhance the income of widows and their families in Pottuvil (Phase 1)

Buffaloes managed by widows, Pottuvil, Sri Lanka © R. Mahindapala



ing standards of widows and families headed by women. In 2007, LDDFA received 30 buffaloes from GTZ (German Technical Cooperation), and in 2008 another ten from the UNDP Small Grants Programme, for widows in Pottuvil to tend. LDDFA secured a small grant from MFF to buy eight more animals and help another eight widows. Through this grant, LDDFA aimed to raise the living standards of these women by giving them a productive asset which they could use to earn extra income.

Target beneficiaries

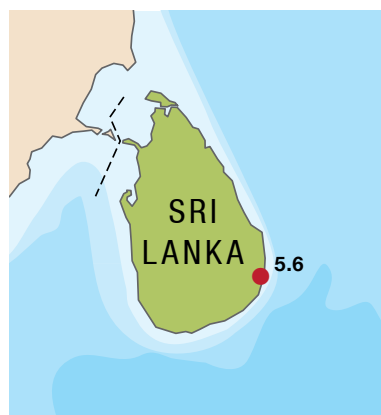
Families headed by women, in particular eight selected widows, in the Pottuvil area.

Outputs

- Identification of beneficiaries with assistance from the Pottuvil Divisional Secretary.
- Training of beneficiaries in buffalo rearing, milking and marketing of dairy products.
- Construction of a shelter and protective fence around the buffalo farm.
- Purchase of eight buffaloes, with the herd increased to 23 animals by the end of the project.
- Active participation by local government through periodic check-ups by the local state veterinarian.

Accomplishments and challenges

The project established a well-managed and profitable buffalo breeding unit. Widows were trained in buffalo farming and became actively engaged in farming activities. They gained skills and confidence in marketing dairy products and managed to generate extra income for their families. Eight widows were introduced to a part-time income-



LOCATION

Pottuvil, Sri Lanka

PRIORITY POWS

Sustainable Livelihoods

DURATION

Six months

MFF GRANT AMOUNT

US\$4,374

Objectives

The objective of this project was to raise the living standards of families headed by widows and other women by providing them with buffaloes for milking (dairy) purposes.

Background

Most of Pottuvil's mainly Muslim population depends on fishing, livestock rearing and small business enterprises for its livelihood. Pottuvil was affected by the long civil unrest in Sri Lanka, and the 2004 Indian Ocean tsunami killed many local men fishing at sea. These events left large numbers of women, mostly widows, as the heads of their families.

The poverty of these families and their communities, especially in the coastal areas, forces them to depend heavily on the surrounding coastal vegetation for fuelwood and other necessities. To address poverty and reduce the pressure on coastal resources, this project aimed to empower widows and female heads of families by establishing a buffalo farming enterprise.

The Livestock Development Dairy Farmer Association (LDDFA) of Pottuvil was established in 2003 with the goal of raising the liv-

generating occupation, and as a result each earned an additional monthly income of LKR 1,000 (US\$9).

The project managed to put in place a satisfactory arrangement to market buffalo milk. The monthly milk production, an average of 500 litres, fetched an average income of LKR 17,000 (US\$150). A litre of milk fetched an average price of LKR 34.22 (less than one US dollar).

CONTACT INFORMATION

Livestock Development Dairy Farmer Association (LDDFA)

Al-Kalam Vidyalaya,
Pottuvil,
Sri Lanka

Tel: +94 77 5382395

Contributions to cross-cutting themes

Gender equality

This project was targeted at women, giving them a chance to earn additional income.

Lessons learned

Training courses provide an opportunity to raise women's confidence in carrying out income-generating projects.

5.7 Raising buffalo to enhance the income of widows and their families in Pottuvil (Phase 2)

Buffalo milk processing facility, Pottuvil, Sri Lanka © R. Mahindapala



Outputs

- Similar outputs to the Phase 1 buffalo farm project.
- The purchase of a further eight buffaloes, together with calving in the existing herd, increased the total number of animals to 23 by the end of the project.

Accomplishments and challenges

The grant for Phase 2 contributed to a well-managed and profitable buffalo farm. Widows continued their active engagement in farming activities. The project generated and monitored regular progress reports and sales records of dairy products.

Contributions to cross-cutting themes

Gender equality

This project was targeted at women, giving them an opportunity to earn additional income.

Lessons learned

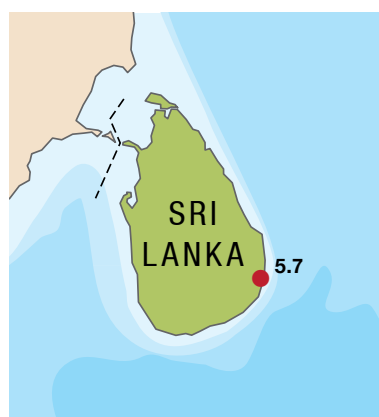
The positive experiences and outputs of the project augur well for its sustainability. Using project sales records and reports, LDDFA has been able to leverage funds from other sources to set up a milk processing facility. This will provide employment to local people in Pottuvil.

CONTACT INFORMATION

Livestock Development Dairy Farmer Association (LDDFA)

Al-Kalam Vidyalyaya,
Pottuvil,
Sri Lanka

Tel: +94 77 5382395



Objectives

The objective of this project was to raise the living standards of families headed by widows or other women by providing them with buffaloes for milking (dairy) purposes.

Background

This project built on the first Livestock Development Dairy Farmer Association (LDDFA) buffalo farm project in Pottuvil. The Phase 2 grant from MFF allowed LDDFA to purchase eight more buffaloes. The project aimed to improve the living standards of its female beneficiaries by giving them a productive asset they can use to earn extra income.

Target beneficiaries

Families headed by women, in particular eight selected widows, in the Pottuvil area.

LOCATION

Pottuvil, Sri Lanka

PRIORITY POWS

Sustainable Livelihoods

DURATION

Six months

MFF GRANT AMOUNT

US\$5,146

5.8 Generating additional income for fisher families through poultry farming

Poultry farm, Arugam Bay, Sri Lanka © K. Ekaratne



Target beneficiaries

Twenty widows and their families in the Pottuvil coastal area.

Outputs

- Delivery of an awareness programme for project beneficiaries.
- Establishment of a poultry farm and purchase of chicks.
- Maintenance and monitoring of the growth and health of chicks.
- Chickens harvested, packed and marketed.

Accomplishments and challenges

The project established a broiler poultry farm which can house about 1,000 birds, and employed 20 widows in managing production. A total of 500 chickens were raised and sold over two production cycles, earning a net profit of US\$350 in the first cycle and US\$266 in the second. These profits were equally divided among the 20 project beneficiaries, giving each woman an average income of US\$18 per cycle. This additional income served to reduce coastal exploitation pressure from the beneficiaries and their families.

Challenges

Two challenges faced by the project were inflation, which raised the costs of production, and severe drought conditions.

Contributions to cross-cutting themes

Gender equality

The project aimed to give 20 widows employment and an alternative livelihood.

Lessons learned

It is important to keep the local authority (Divi-

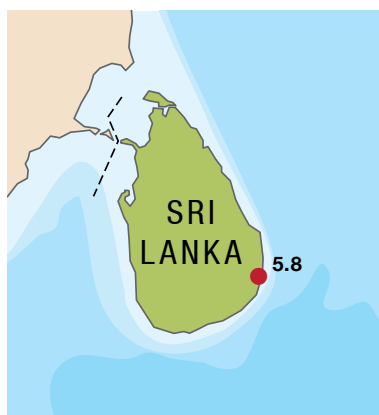
Objectives

The objective of this project was to conserve and protect the coastal ecosystem by providing alternative income-generating opportunities for local communities.

Background

Coastal communities in Pottuvil suffer from severe poverty and environmental degradation. They have few sources of income and lack the skills and education needed to improve their livelihoods. Poverty and environmental quality are closely linked: the need for firewood, shelter and other materials drives local people to cut mangroves indiscriminately.

This project sought to improve incomes and reduce pressure on the remaining mangroves in Pottuvil by promoting poultry farming as an alternative economic activity. The Arugam Bay Tourism Association (ABTA) used a small grant from MFF to establish a poultry farm on their land in Pottuvil to provide direct benefits to 20 widows and their families. The women shared the work of the farm, taking turns to carry out routine husbandry activities.



LOCATION

Pottuvil, Sri Lanka

PRIORITY POWS

Sustainable Livelihoods

DURATION

Nine months

MFF GRANT AMOUNT

US\$4,386

sional Secretariat, or DS) informed of project activities. In this case, monthly reports at a community coordinating committee meeting held at the DS office ensured the transparency of activities.

A well-managed and profitable broiler chicken farm can be established with limited resources, providing direct employment for

women farm workers and also creating jobs in maintenance and support services which further help the community.

ABTA has helped to protect the coastal environment by creating a new source of income for poor families who would otherwise depend almost entirely on natural ecosystems and their resources.

CONTACT INFORMATION

Arugam Bay Tourism Association (ABTA)

Arugambay,
Pottuvil – 18,
Sri Lanka

Tel: +94 77 4061011

5.9 Replanting mangroves in Pottuvil lagoon



Mangrove nursery, Pottuvil, Sri Lanka © K. Ekaratne

mangroves and the wider environment in Kottukal and surrounding areas.

Manthode is a village bordering Pottuvil lagoon. Its main livelihood is fishing, but villagers have noticed a decline in their catches which they attribute to the gradual loss of the mangroves. True Vision Rural Rehabilitation Organization, an NGO based in Pottuvil, sought to rehabilitate some of the degraded mangroves and thereby improve fish catches and incomes.

Target beneficiaries

The fishing community in the Kottukal area, in particular Manthode village.

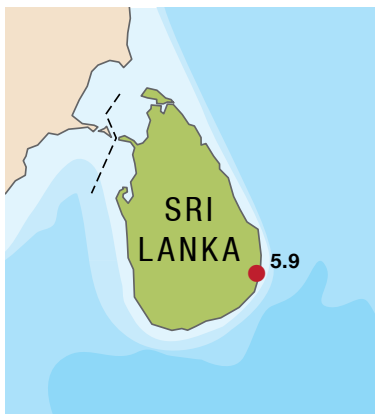
Outputs

- Increased awareness of the importance of mangroves.
- Organisation of two community mangrove conservation groups.
- Establishment of three community-operated nurseries.
- Propagation and replanting of 10,000 mangrove seedlings.

Accomplishments and challenges

The project highlighted the importance of the remaining mangroves to community livelihoods, and organised two community conservation groups. The lagoon fishermen of Manthode are now more aware of the role that mangroves play in their livelihood, motivating them to protect the remaining mangroves in their area.

Project beneficiaries increased their skills and knowledge in setting up and maintaining nurseries and planting mangroves. Three community-operated nurseries were established, raising 10,000 mangrove seedlings



LOCATION

Kottukal, Pottuvil, Sri Lanka

PRIORITY POWS

Strategies for Management
Community Resilience

DURATION

One year

MFF GRANT AMOUNT

US\$4,018

Objectives

This project had three objectives:

- 1 to restore the livelihoods of local people dependent on Pottuvil lagoon;
- 2 to support participatory mangrove rehabilitation and management; and
- 3 to raise awareness locally of the need to conserve the lagoon and mangrove ecosystems.

Background

Pottuvil is one of the most vibrant and productive coastal areas in Sri Lanka. The Kottukal area surrounding Pottuvil lagoon is a well-known tourist destination. Rich in biodiversity, it has still has some healthy mangrove stands. Although the local fishing community obtains a wide range of benefits from these mangroves, they are under constant pressure from over-exploitation and clearing for other land uses. The 2004 Indian Ocean tsunami also caused severe damage to the

(9,000 *Rhizophora* spp. and 1,000 *Avicennia* spp.). These seedlings were used to replant and rehabilitate an area of mangroves.

Challenges

One drawback of the project was a lack of community integration. Another major difficulty was poor weather – a severe drought which killed 3,000 seedlings in the nurseries and increased the salinity of Pottuvil lagoon was followed by heavy rains and flooding.

CONTACT INFORMATION

True Vision Rural Rehabilitation
Organization

30 Shariff Hakiya Road,
Addalaichenai, Sri Lanka

Tel: +94 71 4456412

Lessons learned

The community must be mobilised and integrated into all activities if projects of this type are to succeed. Community groups will be key to sustaining efforts to propagate mangrove seedlings.

At the outset of this type of project, potential planting sites should be assessed and tested before any action is taken. It is also important to establish nurseries in areas where fresh water is readily available.

“The project beneficiaries gained knowledge in establishing and maintaining a plant nursery, and planting and maintaining mangroves.”

— MR M. A. C. M. UVAIS
PROJECT COORDINATOR

5.10 Coastal green belt planting and livelihood improvement



Green belt at Panama, Sri Lanka © K. Ekaratne

family earnings, thereby empowering them economically.

Target beneficiaries

Residents of Panama, in particular selected women beneficiaries.

Outputs

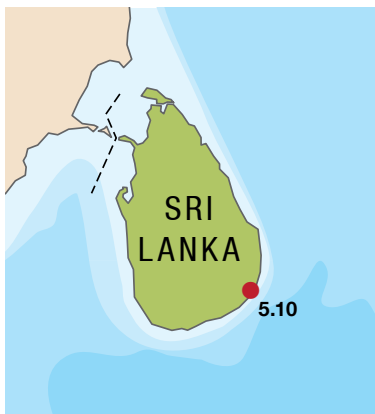
- ▶ Creation of a 1,200 m² coastal green belt plantation.
- ▶ Construction of a well for watering the plantation.
- ▶ Delivery of two awareness programmes on coastal conservation.
- ▶ Establishment of a coastal conservation society.
- ▶ Preparation of a coastal conservation activity plan with community participation.
- ▶ Provision of support to twelve women to start self-employment in seaweed farming.

Accomplishments and challenges

The rehabilitation of the coastal green belt prevented erosion by sea and wind, thus helping to reduce environmental degradation. The community increased its awareness of environmental issues, and twelve women empowered economically through job creation started earning a supplementary income to improve the living standards of their families.

Challenges

The project was hindered by a lack of support from government agencies, and by an initial



Objectives

This project had three objectives:

- ❶ to reforest the shoreline with the help of local communities;
- ❷ to protect the reforested shore with community participation; and
- ❸ to increase the incomes of women in the community.

Background

The 2004 Indian Ocean tsunami destroyed the coastal green belt of Panama, a village in the south-eastern coastal district of Ampara. It also damaged the local fishing economy – for families which traditionally depend on men to bring in an income from fishing this caused severe hardship and deprivation. This project sought to tackle both problems by introducing a programme of participatory coastal planting, and by giving women a means to earn extra income to supplement

LOCATION

Panama, Sri Lanka

PRIORITY POWS

Sustainable Livelihoods
Community Resilience

DURATION

One year

MFF GRANT AMOUNT

US\$4,254

lack of awareness of environmental issues in the community that was eventually overcome by awareness programmes.

Contributions to cross-cutting themes

Gender equality

In a major change to their economic and social status, twelve women are now successfully self-employed.

Lessons learned

The project worked best when responsibility for implementation was handed over to

the community. Also, instead of using concrete posts and barbed wire to fence off the planted areas (costly and prone to rusting), the project built fences with wooden poles and *Gliricidia* sticks. These are more cost-effective both to set up and to maintain.

Assigning two women to look after each block of plantation proved a successful method of ensuring plants were tended because of the healthy competition it generated.

Lastly seaweed farming has proved to have strong potential as an alternative source of family income.

CONTACT INFORMATION

National Ethnic Unity Foundation (NEUF)

Police Quarters Road,
Ampara, Sri Lanka

Tel: +94 63 2223425

5.11 Rehabilitation and reconstruction of Pottuvil mangrove nursery



Rehabilitation of Pottuvil nursery, Sri Lanka © K. Ekaratne

Outputs

- Propagation and planting of 6,500 seedling bags by the Hidayapuram Cooperative Society.
- Construction of a fence and gate at the nursery.
- Construction of a well.

Accomplishments and challenges

The project brought about an increased awareness and interest in environmental conservation and protection among the participating communities. It also increased cohesiveness and cooperation among community members. Further, it helped to increase local skills, knowledge and awareness about the technical requirements for collecting and propagating mangrove seeds, nursery management, and reforestation.

CEGA introduced an ecotourism programme through training of field guides; ecotours have proved an additional source of income for the community members belonging to the Hidayapuram Cooperative Society, increasing their economic power and independence.

Challenges

Poor weather, including drought, led to a high seedling mortality rate. Stray cattle also destroyed a number of seedlings even though they were protected by barbed wire fencing and coverings.

Contributions to cross-cutting themes

Gender equality

The ecotours industry has the potential to create employment for women in local communities.



LOCATION

Panama, Sri Lanka

PRIORITY POWS

Strategies for Management

DURATION

Eight months

MFF GRANT AMOUNT

US\$3,860

Objectives

This project aimed to encourage local community participation in environmental protection activities.

Background

The Community-Based Eco-guide Association (CEGA), a group of professional eco-guides based in Arugam Bay, Sri Lanka, aims to promote community-based tourism as a means of generating income and raising living standards. Community-based ecotourism has proved to be financially viable, providing valuable extra income for fishermen in the wake of the 2004 Indian Ocean tsunami. With a small grant from MFF, CEGA set out to rehabilitate and reconstruct Pottuvil mangrove nursery with the assistance of fishing communities in the Hidayapuram Cooperative Society.

Target beneficiaries

Members of Hidayapuram Cooperative, Arugam businesses and CEGA.

Lessons learned

Efforts to raise awareness among communities and improve stakeholder participation are needed throughout the project cycle.

Project designers also need to plan from the outset to convince the community that they are the owners of the project and the benefit will be theirs.

CONTACT INFORMATION

Community-Based Eco-guide
Association (CEGA)

Main Street, Arugam Bay,
Pottuvil,
Sri Lanka

Tel: +94 71 2058513

5.12 Piloting seaweed farming as an alternative livelihood activity for coastal communities in Panama and Pottuvil



Seaweed farming, Panama, Sri Lanka © K. Ekaratne

so the demand for cultivated seaweed is expected to rise. Before this project, however, Sri Lanka had no organised seaweed cultivation.

The Sewalanka Foundation, a leading Sri Lankan NGO, secured a small grant from MFF to start a pilot seaweed culture initiative. This cultivated *Eucheuma* in offshore cages at Panama and Ullei (in Pottuvil) on Sri Lanka's east coast. Sewalanka collaborated with two fisher cooperative societies in this project, the Abeysinghapura-Panama Fisheries Cooperative Society and the United Deep Sea Fisheries Cooperative Society in Pottuvil.

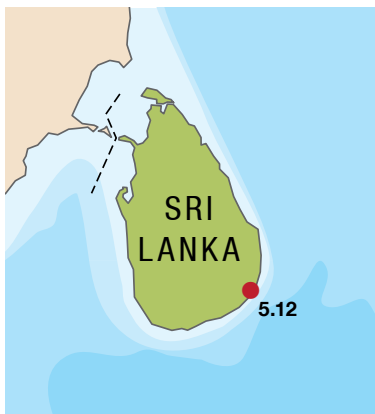
Several species of seaweed are commercially farmed in other Asian nations. In Sri Lanka, the Eastern and Southern provinces have good potential for seaweed cultivation, which also offers an alternative livelihood activity for poor coastal communities. The Sewalanka Foundation believes that women, in particular, could benefit socially and economically from the supplementary income provided by cultivating seaweed.

Target beneficiaries

Six fishermen, three from each fisher cooperative society, who showed a commitment to and interest in piloting seaweed culture.

Outputs

- ▶ Training of six fishermen in seaweed culture.
- ▶ Construction and offshore installation of 60 cages.
- ▶ Stocking of cages with seaweed cuttings.
- ▶ Completion of two culture cycles and harvesting of seaweed.
- ▶ Sun-drying and packaging of seaweed for the local market.



LOCATION

Panama, Sri Lanka

PRIORITY POWS

Sustainable Livelihoods

DURATION

Six months

MFF GRANT AMOUNT

US\$5,196

Objectives

The objectives of this project were:

- ❶ to raise the living standards of the coastal community;
- ❷ to promote sustainable use of marine and coastal resources; and
- ❸ to establish seaweed farming as an eco-friendly livelihood activity, especially for women, in the Pottuvil, Panama and Mawalla coastal area.

Background

Seaweed, apart from being a food, is an important source of colloids or gels such as agar, and medically important elements such as iodine. The seaweed *Eucheuma* sp. is a valuable source of carrageenan (polysaccharide gel), an important industrial compound used in stabilising and improving the quality of many food products. Many Sri Lankan confectionery manufacturers are interested in obtaining a local supply of carrageenan,

Accomplishments and challenges

As a result of this project, the participants enhanced their ability to diversify and supplement their livelihood. In two months, 100 g of cuttings grew into 1 kg (wet weight) of harvestable seaweed. About 50 kg to 70 kg (wet weight) of seaweed were harvested from a cage stocked with 4 kg of cuttings. (The dry weight of seaweed is about 10% to 12% of its wet weight.)

In Panama, the project secured a profitable contract with the National Aquatic Resources and Research Agency to supply mother plants to stock 100 cages in their Mannar project, under the Uthuru Wasanthaya Programme.

The project was supervised and monitored by the Sewalanka Foundation, which also provided relevant technology and assistance. Sewalanka is currently seeking partnerships to expand the project.

Challenges

The project encountered major difficulties, since there is no established market for seaweed in Sri Lanka, and finding a market for a small amount of dry seaweed is problematic as any buyers always want large quantities.

In the second culture cycle, the harvest from 56 cages had to be discarded after it was spoiled by heavy rain while drying.

CONTACT INFORMATION

Sewalanka Foundation

432A, 2nd Floor, Colombo Road,
Boralasgamuwa,
Sri Lanka

Tel: +94 47 5675614

Contributions to cross-cutting themes

Gender equality

Seaweed cultivation has the potential to provide jobs for women in coastal communities.

Lessons learned

The pilot initiative proved that the seaweed *Eucheuma* sp. can be successfully cultured in the seas off Panama and Ullei, and that seaweed farming offers an alternative livelihood and a supplementary income. Expanding the project should reduce the fishing pressure in Panama and Ullei.

An assessment is needed of the impacts of small-scale intensive aquaculture (cage culture) of the selected seaweed species as, in positive terms, a method for alleviating poverty and, in negative terms, an activity which may potentially damage the offshore environment.

Research is also needed to develop low-cost methods for seaweed farming, and to identify areas with no or small puffer and rabbit fish populations, as these fish browse seaweed crops, reducing their yield.

Seaweed is not widely consumed locally. As such, it is necessary to target the export market, which means large-scale production. An analysis of potential export markets should be the first step in planning and establishing an industry of this nature.



Cultured seaweed, Panama, Sri Lanka © K. Ekaratne

“This is one of the most successful projects I have ever been involved in, since I learnt a lot and gained extensive local knowledge, applying the lessons learnt to my current seaweed projects in Sri Lanka and finding success little by little.”

— MRS MAHEENI SINGAPPULI
NATIONAL FISHERIES COORDINATOR,
SEWALANKA FOUNDATION

5.13 Cultivating bamboo as a wood substitute to protect mangroves and control erosion at Rekawa lagoon



Bamboo nursery, Sri Lanka © K. Ekaratne

fishery, creating an urgent need to develop alternative sources of wood.

The NGO Ruhunu Development Consortium (RDC) obtained a small grant from MFF to introduce cultivation of the bamboo *Dendrocalamus hookeri* as a substitute for wood. Bamboo is widely used in the construction industry for scaffolding and for building house roofs and walls. The dense root structure of bamboo also gives it soil-binding qualities, making it a useful plant for controlling erosion on the banks of rivers, tanks and streams. RDC has planted bamboo both in home gardens (as a substitute for wood) and along the banks of watercourses and water bodies to combat erosion. Its foliage also provides valuable fodder for livestock.

Target beneficiaries

Landowners at Rekawa lagoon and community members who can benefit directly from selling bamboo wood and other products.

Outputs

- Delivery of awareness programmes for more than 90 families.
- Mobilisation of communities and other potential beneficiaries.
- Training given to selected community members in raising and planting bamboo.
- Establishment of three community-based nurseries to propagate bamboo.
- Propagation of 4,500 bamboo plantlets.
- Planting out of bamboo in selected sites.
- Monitoring and maintenance of planted bamboo stands.
- Development of lessons-learned materials and case studies for dissemination.



LOCATION

Rekawa, Ussangoda and Kalametiya (RUK) area, Sri Lanka

PRIORITY POWS

Strategies for Management
Community Resilience

DURATION

One year

MFF GRANT AMOUNT

US\$4,060

Objectives

This project had four main objectives:

- ❶ to introduce bamboo planting;
- ❷ to create an alternative source of wood for local communities;
- ❸ to prevent mangrove exploitation; and
- ❹ to develop supplementary sources of income.

Background

Rekawa lagoon, covering 250 hectares, is a highly productive ecosystem which supports the livelihood of a large fishing community. As a result of constant harvesting of wood for construction, pole-making and fuel, the mangroves and scrub forest surrounding the lagoon have declined steadily in area and quality. The shores of the lagoon have also been degraded by wood extraction, and in many places this has led to the lagoon silting up. Silting has had a direct and negative impact on the productivity of the lagoon

Accomplishments and challenges

The community has developed an interest in bamboo planting as an alternative source of income. Demand for bamboo seedlings has increased and all three community-operated nurseries are working to meet this demand. Project participants also planted 4,500 bamboo plants on 15 hectares of river banks, tanks and lagoon banks, as well as home gardens bordering water canals and public places such as schools and temples.

Challenges

The project encountered several obstacles with the bamboos selected and their growth. The proposed bamboo species, Yoda Una (*Dendrocalamus giganteus*) and Yellow Una (*Bambusa vulgaris*), were unavailable at the start of the project. As a result of inflation, prices of bamboo seedlings rose by 50% in the period between planning the project and implementing it. Some of the shoots that were brought from Kotmale also died. Lastly the 2009 rains did not arrive until mid-November, causing a delay in replanting and retarding growth rates.

Contributions to cross-cutting themes

Gender equality

The project benefitted both men and women, as everyone could engage in home garden-

ing of bamboo and contribute to improving the environment of the lagoon.

Lessons learned

The communities have taken to cultivating bamboo with great enthusiasm, which augurs well for the sustainability of project outputs. As the bamboo grows, it will help to stabilise and protect riverbanks, lakes and lagoon banks, and it will help to reduce the pressure on mangroves.

The community needs to appreciate that, with its help and understanding, good results can be achieved in protecting the environment. Success will be ensured if: a) an increasing number of community members grow bamboo in their home gardens or on empty land; and b) bamboo becomes a sustainable source of income for the community.

Bamboo vegetation will prevent soil erosion, act as a wind barrier, reduce the adverse effects of stormy weather conditions, prevent siltation of the lagoon and improve water storage capacity. In time, bamboo plantations will also enhance the natural beauty of the lagoon environment and provide an alternative livelihood.

In the post-project period, RDC has continued to provide technical support and monitor bamboo planting. A case study of the project has been prepared and will be useful to those wishing to replicate the project elsewhere.

CONTACT INFORMATION

Ruhunu Development Consortium (RDC)

79 Tissa Road, Tangalle,
Sri Lanka

Tel: +94 72 8231691

5.14 Removing cattail from a village drainage canal



Cattail removal, Sri Lanka © K. Ekaratne

recent times, the lagoon end of this canal has been blocked by fast-spreading cattail growth, impeding the drainage of about 10 hectares of rice fields belonging to 25 farmers. This has made the fields uncultivable and also affected the hydrology of Lunama lagoon. With a small grant from MFF, the Youth Enterprise Information Centre, a local NGO, undertook the clearing of the cattail with the affected farmers.

This project also aimed to conserve the ecosystem of the Lunama lagoon and help the surrounding community to supplement its income. It sought to improve the income of the 25 paddy farmers living near the lagoon by removing the cattail from the outlet canal. It also sought to encourage 22 vegetable farmers from Palugaswewa Farm to follow environmentally friendly practices, and to raise awareness of sustainable production practices among the 47 target farmers and 28 lagoon fishermen.

Target beneficiaries

Communities living in the Lunama area.

Outputs

- ▶ A 25% increase in the incomes of 25 rice farmers active in both the Yala (May–August) and Maha (September–March) seasons.
- ▶ Delivery of three awareness programmes for 28 lagoon fishermen and three programmes for 47 farmers.
- ▶ Removal of cattail from a 0.4 hectare area.
- ▶ The erection of fences around an 8.9 hectare block of Palugaswewa Farm and another farm of 16.2 hectares.
- ▶ Cultivation of at least five vegetable varieties by 22 farmers in both the Yala and Maha seasons.



Objectives

This project had three main objectives:

- 1 to increase the income of lagoon communities in an environmentally friendly fashion;
- 2 to raise the standard of living in those communities; and
- 3 to protect the Lunama lagoon ecosystem.

Background

The aquatic reed *Typha angustifolia*, or cattail, grows on lake margins and in marshes, often in dense colonies, and is considered a weed when it invades managed wetlands. The village of Lunama lies in the district of Hambantota on Sri Lanka's south-east coast. The main livelihood of villagers living close to the coast is fishing, whereas those living inland practise agriculture. The majority of farmers grow rice; others grow vegetables. An irrigation canal supplies water to the rice fields, and any excess water drains into nearby Lunama lagoon through an outlet canal. In

LOCATION

Rekawa, Ussangoda and Kalametiya (RUK) area, Sri Lanka

PRIORITY POWS

Strategies for Management
Civil Society Engagement
Sustainable Livelihoods

DURATION

Nine months

MFF GRANT AMOUNT

US\$4,386

Accomplishments and challenges

The original project plan was to remove cattail from a 2,500 m² area (i.e. a 500-m length of the 5-m wide outlet canal extending upstream from the lagoon). By the end of the project, however, 3,750 m² of the canal had been cleared of the invasive species. The farmers cleared the canal by hand instead of using machinery as budgeted in the project proposal. Contributing their labour allowed them to increase the cleared area by 1,250 m², 50% more than planned.

This effort has restored the water flow in the canal, improving the hydrological balance of Lunama lagoon.

The awareness programmes were successful in teaching the community sustainable production practices. The 25 rice farmers active during the Yala and Maha seasons saw their income rise by a quarter, and the 22 targeted vegetable farmers adopted at least five different varieties of vegetables for growing throughout the year.

Challenges

A severe drought limited the scale of planting.

Lessons learned

Giving local communities the responsibility to make decisions and respecting those decisions helps to achieve set goals.

CONTACT INFORMATION

Youth Enterprise Information Centre

Malpeththawa, Ambalantota,
Sri Lanka

Tel: +94 47 2223658

5.15 Training and supporting fisher families in Ussangoda to establish home gardens



Bitter melon home garden, Sri Lanka © K. Ekaratne

alternative livelihood activities, specifically home gardening of pulses and vegetables such as ladies' finger, millet, green gram, chilli, onion and cowpea.

Target beneficiaries

Forty fisher families in the RUK area.

Outputs

- Delivery of awareness programmes on home gardening, gender equality and financial management.
- Provision of vegetable seed and fruit plants.
- Establishment of 40 home gardens.
- Construction of protective cages for plants in home gardens.
- Cultivation of vegetables, millet, pulses and fruits.
- Cleaning of a 2-km stretch of beach.

Accomplishments and challenges

The project created 40 home gardens to provide extra income for poor fisher families. Through awareness programmes and other activities, the beneficiaries' awareness of agricultural practices, financial management and gender equality was enhanced.

Forty fisher families were introduced to agriculture, which was a new experience for them but has served to raise household incomes and awareness of key local development issues.

Women in the fisher families were trained and assisted in planting their home gardens with various crops. The beneficiary families gained a regular supply of fresh vegetables, fruits and pulses, and were able to sell their surplus produce at the weekly village fair, bringing in extra income.



LOCATION

Rekawa, Ussangoda and Kalametiya (RUK) area, Sri Lanka

PRIORITY POWS

Strategies for Management
Civil Society Engagement
Sustainable Livelihoods

DURATION

Ten months

MFF GRANT AMOUNT

US\$3,240

Objectives

This project had five objectives:

- ❶ to enhance the economic status of the community;
- ❷ to promote gender equality;
- ❸ to improve knowledge of financial management;
- ❹ to protect and sustainably manage the coastal ecosystem; and
- ❺ to provide an alternative source of income.

Background

Although surrounded by rich environmental resources, fishing communities in the RUK area lack economic stability, gender equality and appropriate knowledge for development. The Meth Sith Development Organisation sought to address all three deficiencies by conducting awareness programmes on nature conservation, financial management and gender equality. It also aimed to promote

Challenges

The main challenge was a severe drought that hindered growth of the home gardens.

Contributions to cross-cutting themes

Gender equality

This project sought to promote and improve

gender equality amongst its beneficiary families, focusing on women as the managers of home gardens.

Lessons learned

To maintain transparency, it is important to keep the local authority well-informed of ongoing village activities.

“The project gave the beneficiaries food security and a pleasant environment.”

— MRS DHANESHWARI DAHANAYAKE,
PROJECT MANAGER

CONTACT INFORMATION

Meth Sith Development Organization

180/3, Deewarawaraya para,
Nonagama, Lunama,
Sri Lanka

Tel: +94 71 6024847

5.16 Enhancing the incomes of fisher families through handicraft production

Women beneficiaries of handicraft production © R. Mahindapala



whose inhabitants harvest the mangrove trees and other plants for firewood and timber poles. As a result, the populations of *Rhizophora mucronata* and *Bruguiera gym-norrhiza* trees in these forests are declining. This project sought to reverse this trend by educating villagers about the importance of the mangroves, and by empowering women economically through income-generating alternatives to fishing. To test one alternative, Wanasarana Thurulatha Volunteer Society, a CBO from Matara, began a training programme in handicraft production using locally abundant *Pandanus kaida* leaves.

Target beneficiaries

Fifty women from five villages.

Outputs

- Delivery by a qualified instructor of five training programmes on processing *Pandanus* leaves, dyeing techniques, bag design, bag making, and marketing techniques.
- Provision for each trainee of a monthly supply of *Pandanus* leaves, dye, cloth, thread, cardboard and gum for the first nine months of their venture.
- Planting of 6,000 *P. kaida* plants in selected areas of Medilla beach in Netolpitiya village.

Accomplishments and challenges

As a result of the project, 50 women were gainfully self-employed on a part-time basis in producing handicrafts. The women produced a range of items, including mats, satchels, vegetable and fruit bags, ladies' handbags, clutch bags and coin purses. The project also introduced weaving of reed bags. Production time varied for each item, ranging from three to seven days.

Each women earned between US\$25



LOCATION

Rekawa, Ussangoda and Kalametiya (RUK) area, Sri Lanka

PRIORITY POWS

Sustainable Livelihoods
Sustainable Business Practices

DURATION

One year

MFF GRANT AMOUNT

US\$4,342

Objectives

This project had three main objectives:

- ❶ to enhance the knowledge of the community about mangrove protection and management;
- ❷ to bring timber cutting in Medilla lagoon under control; and
- ❸ to improve the livelihoods of 50 women living close to the lagoon.

Background

Danketiya, Palathuduwa and Netolpitiya are three coastal villages in south-east Sri Lanka that were hit by the 2004 Indian Ocean tsunami. Thanks to the mangroves and other coastal vegetation that protect the area, the tsunami did not cause severe damage, though it did affect the local fishing industry and fishing incomes. The continued protection and management of these forests are vital, but local authorities apparently have done little to ensure this happens.

The threat to the mangroves stems from the villages situated close to Medilla lagoon,

and US\$45 from selling bags, increasing the average income of their households by around 60%. The women were able to earn this income while still carrying out their household responsibilities, as they could operate from home and choose their hours of work themselves.

The *Pandanus* planted on Medilla beach as a source of leaves for producing handicrafts grew well and will contribute to coastal protection.

Challenges

One challenge was that the models and designs of bags change rapidly along with fashion trends, and it was sometimes difficult for the women to keep pace with these changes. Dry weather and browsing by stray cattle also affected the growth of the *Pandanus* plants.

CONTACT INFORMATION

Wanasarana Thurulatha Volunteer Society

Weeraketiya Road, Danketiya,
Tangalle, Sri Lanka

Tel: +94 47 2242628

Contributions to cross-cutting themes

Gender equality

Fifty women from five villages were empowered economically by the extra income they earned under this project.

Lessons learned

Community awareness is the key to success for projects of this nature. Also essential is to develop market linkages before implementing such projects, and to adopt a clear, realistic implementation schedule and stick to it.

Women in the community now have part-time jobs which do not depend on anyone else. They have organised small savings societies in which each member deposits 5% of her monthly earnings into a common bank account. This money is used to buy raw materials.



Handicrafts, Danketiya, Sri Lanka © K. Ekaratne

“Thanks to handicraft production, the income of the women in 50 beneficiary families living in the coastal areas of Rekawa and Medilla increased by about 60%. They are aware of the importance of coastal ecosystems in the area and no longer cut mangroves for fuelwood.”

— MR H. P. PIYATISSA
PROJECT MANAGER

5.17 Developing ecotourism as an alternative to environmentally harmful activities

Camping unit, RUK area, Sri Lanka © K. Ekaratne



as mesquite (*Prosopis juliflora*), prickly pear cactus (*Opuntia dillenii*) and lantana (*Lantana camara*), and fauna such as feral dogs and giant African land snails (*Achatina fulica*).

Ruk Diya Eco Holidays is a community-based organization supporting ecotourism activities in the RUK area. It is managed by a group of local youth who used to be involved in harmful activities such as poaching, collecting turtle eggs, and coral and inland shell mining. The organization, which runs a guest-house called Ruk Diya Eco Stop, secured a grant from MFF to expand its activities in the area surrounding Lunama lagoon.

Target beneficiaries

Villagers in the RUK area involved in environmentally damaging livelihood practices.

Outputs

- Establishment of two campsites with accommodation for 16 people.
- Establishment of a birdwatching centre, boat service facilities and educational facilities for schools and researchers.
- Production of a leaflet and posters to promote the campsites.

Accomplishments and challenges

The project identified local people involved in harmful livelihood practices (the target group) and successfully motivated them to join project activities. Programmes were conducted to raise their awareness of the environmental importance of the RUK area.

Two sets of well-appointed camping units were installed, each consisting of a two-storey wooden shelter housing four canvas tents, a toilet, camp beds and basic camping furniture. Eco Stop earns a monthly income of US\$260 from renting out the units and giving visitors home-cooked meals.



LOCATION

Rekawa, Ussangoda and Kalametiya (RUK) area, Sri Lanka

PRIORITY POWS

Sustainable Livelihoods
Sustainable Business Practices

DURATION

One year

MFF GRANT AMOUNT

US\$4,474

Objectives

The objective of this project was to encourage communities living in biodiversity-rich areas such as Lunama, Kalametiya and Ussangoda to protect their environment and improve their economic resilience.

Background

The area of Rekawa, Ussangoda and Kalametiya (RUK) lies on Sri Lanka's south-east coast in the district of Hambantota. The coastal ecosystems in this area are rich in biodiversity but face increasing pressure from human activities. Rekawa is a turtle sanctuary, while the Ussangoda plateau is a designated archaeological site. The interconnected Kalametiya and Lunama lagoons and their environs support a diverse range of bird species.

The major threats to these ecosystems include illegal fishing practices such as dynamiting, clearing of mangroves, unregulated livestock farming, turtle egg collection, wildlife poaching, coral mining and inland shell mining. The ecosystems are also threatened by the spread of invasive plants such

To service the camping facility, Ruk Diya Eco Stop has employed some members of the target group, diverting them from harmful practices.

The additional income coming to the community has added value to the RUK area. Community members have become more aware of their environment and more supportive of environmental conservation efforts. Protection of the mangroves has improved and increased numbers of students are visiting the area.

Challenges

The two main obstacles encountered were political interference and drought conditions.

CONTACT INFORMATION

Ruk Diya Community Based Organization

Ruk Diya Eco Stop, Kiula Lunama,
Ambalantota, Sri Lanka

Tel: +94 47 5672566

Contributions to cross-cutting themes

Communications

A leaflet and posters were produced to publicise the new campsites.

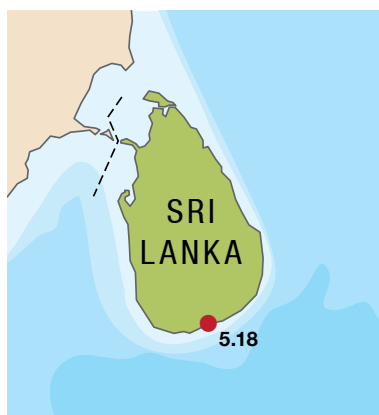
Lessons learned

By identifying the people harming the environment of the RUK area, making them more aware of its importance, and providing employment for some of them, the threats to this unique ecosystem are likely to diminish.

It is important to increase awareness of the importance of mangroves and the environment. Schoolchildren in particular need to be taught about the value of the environment.

5.18 A participatory mangrove management programme

Home gardens with plants to supply firewood around Rekawa, Sri Lanka © R. Mahindapala



LOCATION

Rekawa, Ussangoda and Kalametiya (RUK) area, Sri Lanka

PRIORITY POWS

Strategies for Management
Civil Society Engagement

DURATION

Ten months

MFF GRANT AMOUNT

US\$4,395

Objectives

The objective of this project was to increase community knowledge about mangroves and the alternatives to their exploitation, thereby encouraging future conservation of mangrove ecosystems.

Background

This project was implemented in the villages around Rekawa lagoon. Local people in this area are generally unaware of the environmental values of mangroves, and have severely degraded the lagoon's mangrove forests through firewood collection and other uncontrolled daily use. An urgent need exists to raise awareness of the environmental values of mangroves, in particular among the younger generation of villagers.

Target beneficiaries

Fifty families living beside Rekawa lagoon.

Outputs

- Establishment of a mangrove education centre with support from the Ruhuna Uni-

versity Agriculture Unit, housing a collection of mangrove tree species and related plants.

- Creation of 50 home gardens with 1,500 plants to supply firewood (species used: *Casuarina equisetifolia*, *Bambusa vulgaris*, *Sonneratia caseolaris* and *Terminalia catappa*).
- Delivery of three awareness programmes for schoolchildren.

Accomplishments and challenges

The project helped to change attitudes among Rekawa residents through awareness programmes on the importance of mangroves. The new home gardens are providing beneficiary families with firewood, thus reducing pressure on mangroves, and the foliage from plants in the home garden can also be used as organic manure to increase soil nitrogen levels.

The new mangrove centre now also provides a research base for those interested in studying and practising mangrove conservation.

Contributions to cross-cutting themes

Gender equality

This project targeted both men and women as beneficiaries.

Lessons learned

Awareness programs and education made it easier to achieve project outputs, as knowledge is the key to protection. Schoolchildren are the best medium for communicating conservation messages to the community.

Although the mangrove centre is being temporarily maintained by SEEDO (Social, Economic and Environmental Development

Organization), permanent staff are needed to look after the centre and its visitors. A short-term project such as this one cannot achieve long-term results on its own – further support is needed to ensure sustainability.

CONTACT INFORMATION

SEEDO Sri Lanka

130 Monaragala Road,
Badalkumbura,
Sri Lanka

Tel: +94 55 2250301

5.19 Building capacity of schoolchildren as a forerunner to sustainable mangrove ecosystem conservation initiatives (Phase 1)

Building the capacity of schoolchildren, Phase 1, Sri Lanka © Visura Development Foundation



sought to enhance awareness of mangrove conservation and its importance among children in the town of Ambalantota.

Target beneficiaries

Schoolchildren from Ambalantota Maha Vidyalaya school in the RUK area.

Outputs

- ▶ Delivery of awareness programmes for 50 students on identifying uses of mangroves by the community.
- ▶ Delivery of sessions to guide document preparation for 50 students.
- ▶ Delivery and facilitation of group presentation sessions on mangrove management for 50 students.



LOCATION

Rekawa, Ussangoda and Kalametiya (RUK) area, Sri Lanka

PRIORITY POWS

Civil Society Engagement

DURATION

Two months

MFF GRANT AMOUNT

US\$2,680

Objectives

This project had three main objectives:

- ❶ to enhance awareness among schoolchildren of mangroves, their uses, and sustainable consumption and conservation methods;
- ❷ to help GCE A-Level students conduct research projects on mangrove ecosystems; and
- ❸ to enhance students' capacity to promote environmental awareness by sponsoring activities on mangrove conservation.

Background

The RUK area is associated with rich mangroves, but increasingly these are being damaged by the activities of both visitors and residents. Since mangroves are an important part of the coastal ecosystem, it is vital to raise awareness among communities of their ecological roles and values. Recognizing that no one absorbs information or carries a message better than schoolchildren, this project

- ▶ Delivery of an awareness programme on mangrove species and the value of environmental management for 25 students.
- ▶ Delivery of awareness programmes on the uses of different mangrove species by rural communities for 25 students.
- ▶ Delivery of a programme on simple project proposal writing for 25 students.
- ▶ Establishment of a school environmental management unit with 50 students.
- ▶ Increased capacity within the school environmental management unit.
- ▶ Organization of an educational tour for 14 students.
- ▶ Organisation of art and essay competitions.
- ▶ Mounting of an exhibition for the project completion meeting.

Accomplishments and challenges

After conducting various awareness programmes and establishing a school environmental management unit, the target schoolchildren are now much more aware of the importance of mangroves.

Challenges

One disadvantage was that the project was a short one and coincided with the end-of-year school exams, so students could not give it their full attention. Further, the school selected for the project was in an underdeveloped area and suffered from a high level of student absenteeism.

Contributions to cross-cutting themes

Communications and gender equality

The students participated in art and essay

competitions, and mounted an exhibition for the project completion meeting. The project targeted all schoolchildren irrespective of whether they were boys or girls.

Lessons learned

Awareness can be raised in younger generations by stimulating schoolchildren's interest and passion for the environment through art, essay and public speaking competitions, and by encouraging them to discuss the importance of mangroves with their families and communities. The project successfully changed children's perceptions through awareness programmes highlighting the importance of conserving their local environment.

Awareness programmes need to be scheduled carefully to avoid conflicts with important dates in the school calendar, for example avoiding exams.

CONTACT INFORMATION

Visura Development Foundation

Weeraba Pirivena, Nupe,
Matara, Sri Lanka

Tel: +94 41 2230671

5.20 Building capacity of schoolchildren as a forerunner to sustainable mangrove ecosystem conservation initiatives (Phase 2)

Building the capacity of schoolchildren, Phase 2, Sri Lanka © Visura Development Foundation



ness promotion tools. Advanced students carried out research studies on mangrove ecosystems, and an Environmental Conservation Unit was formed to lead students in carrying out the environmental programme during the project period.

Target beneficiaries

Schoolchildren from Mawadala Baminiyanwila Jayanthi School in the RUK area.

Outputs

- Delivery of a series of awareness programmes on mangrove use and conservation.
- Delivery of guidance programmes on developing and implementing simple research projects on mangrove ecosystems.
- Formation of a School Environmental Conservation Unit.
- Organization of an environmental education study tour to increase children's exposure to the subject matter and create links to government authorities.

- Mounting of an exhibition for the project completion meeting.

Accomplishments and challenges

After conducting various awareness programmes, and establishing a school environmental management unit, the target schoolchildren are now much more aware of the importance of mangroves.

Challenges

These included the short duration of the project, and the fact that it coincided with the end-of-year school exams, which drew students' attention away from project activi-



LOCATION

Rekawa, Ussangoda and Kalametiya (RUK) area, Sri Lanka

PRIORITY POWS

Civil Society Engagement

DURATION

Six months

MFF GRANT AMOUNT

US\$3,311

Objectives

This project had three main objectives:

- 1 to enhance knowledge and understanding among schoolchildren of identifying mangrove species, the uses of mangrove products, and different methods of sustainable consumption and conservation of mangroves;
- 2 to help GCE A-level students conduct research projects on mangrove ecosystems; and
- 3 to enhance students' capacity to promote environmental awareness by sponsoring activities focusing on the conservation of mangrove ecosystems.

Background

Schoolchildren are said to be the main messengers of information to their household, so this project sought to raise awareness of mangrove conservation and its importance among children in schools. This was achieved at two levels using simple aware-

ties. Also, the school selected for the project was in an underdeveloped area and suffered from a high level of student absenteeism.

Contributions to cross-cutting themes

Gender equality

The project involved all schoolchildren in the target school irrespective of whether they were boys or girls.

CONTACT INFORMATION

Visura Development Foundation

Weeraba Pirivena, Nupe,
Matara, Sri Lanka

Tel: +94 41 2230671

Lessons learned

It is possible to change schoolchildren's attitudes through awareness programmes highlighting the importance of protecting their environment. Such programmes can encourage students to take more interest and play a greater role in environmental conservation initiatives. As a result of the project, the target schoolchildren have been able to learn about the value of a healthy natural environment.

5.21 Restoring a village tank



Palugaswewa tank, Sri Lanka © K. Ekaratne

Outputs

- Restoration of the tank according to relevant local authority guidelines.
- Diversion of a stream to supply the tank with water.
- Increased tank capacity (from 6 to 14 hectare-metres*).
- Enabling of 22 farm families to continue cultivation even during a drought.
- Increased income of farmers from adding a season of cultivation.

Accomplishments and challenges

The tank was cleared of vegetation with the help of the 22 farm families. It was mechanically dredged and its bund strengthened, increasing its capacity from 6 to 14 hectare-metres. A stream that drained rainwater from the forest into the sea was diverted into the restored tank by building an anicut (dam) across it. A supply canal was constructed to bring water from the tank to the farm.

The increased off-season water supply gave the farmers an additional season of cultivation, and allowed the 22 farm families to continue their cultivation during the dry season. The increase in income resulting from these improvements ranged from US\$25 to US\$175 per farm family.

Contributions to cross-cutting themes

Gender equality

Both men and women were involved in the project and benefited from it through the extra income from increased agricultural production.



LOCATION

Rekawa, Ussangoda and Kalametiya (RUK) area, Sri Lanka

PRIORITY POWS

Strategies for Management
Civil Society Engagement
Sustainable Livelihoods

DURATION

Two months

MFF GRANT AMOUNT

US\$3,650

Objectives

This project aimed to increase the water supply to Palugaswewa farmers by restoring the local tank (reservoir).

Background

Palugaswewa farm was established in the early 1980s to support 22 low-income fisher families under a national village reawakening scheme. Each family received a plot of 0.4 hectares for rainfed cultivation. The Palugaswewa tank, a reservoir lying next to the farm, offers a potential source of irrigation water for off-season cultivation, but has been unable to play this role because of low rainfall and its dilapidated, silted interior. The Youth Enterprise Information Centre, a local NGO, obtained a small grant from MFF to rehabilitate the tank and increase its water-holding capacity.

Target beneficiaries

Farming families of Palugaswewa.

* A hectare-metre is a measure of volume equivalent to 1 m × 1 ha = 10,000 m.

Lessons learned

Success can be gained through technical assistance and knowledge sharing. When working with local communities, it is important to give them responsibility to make their own decisions; respecting these decisions helps to achieve set goals.

CONTACT INFORMATION

Youth Enterprise Information Centre

Malpetthawa, Ambalantota,
Sri Lanka

Tel: +94 42 2223658

5.22 Piloting sea bass cage culture as an alternative livelihood for the fishing communities of Maduganga estuary

The harvest from fish cage culture, Maduganga, Sri Lanka © R. Mahindapala



high market price locally and internationally, grows quickly, and survives in most conditions, making it a good choice for rearing in the estuary. The cage culture system allows water to circulate freely, keeping operational costs low. The species is inexpensive to maintain and relatively easy to produce, and the eco-friendly nature of this activity makes it a good source of income for local communities.

Target beneficiaries

Four traditional fishermen from the community-based Ampe Mithuru Freshwater Fisheries Cooperative Society in Maduganga.

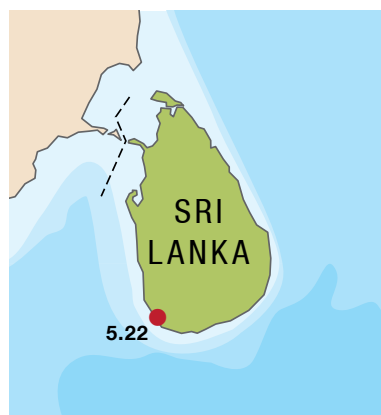
Outputs

- Establishment of pilot cage culture using floating nets.
- Transferral of technology for intensive culture of finfish to fishermen.
- Generation of economic growth and indirect employment.
- Reduced exploitation of local mangroves and wildlife.

Accomplishments and challenges

Through the project, beneficiaries were able to develop another source of employment and income besides sea fishing. The target fishermen learned how to rear sea bass and gained skills and knowledge in efficient fish management systems. The cage-reared sea bass reached a weight of 800 g in just four months thanks to good feeding practices.

The additional income from sea bass rearing has indirectly helped to reduce pressure on nearby mangroves. Fish farming is also contributing to alleviating local poverty sustainably since it has low operational and environmental costs.



LOCATION

Maduganga, Sri Lanka

PRIORITY POWS

Sustainable Livelihoods

DURATION

Nine months

MFF GRANT AMOUNT

US\$5,260

Objectives

This project had three objectives:

- 1 to raise the living standards of coastal communities in Maduganga;
- 2 to promote sustainable use of marine and coastal resources; and
- 3 to introduce sea bass cage culture.

Background

Sri Lanka possesses the resources and potential to develop a sustainable aquaculture industry in its coastal belts. These areas suffer from poverty and food shortages, so inland aquaculture could contribute to enhancing food security. It could also increase employment and provide additional income for local fishing communities. The Maduganga estuary, a brackish water system in Sri Lanka's wet zone lowlands, has great ecological importance. The water quality of the estuary makes it ideal for culturing *Lates calcarifer*, also known as the giant sea perch, sea bass or barramundi. This fish fetches a

Challenges

Some difficulties were encountered in selling cage-reared fish, including obtaining a good market price. There was no direct marketing system to sell the fish, so fishermen had to deal with middlemen who paid below-market prices. It was also difficult to find a buyer for the entire stock as fish wholesalers offered better prices; however, it was possible to get a good price for a partial harvest.

Lessons learned

It is essential to identify an appropriate mar-

ket and develop a strong marketing strategy before embarking on an activity of this nature. Also vital is appropriate technical support is vital. The Sewalanka Foundation committed itself to supervising and monitoring the project, and to providing support for book-keeping, fish farming techniques and related matters.

Neighbouring fishermen have followed the lead of the project and begun to set up fish cages of their own. This extension effect will help to increase economic development in the area.



Sea bass cage culture, Maduganga, Sri Lanka
© K. Ekaratne

CONTACT INFORMATION

Sewalanka Foundation

Bakmeegahawatttha,
Kahawannagama Road,
Thalpe, Sri Lanka

Tel: +94 91 2282674

“Young fishermen, who were totally dependent on the estuary resources for their survival and who were unhappy about their incomes, were initially recruited for the project. It is good to see them continuing fish farming even though the donor funding and other support have ended.”

— MRS MAHEENI SINGAPPULI
NATIONAL FISHERIES COORDINATOR,
SEWALANKA FOUNDATION

5.23 Piloting red tilapia cage culture as an alternative livelihood in the Maduganga estuary



Tourists feeding tilapia, Maduganga, Sri Lanka © K. Ekaratne

that is fast becoming widespread around the world.

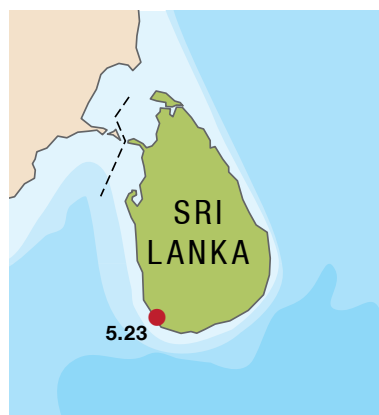
Red tilapia, as it is known in Sri Lanka, is a popular food fish which can be grown in saltwater ponds or sea cages with low production costs and minimal environmental impacts. Introducing red tilapia cage culture to coastal communities around the Maduganga estuary has the potential to raise living standards and create an eco-friendly alternative livelihood for poor fisher families.

Target beneficiaries

Four traditional fishermen from the community-based Ampe Mithuru Freshwater Fisheries Cooperative Society in Maduganga.

Outputs

- Construction of eight fish-rearing cages for red tilapia.
- Transferral of technology for intensive culture of finfish to fishermen.
- Training for fishermen in cage construction, feed preparation using local ingredients, and feed management.
- Generation of an alternative source of income for these fishermen, leading to enhanced economic growth and indirect employment.
- Reduced exploitation of local mangroves and wildlife.



LOCATION

Maduganga, Sri Lanka

PRIORITY POWS

Strategies for Management
Civil Society Engagement
Sustainable Livelihoods

DURATION

Six months

MFF GRANT AMOUNT

US\$4,321

Objectives

This project had four objectives:

- 1 to raise the living standard of the coastal community in Maduganga;
- 2 to improve the community's awareness of the environment;
- 3 to promote sustainable use of marine and coastal resources; and
- 4 to introduce red tilapia cage culture as a livelihood alternative.

Background

Hybrid tilapia (*Oreochromis* spp.) are the second most important farmed fish species in the world. They are widely distributed and successfully farmed in tropical, subtropical and temperate regions. Their fast growth, tolerance of low oxygen levels, resistance to disease, mass breeding potential and good market acceptance makes them an ideal food fish. Raising these fish in confined, controlled conditions is an aquaculture practice

Accomplishments and challenges

Project beneficiaries successfully established a cage rearing system for red tilapia, specifically genetically improved farmed tilapia (GIFT). The experience of the project indicates that cage rearing offers a viable alternative occupation to sea fishing. Project beneficiaries also gained skills and knowledge

in efficient fish management systems. Their success has created a noticeable extension effect, with neighbouring fishermen now constructing fish cages and rearing fish themselves.

The additional income from the sale of red tilapia has helped to reduce exploitation pressure on nearby mangroves and other coastal resources. Fish farming is also contributing to alleviating poverty sustainably, since it has low operational and environmental costs.

Challenges

One challenge faced by the project was the difficulty in finding a buyer for the entire harvested stock of tilapia.

CONTACT INFORMATION

Sewalanka Foundation

Bakmeegahawatttha,
Kahawannagama Road,
Thalpe, Sri Lanka

Tel: +94 91 2282674

Lessons learned

It is essential to identify an appropriate market and develop a strong marketing strategy before embarking on an activity of this nature. Social mobilisation is also necessary for stable and sustainable implementation of project activities.

The target beneficiaries have been happy with the success of their venture and have agreed to keep it running. They have produced a second harvest of red tilapia, and the Sewalanka Foundation has committed itself to supervising and monitoring their efforts, and to supporting them in book-keeping, fish farming technology and other relevant matters.

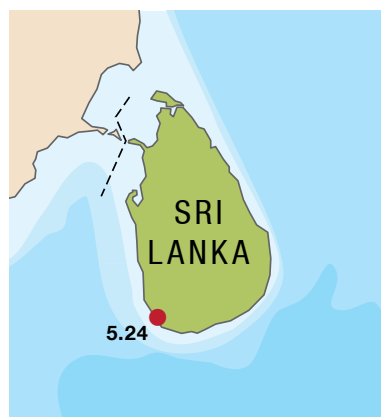
“The programme aimed to promote an attractive livelihood activity which is acceptable ecologically, socially and economically, and will protect natural resources in and around Maduganga estuary. It is good to see young fishermen continue fish farming even though the donor funding and other support have ended.”

— MRS MAHEENI SINGAPPULI
NATIONAL FISHERIES COORDINATOR,
SEWALANKA FOUNDATION

5.24 Establishing a community biogas plant



Biogas cook, Balapatiya, Sri Lanka © K. Ekaratne



LOCATION

Maduganga, Sri Lanka

PRIORITY POWS

Strategies for Management
Civil Society Engagement

DURATION

One year

MFF GRANT AMOUNT

US\$4,382

Objectives

This project had four main objectives:

- 1 to increase awareness of the value of mangrove ecosystems;
- 2 to demonstrate successful methods for restoring mangroves;
- 3 to prevent further destruction of mangroves; and
- 4 to provide alternative livelihoods.

Background

The Maduganga estuary is one of Sri Lanka's most important wetland sites and home to a diverse range of plant and animal species. This richness, however, is threatened by over-exploitation and pollution, creating an urgent need to educate local people about the threats to the wetland and instil an appreciation of its multiple values.

The communities living in the estuary generally depend on seasonal small-scale fishing and other minor sources of income. Many were severely affected by the 2004

Indian Ocean tsunami. Other than wood the local people have no sources of energy, so rely heavily on the estuary's mangroves for firewood. Alternative sources of energy and income that are both cost-effective and environmentally friendly are badly needed.

In the village of Mohottiwatta, the more affluent households use liquid petroleum gas for cooking, but others mostly use fuelwood. Mohottiwatta lacks an organized waste collection service, so villagers dump their kitchen waste into the estuary.

To reduce fuelwood extraction from mangroves and pollution of the estuary, the NGO Human & Environment Links Progressive Organization (HELP-O) constructed a small biogas plant on private property in the village to supply cooking gas to three nearby households. HELP-O also helped the community to develop alternative sources of income, with the goal of strengthening the environmental sustainability of coastal development and raising public awareness of local environmental concerns.

Target beneficiaries

Families living near the Maduganga estuary.

Outputs

- Installation of a 12 m³ biogas unit to produce cooking fuel using organic household wastes supplied daily.
- The supply of generated biogas to households.
- Enhanced awareness of local environmental concerns.
- Improved livelihoods through alternative forms of employment.
- Establishment of home garden programmes.
- Replanting of 0.2 hectares of mangroves.

- Collection and disposal of waste from the coastal area.

Accomplishments and challenges

Four families are now using biogas units to generate energy instead of cutting mangroves for firewood. The biogas plant received a much larger amount of kitchen waste than anticipated. Besides the waste from the direct beneficiaries (i.e. the householders provided with gas), other community members also brought their kitchen waste to the plant. A nearby Home for the Aged and a Boys' Home also supplied their kitchen wastes. The increased supply of waste enabled four households to be supplied with gas, one more than originally planned.

Through the project, villagers engaged in other activities to generate income for their families, including home gardening, coconut fibre production and tourism. Villagers took to home gardening, spurred by positive results from using liquid fertiliser produced by the biogas plant.

The project's awareness programmes helped to increase local people's knowledge about mangroves and their values. Families became more aware of the importance of the environment, and involved themselves in communal activities to improve it. More than 150 villagers cleared the waste from a one-kilometre stretch of shoreline, and an initiative was launched to protect the Madu River.

Challenges

The project managed to cut dumping of waste into the estuary, as both direct and indirect beneficiaries in Mohottiwatta now take their kitchen wastes to the biogas plant. Nevertheless it proved difficult to stop people using the shore as a waste dump.

Another obstacle was a negative view of biogas units, caused by a belief that they would warm people's homes and emit a putrid smell. Some people also had a negative opinion of organic fertiliser, but awareness programmes helped to overcome this.

Replanting mangroves was also a challenge as newly planted trees needed cover and shade to grow, but these were not easily found in the area.

Contributions to cross-cutting themes

Gender equality

The project was a collective effort involving both men and women as active participants. In communities such as Mohottiwatta, men are generally seen as the breadwinners and women as the housewives, but this project help to empower women economically. Women also played a part in income distribution, strengthening community involvement in this effort.

Lessons learned

As the experience in Mohottiwatta has shown, changing the attitudes of local people may be needed to achieve success in some communities. The reluctance of community members to venture into new activities, such as using biogas units, can be overcome by exposing them to their benefits through visits to communities which have successfully adopted such innovations.

The project was effective on three fronts. More and more families are using biogas units. Women have been empowered and are creating their own home gardens. Lastly the community has recognised the importance of mangroves and the estuary ecosystem, and has strengthened its efforts to protect the coast and its resources.

CONTACT INFORMATION

HELP-O (Human & Environment Links Progressive Organization)

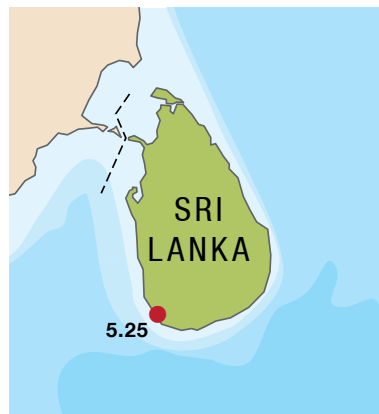
364/18A, Samagi Mawatha, Galle, Sri Lanka

Tel: +94 91 4380121

5.25 Publishing an environmental magazine, *Madupuwath*



Madupuwath magazine, Sri Lanka © K. Ekaratne



LOCATION

Maduganga, Sri Lanka

PRIORITY POWS

Civil Society Engagement

DURATION

One year

MFF GRANT AMOUNT

US\$4,386

Objectives

This project had two main objectives: to educate the community living around Maduganga estuary about its environmental values; and to educate schoolchildren in the local community.

Background

The Maduganga estuary and its islands, a complex coastal wetland ecosystem, was declared a Ramsar site in 2003. The 915 hectare estuary consists of 770 hectares of open water and 15 islands that collectively cover 145 hectares. It has several wetland vegetation types, including mangrove forest, mangrove scrub and bank scrub, with a total of 303 plant species in 95 families. Mangroves harbour the greatest number of plant species, closely followed by mangrove mixed swamps.

The threats to the Maduganga wetland are many, chiefly clearing of mangroves, dumping of waste, discharges of fuel from boats, discharges of agro-chemicals, the spread of invasive species, and erosion of

river banks. The need to inform local people of the dangers faced by this unique ecosystem, and so reduce the threats, was recognized by the Maduganga Development Foundation (MDF), a pioneering local NGO. With support from government, and later MFF, MDF started spreading the message through an environmental magazine.

Madupuwath is a monthly environmental magazine devoted to the Maduganga wetland. Published in the Sinhala language, the first four issues were printed in 2007 in black and white, with funds from the Coastal Resources Management Project administered by the Coast Conservation Department. MDF secured a small grant from MFF to produce 12 more issues of the magazine, which carries news items and articles on Maduganga area.

The aim of this project was to educate the community around Maduganga, and in particular to educate local schoolchildren and win their cooperation for protecting the remaining unspoilt mangroves in the estuary.

Target beneficiaries

The community living around the Maduganga wetland, and schoolchildren in particular.

Outputs

- Production and distribution of 12 issues of *Madupuwath*.
- Awareness of environmental issues raised in the community.

Accomplishments and challenges

Over the course of a year, the project published 12 issues of *Madupuwath*, an environmental magazine targeting schoolchildren with stories and news articles relevant to the Maduganga area. The grant allowed MDF to improve the magazine's design and layout

to make it more attractive, and covered the printing costs of the first three issues. Production of the next nine issues was funded from the sales of previous issues. Issues 5 to 12 were printed in colour in editions of 1,000 copies. They were sold for US\$0.26 at local bookshops and schools, and at the MDF office.

Challenges

The project faced a delay in implementation caused by a change of administration, but was eventually able to bring awareness of the importance of conserving mangroves into the school curriculum.

CONTACT INFORMATION

Maduganga Development
Foundation (MDF)

373C Galle Road, Pathegamgoda,
Balapitiya, Sri Lanka

Tel: +94 77 9714278

Contributions to cross-cutting themes

Communications and gender equality

The project was entirely in the field of communications, and targeted both men and women, including boys and girls, as producers and readers.

Lessons learned

A publication can raise community awareness and promote involvement in environmental conservation. However, a market analysis should be carried out before publishing any periodical that depends on sales revenue for its long-term sustainability.



Mr Gunadasa de Silva, founder of the Maduganga Development Foundation © MFF

5.26 Educating people about the threats to the Maduganga ecosystem



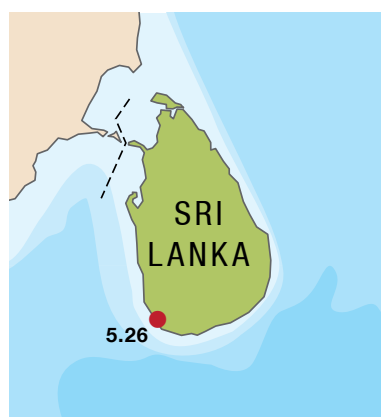
Students test samples, Maduganga, Sri Lanka © LUSSS

environment. So it is crucial that information on the wetland's values and importance is highlighted in schools and villages.

This project sought to give the communities in Maduganga a basic environmental education to help them understand the need to protect the mangroves around the islands in the estuary. It hoped to kindle interest and involvement in conserving the estuary's mangroves by showing how the livelihood and well-being of the community depend on them.

Target beneficiaries

Schoolchildren from Ambalangoda and Balapitiya, as well as community members from Galmanduwa, Pathegama and Maduwa islands in the Maduganga estuary.



LOCATION

Maduganga, Sri Lanka

PRIORITY POWS

Civil Society Engagement

DURATION

One year

MFF GRANT AMOUNT

US\$4,320

Objectives

The main objective of this project was to inform local people of the threats to the Maduganga ecosystem, and the need for collective action to conserve it as a valuable resource, through a specially devised education programme. The project also aimed to transfer knowledge and skills to schools and the community, and to develop a resource centre for environmental studies at the Sarvodaya Multi-Purpose Community Centre (MPCC).

Background

The mangroves around the Maduganga wetland are under serious threat from the activities of nearby communities. Lanka Jathika Sarvodaya Shramadana Sangamaya (or just Sarvodaya), one of the largest NGOs in Sri Lanka, works closely with Maduganga communities. Sarvodaya has observed that communities around the wetland are either indifferent or unaware of the adverse changes in the Maduganga ecosystem. They also noted that communities lack the ability to identify, measure, and keep track of changes in the

Outputs

- Delivery of environmental education programmes for young people and community members.
- Production and distribution of leaflets.
- Monitoring data on changes in selected parameters of the wetland ecosystem.
- Replanting of Galmanduwa island and its mainland approach with mangroves.
- Equipping of a laboratory and museum at Sarvodaya MPCC.
- The establishment of a library at Sarvodaya MPCC.

Accomplishments and challenges

Through this project, the community learned about the importance of mangroves and gained a better understanding of why they need to be protected. On the ground, Galmanduwa island was replanted with man-

groves and Sarvodaya MPCC furnished with a well-equipped laboratory, museum and library.

Challenges

Multiple difficulties were faced in achieving these goals. First, changing the attitudes of community members and persuading them to give priority to the environment is difficult when people are poor and depend on natural resources for their livelihoods. The communities bordering the Maduganga wetland do not appreciate that the changes in the ecosystem, some of which they recognise themselves, arise largely from their own lifestyles and occupations. The paid rehabilitation and reconstruction work after the 2004 Indian Ocean tsunami also has led people to expect payment for any work they do for the common good.

Contributions to cross-cutting themes

Communications

As part of the effort to communicate with the communities on the value of the local eco-

system and the importance of conserving it, posters were displayed publicly and leaflets were disseminated.

Gender equality

Both men and women were educated and informed about the values of the ecosystem at Maduganga.

Lessons learned

One important lesson is that persistence leads to success. Sarvodaya persisted in its efforts to educate and encourage the communities, ultimately persuading them to carry out mangrove planting.

For the local schoolchildren, the project designed laboratory work based on their GCE (General Certificate of Education) syllabuses. This not only supported the students' examination studies but also contributed to the monitoring of environmental changes.

In sum, the project demonstrated that the community can and should be empowered to conserve and protect its local environment.

CONTACT INFORMATION

Lanka Jathika Sarvodaya
Shramadana Sangamaya

98 Rawatawatte Road,
Moratuwa, Sri Lanka

Tel: +94 11 2655255

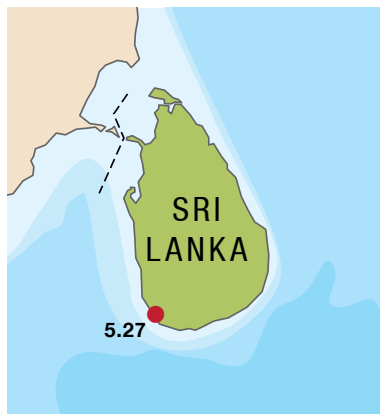
5.27 Enhancing schoolchildren's knowledge of mangrove ecosystems by training their teachers



mary school students (grades 1–3) includes environmental topics, but, because teachers lack proper training and guidance, their efforts fall short of the desired outcomes. Recognising this constraint, the Ecocare Centre for Environmental Education and Conservation (ECO-CEN), an NGO which works on environmental education in schools, stepped in to provide teachers in selected primary schools in Balapitiya and Karandeniya Education Divisions, Galle District, with a refresher course and training tools.

Target beneficiaries

The direct beneficiaries were teachers and schoolchildren in the Maduganga area. Indirect beneficiaries included government bodies responsible for conservation.



Objectives

This project had two main objectives:

- 1 to introduce environmental activities for primary schoolchildren around Maduganga in support of the national curriculum; and
- 2 to train teachers of selected schools in conducting environmental activities and communicating environmental messages to their students.

Background

Conserving natural ecosystems in Sri Lanka has become increasingly difficult because of conflicts with communities' attitudes and habits. People exploit mangrove ecosystems, often in response to poverty, and so contribute to environmental degradation and continued social and economic deprivation. This project sought to change the attitudes of the younger generation and strengthen understanding in local communities of how to use ecosystems in non-destructive ways.

The current curriculum for Sri Lanka's pri-

Outputs

- ▶ Preparation of a teachers' guide for primary school classes.
- ▶ Preparation of a set of 13 CDs with 38 documentary films on the environment.
- ▶ Preparation of a set of 5 CDs on project activities as a teaching tool, and a CD on mangrove ecosystems as a teaching aid, for 54 schools.
- ▶ Raised awareness among local teachers of the importance of the Maduganga River and its surroundings.
- ▶ Introduction of "The Song of Culture of Maduganga" in the teachers' guide.
- ▶ Selection of the "Seed Game" which uses Kaduru (*Cerbera* spp.) seeds, as the Game of Maduganga.
- ▶ Nomination of the rathamilla (*Lumnitzera littorea*) flower as the flower of Maduganga.

LOCATION

Maduganga, Sri Lanka

PRIORITY POWS

Civil Society Engagement

DURATION

One year

MFF GRANT AMOUNT

US\$4.386

- Introduction of E-learning and use of new technology to local schools.

Accomplishments and challenges

As a result of the project, local teachers became interested in the environment of Maduganga and better equipped in terms of environmental knowledge, teaching skills and teaching aids. The area gained a pool of primary school teachers well-versed in teaching environment-related topics, and in producing teaching guides and educational tools. These teachers can be deployed to assist the 32 schools not covered by the project.

The project provided education on mangroves and ecosystems through new tools of learning such as computers. Traditional culture was also used in innovative ways: a song and a seed game were introduced, and the flower of rathamilla (*L. littorea*) nominated as the flower of Maduganga.

Challenges

Some older teachers were not ready to accept new concepts and teaching methods, and were reluctant to use new technology and modern equipment. The planned activities of the project also had to be redesigned on certain occasions to suit the curriculum as teachers hesitated to spend time on new activities. Most local schools do not have computers and those that exist are not maintained properly. For these reasons, the teachers' guide had to be revised several times, resulting in extra time spent and extra costs.

Another challenge was the poor public image of NGOs, which made it hard to win community support during the early stages of the project.

Contributions to cross-cutting themes

Communications

The project was notable for the large amount of communications materials it produced on CDs. These comprise a CD on mangrove ecosystems, a set of five CDs with project activities, and a set of 13 CDs with 38 documentary films on the environment. The project also produced a CD of traditional Sri Lankan harvest songs titled *Songs for the Environment*.

Gender equality

The project targeted all schoolchildren and teachers irrespective of their gender.

Lessons learned

A difference can be made by changing the educational system to incorporate environmental studies as a subject. This can help to influence attitudes in the younger generation by teaching them about conservation methods and the importance of the Maduganga wetland.

If the project's outputs are sustained, teachers will approach their classes with greater enthusiasm and confidence; and both students and teachers will enjoy the learning experience more. Before long, schoolchildren in the Maduganga area will have a sound foundation for understanding environmental issues. Their knowledge of the Maduganga wetland ecosystem and its importance should motivate them to protect and conserve their natural heritage.

One important lesson was that, before starting a project of this type, it is important to assess the situation on the ground directly rather than rely on secondary information.

CONTACT INFORMATION

Ecocare Centre for Environmental Education and Conservation (ECO-CEN)

Environmental Information Centre, YMBA Building, Fort, Galle, Sri Lanka

Tel: +94 91 2227077

5.28 Removing pond apple from parts of the Maduganga wetland

Area cleared of *A. glabra*, Maduganga, Sri Lanka © R. Mahindapala



Balapitiya, secured a small grant from MFF to control the spread of this invasive species and restore affected mangrove areas.

Target beneficiaries

The Maduganga wetland community, including students and visitors.

Outputs

- Clearing of pond apple from an area of 0.2 hectares.
- Planting of 1,800 seedlings of *Rhizophora mucronata*.

Accomplishments and challenges

The project managed to remove pond apple growth and replant mangroves in a part of the wetland. It also increased the community's appreciation of the importance of mangroves through an awareness workshop.

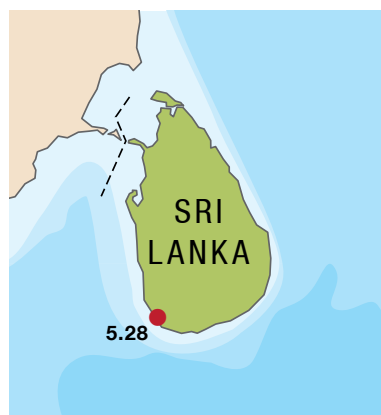
Challenges

Although the original plan was to clear an area of 0.6 hectares, hire charges for back-hoes rose after the proposal was submitted and their use had to be curtailed. Further, project administration was time-consuming and difficulties were encountered in getting the necessary approvals to carry out activities.

Lessons learned

It is only through raising awareness that the community can learn how to protect and conserve mangroves. The project's efforts in this respect encouraged the community to get involved in replanting mangroves, and also stimulated the interest of schoolchildren in learning more about forest values.

MDF is committed to monitoring the growth of the replanted area, identifying and if necessary removing any regrowth of *A.*



Objectives

The objectives of this project were to remove the invasive species *Annona glabra* from selected locations in the Maduganga wetland, and to restore these areas through mangrove replanting.

Background

A. glabra, commonly known as pond apple, is an aggressive, invasive tropical fruit tree which grows in wetland areas and can choke mangrove swamps. Its seedlings carpet the banks of watercourses, preventing other plant species from germinating or growing. The dense thickets it forms can gradually replace everything else in the canopy, and pose a threat to the survival of native wetland and mangrove communities.

The Maduganga wetland in south-west Sri Lanka has been designated a Ramsar Wetland of International Importance. In recent years, several areas of the wetland have been threatened by pond apple growth. The Maduganga Development Foundation, an NGO based in the nearby community of

LOCATION

Maduganga, Sri Lanka

PRIORITY POWS

Strategies for Management
Civil Society Engagement

DURATION

Ten months

MFF GRANT AMOUNT

US\$3,842

glabra. It is expected, however, that clearing pond apple from the area will facilitate rapid natural regeneration of the native plant community.

CONTACT INFORMATION

Maduganga Development
Foundation (MDF)

373C Galle Road, Pathegamgoda,
Balapitiya, Sri Lanka

Tel: +94 77 9714278

5.29 Improved community management of the Maduganga wetland

Demonstrating the solar-powered lamp, Maduganga, Sri Lanka © K. Ekaratne



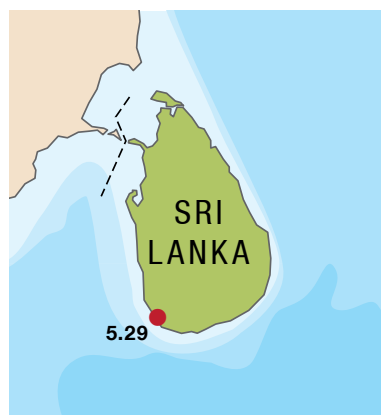
In particular, the project aimed to supply local fishermen with an environmentally friendly and cost-effective replacement for the kerosene lamps they generally use for night fishing. Each fishing boat is estimated to use one litre of kerosene nightly, costing US\$0.75. In a pilot initiative, the Nagenahiru Foundation gave 18 fishermen electric lamps, charged in the daytime by two community-operated solar-powered units.

Target beneficiaries

Community members living around the Maduganga estuary.

Outputs

- Improvements to Pathamulla Mangrove Education Centre.
- Delivery of 16 awareness programmes and 23 education camps.
- Provision of 18 solar-powered LED/CFL lamps to 18 fishermen.
- Provision of two community-operated solar-powered charging units.
- Training for 50 women in reed handicraft production.
- Training for 50 women in organic home gardening.
- Establishment of a model mangrove nursery and planting of 3,000 mangrove seedlings.
- Creation of an environmental task force with 100 members.



LOCATION

Maduganga, Sri Lanka

PRIORITY POWS

Civil Society Engagement

DURATION

Eight months

MFF GRANT AMOUNT

US\$4,386

Objectives

This project had four main objectives:

- ❶ to raise awareness of the importance of the Maduganga ecosystem;
- ❷ to pilot alternative livelihood activities for those engaged in harmful practices;
- ❸ to safeguard the health of the wetland ecosystem; and
- ❹ to establish an environmental task force to conserve the wetland ecosystem.

Background

The mangroves of the Maduganga estuary play important ecological, economic and social roles. Conserving this ecosystem is vital, which means teaching local communities how to manage and protect it for future generations. The Nagenahiru Foundation, a local NGO, created an eight-month programme to highlight the importance of mangroves and develop alternative sources of income for enhancing livelihoods without damaging the forests.

Accomplishments and challenges

People's attitudes towards conserving the wetland have changed. The community has gained insights into the importance of

mangroves and the environment, and has become more enthusiastic about protecting the ecosystem. In practical terms, participants planted 3,000 mangrove seedlings in an effort to restore degraded coastal vegetation.

The project also helped the Pathamulla Mangrove Education Centre to educate schoolchildren and local people about the importance of safeguarding the coastline.

Fishermen switched from polluting kerosene lamps to more environmentally friendly electric lamps. This eliminated the emission of 3.15 kg of carbon dioxide and kerosene fumes by each lamp, each night. Each fisherman also saves about US\$220 annually in kerosene costs.

Women were trained in handicraft production and organic home gardening methods to supplement their income and give them economic opportunities on a par with men. They can now make a greater contribution to their family's income.

Challenge

One challenge faced by the project was constant flooding, which hindered the growth of the replanted mangrove seedlings.

Contributions to cross-cutting themes

Communications

An environmental exhibition was mounted by schoolchildren to highlight the importance of the environment.

Gender equality

The project benefited and empowered both men and women. Local communities tradi-

tionally depend on men to bring in the income and women to look after the home and children. Through this project, both men and women were given opportunities to enhance their incomes. Men made savings by using the new lamps. Women trained in handicrafts and home gardening contributed to the well-being of their families and gained some economic independence.

Climate change

The move to electric lamps has eliminated carbon dioxide and other emissions from burning kerosene, reducing the impact of fishing on fishermen's health and the atmosphere.

Lessons learned

The 18 fishermen now enjoy night fishing in a fume-free environment with reduced health risks (constant exposure to noxious kerosene fumes is unhealthy). The new electric lamps allow uninterrupted fishing irrespective of the weather, unlike kerosene lamps which cannot be used in the wind and rain. The fishermen appreciate the economic and environmental benefits of the lamps and have continued to use them.

It is important to educate communities through awareness programmes, and in this respect the Pathamulla Mangrove Education Centre played a key role. Especially important are training courses which will motivate and inspire community members.

Lastly the women targeted in this project have taken well to home gardening and handicrafts, indicating that the project's choice of alternative activities was an appropriate one.

CONTACT INFORMATION

Nagenahiru Foundation

11/4 Patabendimulla,
Ambalangoda, Sri Lanka

Tel: +94 91 2256621

5.30 Empowering fisherwomen by generating additional income from the cultivation of Aloe vera (Phase 1)

Aloe vera plantation managers, Puttalam, Sri Lanka © S. Christensen



local crop-growing conditions are generally unfavourable, alternative ways of generating household income are needed that are cost-effective and environmentally friendly. To this end, the project sought to encourage households to cultivate Aloe vera (*Aloe vera*) to meet the high demand for its products in the medicine and cosmetics industries.

Aloe vera (known locally as *komarika*) is a multi-purpose plant, providing medicine and drink. Aloe gel is the base for soaps, body lotions, skin care products, foot creams and many modern cosmetics, and reportedly has antiseptic properties. The latex is a well-known laxative. In recent years the demand for Aloe vera products has grown rapidly both locally and internationally.

Aloe vera thrives in the dry, sandy conditions around Puttalam lagoon, and wild plants collected from this area have long been used for soaps, lotions, creams and other products by cosmetic manufacturers in Sri Lanka. Using an MFF small grant, the Marine and Coastal Resources Conservation Foundation (MCRCF), an NGO based in Kalpitiya, launched a programme to cultivate Aloe vera on the homesteads of 15 selected fisher families.

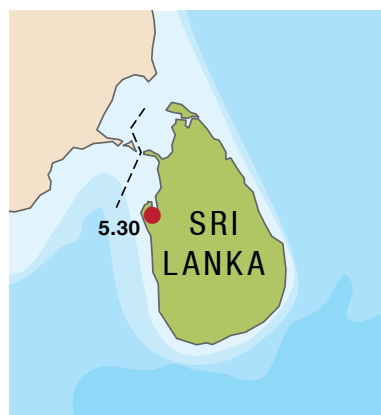
The introduction of a supplementary means of generating income, especially for local women, was considered a feasible approach to reduce fishing pressure. MCRCF implemented the project in collaboration with three local fishery societies: the Semuthu Fisheries Cooperative Society in Kudawa, and the St Sebastian Fisheries Cooperative Societies in Kudawa and Anawasala.

Target beneficiaries

Fifteen fisher families in Puttalam lagoon.

Outputs

- Training of 15 fisher families, especially the women, in cultivating Aloe vera.



LOCATION

Puttalam, Sri Lanka

PRIORITY POWS

Sustainable Livelihoods

DURATION

Five months from January to May 2009

MFF GRANT AMOUNT

US\$4,386

Objectives

This project had four main objectives:

- ❶ to reduce pressure on Bar Reef and its associated marine and coastal resources;
- ❷ to increase the income of poor coastal householders;
- ❸ to empower women; and
- ❹ to stimulate income generation.

Background

Puttalam lagoon is renowned in Sri Lanka for its finfish and crustacean fishery. The lagoon supports over 3,000 fishermen from 28 registered fishery societies, who together are responsible for increasing exploitation pressure on the natural resources. Communities around the lagoon have responded to declining fishery production and rising fuel prices by intensifying their fishing efforts, causing negative impacts on the vital reef ecosystem and its biodiversity. Because land-based income opportunities are limited, and

- Provision of plants and necessary tools to the families. About 575 Aloe vera plants were given to each family.
- The establishment of a buy-back system operated by MCRCF.
- Provision of an improved income-generating activity for 15 fishing families.

Accomplishments and challenges

Fifteen poor fisher families now have an alternative source of income. The project also successfully linked the families to Janet Ayurveda, a cosmetics company wanting to procure Aloe vera for its products.

Self-confidence was built up among poor families who used to be engaged only in fishing activities. More fishermen now focus on cultivating Aloe vera and spend less time fishing.

Contributions to cross-cutting themes

Gender equality

Aloe vera cultivation has been aimed primarily

at women, giving them a livelihood of their own and empowering them economically.

Lessons learned

Demand for Aloe vera plants has grown rapidly among fisher families. A plant nursery should be established to meet this demand.

Mulching is required, but chemical fertilisers are unnecessary. Too much shade has a negative impact on plant growth.

The creation of market linkages by MCRCF was an important contributor to success. With MCRCF's support, an Aloe vera cultivators' society was formed and links made to reputable private companies, allowing households to expand cultivation.

The diversification of livelihoods has helped to reduce pressure on coastal ecosystems and resources, as fishermen spend more time on cultivation and less time fishing.

MCRCF is continuing to support the project by giving free technical advice to local people interested in cultivating Aloe vera. More and more fisher families are turning to Aloe vera cultivation as it is proving to be not just a supplement to their income but also a profitable business in its own right.

“The project built trust in the alternative livelihood option among the communities dependent on coastal resources.”

— HASANTHA AMARASEKERA
PROJECT MANAGER, MCRCF

CONTACT INFORMATION

Marine and Coastal Resources
Conservation Foundation (MCRCF)

School Lane, Kandakuliya North,
Kalpitiya, Sri Lanka

Tel: +94 32 3292516

5.31 Empowering fisherwomen by generating additional income from the cultivation of Aloe vera (Phase 2)



Harvesting Aloe vera, Puttalam, Sri Lanka © K. Ekaratne

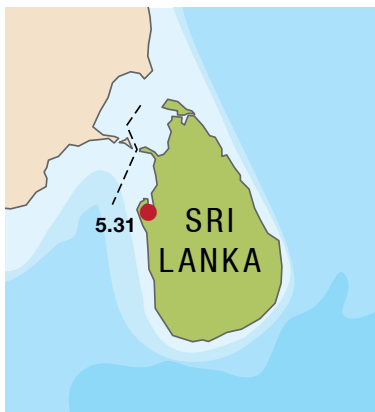
hold incomes, the local NGO Marine and Coastal Resources Conservation Foundation (MCRCF) proposed introducing household cultivation of Aloe vera (*Aloe vera*, known locally as *komarika*). To ensure the sustainability of this activity, MCRCF sought to establish strong market linkages with businesses demanding Aloe vera products.

Target beneficiaries

Fifteen fisher families.

Outputs

- ▶ Training of 15 fisher families, especially the women, in cultivating Aloe vera.
- ▶ Provision of plants and necessary tools to the families. About 575 Aloe vera plants were given to each family.
- ▶ The establishment of a buy-back system operated by MCRCF.
- ▶ Provision of water pumps to ten fishing families for garden watering.
- ▶ Construction of two tube wells.
- ▶ Installation of two drip irrigation systems.
- ▶ Provision of an improved income-generating activity for 15 fishing families.



LOCATION

Puttalam, Sri Lanka

PRIORITY POWS

Sustainable Livelihoods

DURATION

Five months from July to November 2009

MFF GRANT AMOUNT

US\$4,386

Objectives

This project had four main objectives:

- ❶ to reduce pressure on Bar Reef and its associated marine and coastal resources;
- ❷ to increase the income of poor coastal householders;
- ❸ to empower women; and
- ❹ to stimulate income generation

Background

The coastal community of Kudawa village faces the dual challenge of declining natural resources and an increasing cost of living. To compensate, community members have been intensifying their use of coastal resources, leading to accelerated degradation of the coastal ecosystem and declining biodiversity. Urgent action is needed to introduce alternative means of generating income, ideally ones that are cost-effective and environmentally friendly. To this end of reducing poverty and increasing house-

Accomplishments and challenges

The project built up trust in the community, strengthening relationships between people through closer integration and collaborative action. Fisher families gained self-confidence from earning a supplementary income. They spent less time at sea and more time on land helping with cultivation.

The project transformed 1.6 hectares of bare land into a productive Aloe vera plot. It increased the number of home gardens

with water pumps. The participating families improved their skills in record keeping and maintaining their gardens. Market linkages were established with Janet Ayurveda, a leading cosmetics company in Sri Lanka.

Challenges

One drawback is that the fishing families who have converted to cultivating Aloe vera are finding that demand is currently low. Also, knowledge about Aloe vera cultivation is generally lacking among other fishing families.

Contributions to cross-cutting themes

Gender equality

Although it targeted entire families, the project's focus was on empowering women economically.

CONTACT INFORMATION

Marine and Coastal Resources
Conservation Foundation (MCRCF)

School Lane, Kandakuliya North,
Kalpitiya, Sri Lanka

Tel: +94 32 3292516

Lessons learned

Participating in developing an alternative livelihood strengthened the self-confidence of community members. Once they saw how easy, cheap and profitable Aloe vera cultivation can be, they became interested in trying it themselves. Now that they have more experience of the business of cultivation, they remain positive about its benefits and are prepared to continue their work.

Despite the current weakness of demand, the future looks promising as market linkages have been formed and an Aloe vera cultivator's society set up under the guidance of MCRCF, which is also giving free advice to cultivators.

The success of this project has led other community members to start cultivating Aloe vera of their own accord.

"Since my first Aloe vera harvest in December 2009, I have deposited US\$304 in my two daughters' savings bank account."

— DEEPIKA ENAT EDIRISINGE
PROJECT BENEFICIARY,
ANAWASALA, KALPITIYA

5.32 Sustainable livelihood development for low-income families in the Puttalam lagoon area



Handicraft livelihoods, Puttalam, Sri Lanka © R. Mahindapala

Target beneficiaries

Forty low-income families living in the Palavi area of Puttalam.

Outputs

- Establishment of two women's organisations.
- Delivery of awareness programmes on the importance of the local environment.
- Delivery of awareness programmes on gender equality and human rights.
- Organisation of an educational trip.
- Delivery of four training events on business-related topics.
- Active engagement of 40 women in business ventures.

Accomplishments and challenges

Women were empowered to build a livelihood for themselves without needing help from the men in their family. Such women's development activities often have far-reaching impacts extending beyond the boundary of the household.

Contributions to cross-cutting themes

Gender equality

This project targeted women, helping to empower them economically.

Lessons learned

To ensure the sustainability of projects aimed

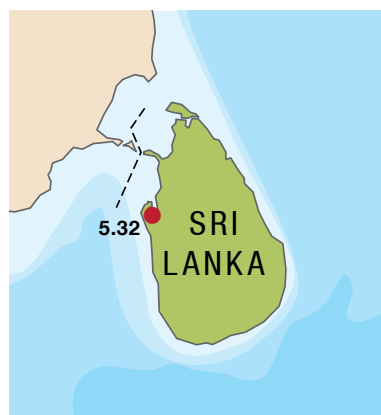
Objectives

The project had two main objectives:

- 1 to develop the skills and knowledge of 40 underprivileged women from all ethnic groups living next to Puttalam lagoon; and
- 2 to improve the socio-economic status of 40 families through the introduction of environmentally friendly alternative livelihoods.

Background

This project focused on enhancing the livelihoods of women from 40 low-income families living in the vicinity of Puttalam lagoon. It aimed to increase women's self-confidence and empower them economically through awareness programmes on gender equality and human rights, and through the provision of loans for small business ventures.



LOCATION

Puttalam, Sri Lanka

PRIORITY POWS

Sustainable Livelihoods

DURATION

Six months

MFF GRANT AMOUNT

US\$3,939

at supporting underprivileged communities, it is essential to involve community members in project design, seek their cooperation in every activity from the outset, and give them responsibility for the project's success.

Also important is giving participants space to solve problems and manage conflicts amongst themselves without outside interference.

CONTACT INFORMATION

Wilpotha Women's Savings Effort

527, Wilpotha, Chilaw,
Sri Lanka

Tel: +94 60 2321380



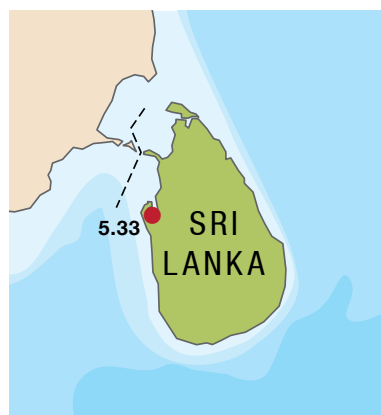
Handicraft class, Puttalam, Sri Lanka © K. Ekaratne

5.33 Replanting mangroves and introducing eco-friendly home gardening



Compost preparation, Puttalam, Sri Lanka © K. Ekaratne

- Creation of environmental awareness.
- Establishment of 30 home gardens.
- Provision of training in composting.
- Demonstration of soil conservation methods.
- Establishment and maintenance of a mangrove nursery.
- Establishment of wind breaks and live fences.
- Mounting of a drawing exhibition.
- Monitoring and evaluation of home gardens, fruit plants and trees.
- Replanting of mangroves on a 0.4-hectare area using 2,000 plants of *Rhizophora* sp. and two other species.



LOCATION

Puttalam, Sri Lanka

PRIORITY POWS

Strategies for Management
Sustainable Livelihoods

DURATION

Six months

MFF GRANT AMOUNT

US\$3,904

Objectives

This project sought to conserve the mangrove environment of Kalpitiya lagoon and develop agricultural practices such as home gardening.

Background

The area around Kalpitiya lagoon, which lies next to Puttalam lagoon, is characterised by shallow water tables and permeable soils prone to leaching. These make its groundwater particularly vulnerable to contamination from the chemicals used in farming. Further, high rates of soil erosion cause sedimentation of silt in the lagoon's mangrove ecosystem. Together, soil erosion and excessive use of chemicals have led to groundwater pollution and degradation of mangrove ecosystems in the area.

Target beneficiaries

Thirty men and women of the communities living next to Kalpitiya lagoon

Outputs

- Local group building and capacity development.

Accomplishments and challenges

As a result of the project, the fishing communities around Kalpitiya lagoon are more aware of the importance of the mangroves. Their community network has been strengthened, enhancing sharing of knowledge among villagers. A mangrove nursery was successfully established to supply replanting, and will continue to be maintained. Encouraged by the positive results and benefits of home gardening, project beneficiaries have been motivated to adopt it as an additional source of food and income.

Challenges

One drawback of the project was a lack of participation. Another was the lack of mangrove maps and related information, which hindered implementation of mangrove replanting and the nursery programme. A severe drought lasting 5–6 months also

delayed mangrove replanting and planting of home gardens, and limited watering of crops.

Contributions to cross-cutting themes

Communications and gender equality

The project mounted a drawing exhibition to create environmental awareness, and sought to involve both women and men in its activities.

Lessons learned

Mapping and planning of destroyed or degraded mangrove areas are needed to support any replanting programme, and con-

stant awareness-raising efforts are needed to instil local appreciation of the importance of mangroves.

Successes were achieved in two main areas. First, the target communities developed an interest and desire in protecting the mangrove ecosystem. Second, the project introduced the communities to home gardening as an alternative means of providing food and cash income.

The activities started by the project have now been integrated with a larger agricultural development programme, helping to support the planning, implementation and monitoring that will ensure their long-term sustainability.

CONTACT INFORMATION

Sewalanka Foundation

432A, 2nd Floor, Colombo Road,
Boralasgamuwa,
Sri Lanka

Tel: +94 47 5675614

5.34 Community-based mangrove planting at Kurakkanhena

Community-based mangrove planting at Kurakkanhena, Sri Lanka © K. Ekaratne



is now threatened by degradation of the rich mangrove stands bordering the lagoon caused by population growth, economic development and a general lack of environmental awareness.

Around 100 families in the area cut mangroves for the firewood trade, for fuelwood, and to clear land for prawn culture. This pressure on the ecosystem has affected its biodiversity and productivity – fish populations have declined dramatically, reducing catches and fishing incomes. Limited awareness of the value of mangroves and a lack of community involvement have made this trend difficult to reverse, creating an urgent need for interventions to rehabilitate degraded mangrove forests and institute proper community-based management.

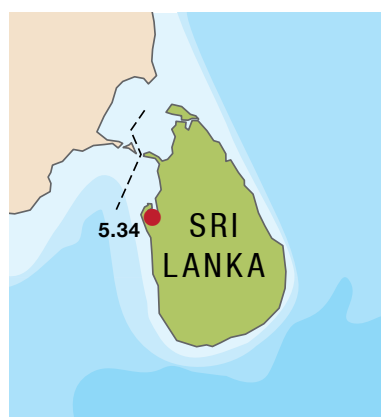
A leading local fishery society, the Semuthu Fisheries Cooperative Society Ltd, secured a small grant from MFF to restore the dwindling mangrove vegetation around part of the lagoon, educate local people and schoolchildren on the value of mangroves, and develop alternative livelihoods. Project activities were implemented in partnership with the St Mary's Fisheries Cooperative Society of Kurakkanhena.

Target beneficiaries

Fisher families in Kurakkanhena village.

Outputs

- Training for community members in nursery establishment and management.
- Establishment and management of seven community-based mangrove nurseries.
- Implementation of a community-based mangrove replanting campaign.
- Planting of 10,000 mangrove propagules on a 0.4-hectare plot, and fencing of the plot.



LOCATION

Puttalam, Sri Lanka

PRIORITY POWS

Strategies for Management
Community Resilience

DURATION

Six months

MFF GRANT AMOUNT

US\$4,232

Objectives

This project had four objectives:

- ❶ to enhance awareness of the value of mangroves;
- ❷ to demonstrate approaches to successful mangrove restoration;
- ❸ to prevent further destruction of mangroves; and
- ❹ to develop alternative livelihoods.

Background

Puttalam lagoon on Sri Lanka's north-west coast is noted nationally for its high biodiversity. The lagoon encompasses about 600 hectares of mangroves, 700 hectares of salt marshes, extensive mud flats, seagrass beds, and the estuaries of two rivers, the Kala Oya and Mee Oya.

The village of Kurakkanhena lies on the northern side of the lagoon. Like other communities living around the lagoon, the main livelihood of Kurakkanhena is fishing. This

- Delivery of awareness programmes for schoolchildren and community members.
- Production of brochures on mangroves in the Sinhala and Tamil languages.
- Provision of fuel-efficient firewood-gas stoves to 30 families.

Accomplishments and challenges

The project selected appropriate species and sites for replanting after assessing the existing natural vegetation in the area. It established seven mangrove nurseries, and provided seeds and other necessary materials and equipment. The mangrove planting was carried out with species such as *Rhizophora* spp., *Avicennia* spp., *Excoecaria agallocha* and *Lumnitzera racemosa*. Community members took part in the replanting campaign and helped to fence off the planted area to protect it from grazing animals.

Members of St Mary's Fisheries Cooperative Society who took part in project activities acquired a high level of competence in mangrove nursery maintenance. The Kurakkanhena Fisheries Society asked for the district forest officer to act as guardian of the Kurignanpitiya mangrove forest, which the community helped restore.

The project conducted awareness programmes for schoolchildren and members of St Mary's Fisheries Cooperative Society on the importance of mangroves and mangrove fauna. Nearly 400 students from three schools, and 65 members of the Cooperative Society, participated in these activities, auguring well for future sustainability.

The project also supplied fuel-efficient firewood-gas stoves to 30 families to encour-

age them to reduce the amount of wood they cut from mangroves. These stoves helped to reduce the consumption of firewood, and also increased awareness of the threats to mangroves among project beneficiaries.

Challenges

The challenges faced by the project included a lack of information on mangrove restoration techniques, poor weather during the planting programme, and an inadequate amount of time to tend the planting until it was properly established. However, a five-member committee was formed to tend the replanted plot under the support and guidance of the Marine and Coastal Resources Conservation Foundation (MCRCF), a local NGO.

Contributions to cross-cutting themes

Communications

Mangrove awareness brochures in the Sinhala and Tamil languages were produced with support from MCRCF and disseminated to schoolchildren and community members.

Lessons learned

Since changing weather conditions can have an impact on tree growth and undermine replanting efforts, it is important to build flexibility into the project schedule from the outset. Donors should consider this constraint when disbursing funds. Projects of this nature should also last for at least 18 months if they are to have appreciable results.

Future projects should aim to build knowledge and experience of working with mangrove species other than *Rhizophora* and *Bruguiera*, and to that end should promote a dialogue between practitioners and scientists.

"The fuel-efficient stoves provided through the project enabled us to cut our fuelwood usage by 40% to 50%."

— MS G. SUBASHINI FERNANDO
PROJECT BENEFICIARY

CONTACT INFORMATION

Mr H. S. Amarasekera
Consultant

Semuthu Fisheries Cooperative
Society Ltd,
Puttalam, Sri Lanka

Tel: +94 77 2263365

5.35 Replanting mangroves in the Dutch Canal to enhance ecosystem productivity

Replanting mangroves in the Dutch Canal, Sri Lanka © R. Mahindapala



fisheries industry. In recent times, however, the mangroves lining the Canal's banks have been cleared illegally to set up prawn farms.

The consequences of this loss and degradation of forests have included the reduction of finfish and crustacean catches, a decline in biodiversity, irregular water flows, and the drying up of natural springs. Sri Lanka's National Aquaculture Development Authority (NAQDA) obtained a small grant from MFF to restore a section of the degraded mangrove area along the Canal.

As part of the rehabilitation of the prawn aquaculture industry in Puttalam, NAQDA has been implementing a programme to dredge the Dutch Canal, the main source of water for local prawn farmers, to improve its flow. Its long-term objective, to which this project contributed, is to improve the water quality of the canal ecosystem and its associated fish breeding grounds, and so improve the income of the local fishing community.

Target beneficiaries

The fishing community and water users along the Dutch Canal in Puttalam district.

Outputs

- Planting of 11,080 mangrove plants at three different sites.
- Installation of signboards at the three planting sites.
- Establishment of a demonstration plot with 75 different species of plants found in mangroves.
- Delivery of two awareness programmes.
- Training for 95 farmers.

Accomplishments and challenges

The project increased community awareness of the importance of mangroves and the

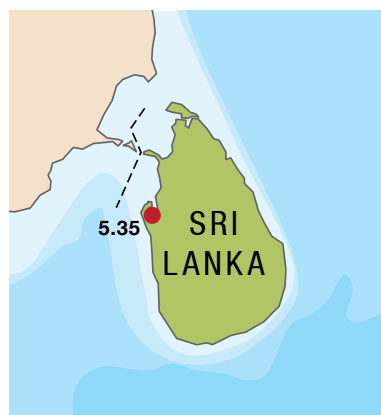
Objectives

This project had four main objectives:

- 1 to improve the water quality of Puttalam lagoon;
- 2 to increase the availability of fish breeding grounds;
- 3 to increase the income of the local fishing community; and
- 4 to protect the natural environment of the Dutch Canal.

Background

The Dutch Canal was constructed during the time of Dutch control over the maritime districts of Sri Lanka (then Ceylon). Once a popular supply route linking Colombo with Puttalam, this 100-km canal is still an important source of water for communities on Sri Lanka's north-west coast from Negombo to Puttalam lagoon. The Canal and the areas around Puttalam lagoon have played an important historical, economic and ecological role in the development of Sri Lanka's



LOCATION

Puttalam, Sri Lanka

PRIORITY POWS

Reef to Ridge
Civil Society Engagement

DURATION

Nine months

MFF GRANT AMOUNT

US\$4,386

efforts to restore and enhance the canal ecosystem. A total of 11,080 mangrove plants were planted, and by the end of 2009 overall survival rates were around 80%. Most seedlings were planted only in November 2009, however. It is hoped that the establishment of a demonstration plot, the awareness programmes organised for schoolchildren, and the involvement of the community in project activities, will motivate beneficiaries to protect the replanted areas.

Challenges

One problem encountered was that the planting site at Pulidvayal had to be rejected because of social conflict, forcing the project to move to another location. Also, replanting

at the site in Viruthodei was interrupted by flooding.

Lessons learned

The project learned important lessons about planting mangroves. One is that good quality seedlings are scarce. Another is that the timing of seed availability should be considered when planning project activities. Also, for the best results, *Rhizophora* spp. should be planted at a spacing of one metre; *Avicennia marina* at 50 cm.

The time allocated by the project for replanting was inadequate for monitoring of results. Follow-up activities will be carried out by NAQDA prawn farm monitoring units, together with farmers.

CONTACT INFORMATION

National Aquaculture Development
Authority (NAQDA)

758 Baseline Road, Dematagoda,
Colombo 9, Sri Lanka

Tel: +94 11 4721676

5.36 Fuel-efficient stoves for coastal communities

Fuel efficient stove, Puttalam, Sri Lanka © K. Ekaratne



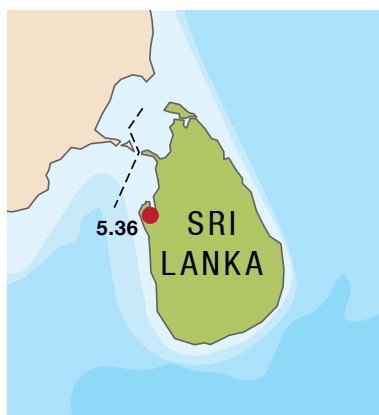
- Restoration of the local lagoon area with 4,000 mangrove plants.
- Planting of 0.2 hectares with an alternative fuelwood species.
- Delivery of five awareness programmes for regular mangrove users.
- Delivery of four awareness programmes for 200 schoolchildren.

Accomplishments and challenges

Fuel-efficient stoves were supplied to 390 households: 300 in Palavi village by the Vinivida NGO Coalition for Eradicating Poverty through Knowledge and Communication; 60 in Ammathota Fishing Village by PEARLS (Peaceful Environment Assured Right Lasting Solutions); and 30 in Kurakkanhena village by the Semuthu Fisheries Cooperative Society Ltd.

The fuel-efficient stoves, a new technology for the area, were adopted and actively used by all beneficiary households. Users reported that the time taken to cook a standard dhal curry with the fuel-efficient stove was less than that of the conventional open hearth. Overall, the fuel-efficient cooking stoves reduced fuelwood usage by 40% to 50%. Further, due to the stoves' higher efficiency, women spent less time preparing meals for the family and more time on other pursuits.

The lagoon area around the three villages was also replanted with 4,000 mangrove plants, but a *Gliricidia* fuelwood plantation was affected by drought, reducing the impact of the project. Nevertheless, the community was involved in the replanting of the mangroves and local schoolchildren learned about the importance of intact mangrove ecosystems.



LOCATION

Puttalam, Sri Lanka

PRIORITY POWS

Strategies for Management

DURATION

One year

MFF GRANT AMOUNT

US\$3,947

Objectives

The objective of this project was to rehabilitate and conserve threatened mangrove ecosystems using participatory approaches.

Background

The mangrove ecosystem around Puttalam lagoon is under threat from over-exploitation and neglect. Urgent action is needed to protect the remaining mangroves and rehabilitate degraded forest areas. In the three lagoon villages of Palavi, Pallivasalthurai (Ammathota Fishing Village) and Kurakkanhena, villagers – like villagers across Sri Lanka – use wood, including wood from mangroves, as fuel for cooking. To reduce wood consumption and reduce pressure on mangroves, fuel-efficient stoves were introduced to 390 households as a sub-activity of three separate projects.

Target beneficiaries

390 households in three lagoon villages.

Outputs

- Supply of 390 cooking stoves.

Contributions to cross-cutting themes

Gender equality

This project targeted both men and women as beneficiaries.

Lessons learned

Cooperation with the Grama Niladhari (government-appointed village leader) is vital for the successful implementation of project activities. Weather conditions must also be considered when planning project activities.



Making a fuel efficient stove, Puttalam, Sri Lanka
© R. Mahindapala

CONTACT INFORMATION

Vinivida NGO Coalition for
Eradicating Poverty through
Knowledge and Communication

Kiriyankalliya, Mudalama,
Sri Lanka

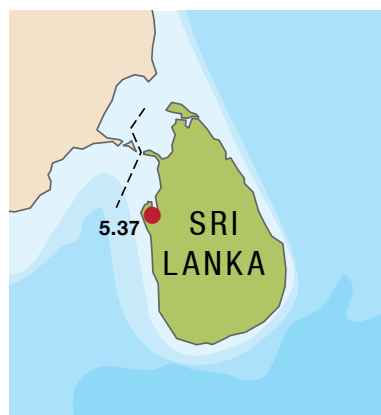
5.37 Preserving Puttalam lagoon for future generations



Crab cages, Puttalam, Sri Lanka © K. Ekaratne

Outputs

- Delivery of awareness programmes and workshops.
- Provision of training in developing home gardens.
- Creation of 15 home gardens.
- Planting of 4,000 *Rhizophora* seedlings.
- Installation of 40 clay stoves to reduce consumption of mangrove wood.
- Provision of cages for crab fattening to three villagers.
- Adoption of goat rearing by nine widows



LOCATION

Puttalam, Sri Lanka

PRIORITY POWS

Strategies for Management
Sustainable Livelihoods

DURATION

Ten months

MFF GRANT AMOUNT

US\$3,882

Objectives

The primary objective of this project was to protect and manage the natural resources of Puttalam lagoon, on which fishing communities have long depended and continue to depend.

Background

This project was implemented in the multi-ethnic fishing village of Ammathottam. A local community-based organisation, PEARLS (Peaceful Environment Assured Right Lasting Solutions), and the Ammathottam Janahanda Fishing Women's Guild worked together to protect the environment and resources of Puttalam lagoon and the Ammathottam shoreline. The project partners aimed to achieve this goal through awareness programmes, replanting of mangroves, home gardening, providing clay stoves to reduce firewood use, and raising incomes through activities such as goat farming and crab fattening.

Target beneficiaries

Families in Ammathottam fishing village.

Accomplishments and challenges

The two main achievements of the project were increased local awareness of the environment and ecosystems of Puttalam lagoon, and increased income-generating opportunities.

In practical terms, 4,000 *Rhizophora* seedlings were successfully established. Clay stoves were enthusiastically adopted by 40 women, and 41 families were given 260 coconut seedlings and seeds for nine varieties of vegetables to cultivate in their home gardens. These have provided vegetables for home consumption and sale, increasing household income. Three villagers were provided with crab cages and trained in using them.

Challenges

One drawback was that some fishermen did not help to protect the newly planted mangroves because they were ignorant of their value. These fishermen have continued to cut down mangroves for construction materials, firewood and other purposes.

Contributions to cross-cutting themes

Gender equality

Women, especially widows, were given an opportunity to earn extra income from home gardening and goat rearing.

Lessons learned

Training and awareness programmes proved vital as the local fishing community knew little about environmental values and threats.

Putting soft-shelled crabs in cages gave

them enough time to harden their shells, thus increasing their market value. Good security measures are essential for crab-fattening activities, however.

Families took to the clay stoves once they realised they are cheaper, easier and quicker to use for cooking. This helped to reduce the demand for mangrove wood as fuel for cooking. The planting of fast-growing tree species such as *Portia* sp. also helped to reduce mangrove cutting, while also providing fodder for livestock.

CONTACT INFORMATION

Peaceful Environment Assured Right
Lasting Solutions (PEARLS)

Kalpitiya Road, Pallivasalthurai,
Puttalam, Sri Lanka

Tel: +94 71 9203154

5.38 Safeguarding mangroves through awareness programmes

Rhizophora mucronata planting at Puttalam, Sri Lanka © K. Ekaratne



Target beneficiaries

The fishing community of Mulipuram at Puttalam lagoon.

Outputs

- Delivery of awareness programmes.
- Organization of an art competition for schoolchildren.
- Delivery of livelihood training programmes.
- Training of local village volunteers in capacity building.
- Installation of signboards informing the community about MFF.
- Planting of one hectare of mangroves.



LOCATION

Mulipuram, Puttalam, Sri Lanka

PRIORITY POWS

Strategies for Management
Civil Society Engagement

DURATION

Eight months

MFF GRANT AMOUNT

US\$4,374

Objectives

The objective of the project was to safeguard the mangroves fringing Puttalam lagoon by raising awareness of their importance among local communities.

Background

Puttalam lagoon is noted nationally in Sri Lanka for its high biodiversity. The lagoon extends over some 600 hectares of mangroves, 700 hectares of salt marshes, extensive mud flats, seagrass beds and the estuaries of two rivers, the Kala Oya and Mee Oya. Fishing is the main livelihood of the communities living around the lagoon.

Over time, the rich mangrove stands bordering the lagoon have been degraded by the collection of fuel wood by local people and by encroachment, including the construction of unauthorised buildings and conversion of forest land to salt pans. Recognising that the illegal destruction of mangroves must be stopped, the leaders of the local fishing communities proposed this project to safeguard the coastal mangrove belt and make people aware of the threats it faces.

Accomplishments and challenges

The community planted one hectare of mangroves and erected signboards informing people about the project and MFF. The awareness programmes and livelihood training programmes gave men, women and children valuable knowledge about mangroves and the coastal environment. As a result, the community is now more aware of the environmental importance of the mangroves bordering the lagoon.

Challenges

At the outset of the project, mobilizing the community proved difficult as they expected too much from NGOs who were unable to meet their expectations.

Not all of the sites identified for replanting mangroves were suitable because of their soil conditions or exposure to waves at high tide.

Lastly, in some sites, mangroves planted close to the seashore were damaged by the activities of fishermen.

Contributions to cross-cutting themes

Communications and gender equality

Signboards were erected to disseminate information to the community, and the beneficiaries of the project included women's groups and women's societies.

Lessons learned

The way a project motivates community members to participate influences the way it achieves its results. Through empowerment, and the support and presence of government officials, communities can be encouraged to contribute strongly to the project. Including

income generation methods also serves as a motivating factor.

The project grantee learned that when restoring deforested mangrove areas, the soil (ideally sandy or finer sediments) has to be stable enough to ensure minimal erosion during tree growth.

The community as a whole learned how to tend and protect mangrove plants. The newly restored mangroves are expected to provide additional vegetation cover for the coast. To ensure their survival, the community, fishermen and forest field officers have continued to monitor the planting sites after the end of project.

CONTACT INFORMATION

Friendly Environmental Cultural
Economic Technological Support
Organization

36 Masjid Road, Puttalam,
Sri Lanka

Tel: +94 32 2265664

Thailand

SGF project achievements

The SGF projects in Thailand targeted areas along the Andaman Sea coast impacted by the 2004 Indian Ocean tsunami, as well as those experiencing ecosystem degradation from human activities such as the clearing of mangroves for prawn farms and other natural forests for rubber and oil palm plantations.

Although the conversion or degradation of coastal ecosystems was previously ignored in Thailand, the widespread loss of coastal habitats has prompted the government to introduce a conservation and restoration policy for mangroves. Many of the SGF projects were able to support this in practice. Mangrove rehabilitation (POW 2) and building community capacity for mangrove ecosystem conservation and management (POW 6) were the main focus of many of the Thai projects.

The status of mangroves and coastal habitats was significantly improved through the collective outputs from the 15 projects. In total, nearly 2,000 hectares of mangrove were demarcated, replanted or rehabilitated in some form.

The projects in Thailand were particularly successful in rehabilitating and demarcating coastal ecosystem management zones, enabling local communities to become more involved in coastal resources conservation and management. Breeding and nursery areas for commercially valuable aquatic species such as clams and crabs were established, and at least one endangered species of otter was protected at one of the project sites (Project 6.6).

With nearly 6,000 households directly involved in SGF projects in Thailand, the experience has led to greater awareness of the value of coastal habitats. Many community groups have also acquired new knowledge and skills to improve their communication and management capacities. To foster knowledge sharing at the community level, new networks have been established and old networks strengthened, and several new youth groups formed.

Conclusions

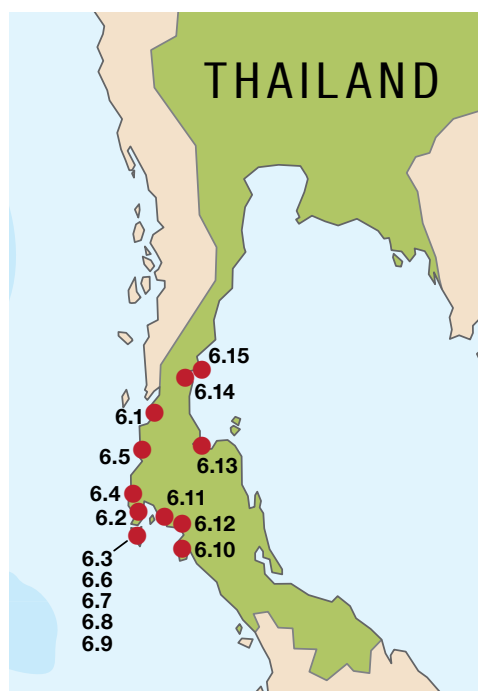
The Thai SGF projects exemplify an important principle (also demonstrated by a number of projects in other countries), namely, that local partners are the primary agent for long-term sustainability. Hence, any improvements in their management capacity increase the likelihood that project innovations will be maintained after the project ends.

The value of involving local authorities and agencies was also well-demonstrated by several projects in Thailand. In some cases this not only resulted in official recognition of the project, but also elicited direct financial or in-kind support from government agencies.

The management capacities of community groups were noticeably strengthened by many of the projects. Communities were also encouraged to develop their own ideas, for example the use of *Nypa* palm to control weeds in mangrove plantations, and to share their successes and concerns with other stakeholder groups such as prawn farmers and tourist operators.

SGF THAILAND PROJECTS

- 6.1 Conserving wetlands on the Andaman coast
- 6.2 Conserving mangroves as a local food source
- 6.3 Raising awareness and promoting the use of local knowledge in managing coastal resources
- 6.4 Building a community network for managing mangroves and other coastal resources
- 6.5 Participatory rehabilitation and conservation of aquatic habitats at Mae Nang Khao
- 6.6 Restoring mangroves for *nak thale* (otters)
- 6.7 Strengthening the capacity of a community network for managing Phuket's coastal resources
- 6.8 Strengthening coastal livelihoods and community-based tourism
- 6.9 Mangroves for the future
- 6.10 Planting *Pandanus* palm to protect mangroves
- 6.11 Rehabilitating mangroves and beach forests at Khlong Prasong
- 6.12 Building community capacity for managing coastal resources at Talingchan
- 6.13 Collective rehabilitation and conservation of mangroves at Ban Don Bay
- 6.14 Rehabilitating and conserving habitats for clams
- 6.15 Strengthening conservation of mangroves and other marine and coastal resources at Thong Toam Yai Bay



General location of SGF Phase 1 projects in southern Peninsular Thailand

6.1 Conserving wetlands on the Andaman coast

Conserving wetlands, Andaman coast, Thailand © S. Serrepaowong



phu villages. Its aim initially was to assist the victims of the tsunami and rehabilitate damaged mangrove areas. Since then, the network has operated continuously to conserve mangroves and other coastal resources with support from public and private organisations such as UNDP, IUCN, Farmers Federation Association for Development, Raks Thai Foundation, World Vision, Save the Andaman Network, and the Thai government's Mangrove Development Station 9.

Target beneficiaries

The main beneficiaries were 120 of the 829 households in the three core villages of the Kapoe Mangrove Rehabilitation Network.

Outputs

- ▶ Nine hectares of rehabilitated mangrove area added to the 256-hectare community protected area by planting *N. fruticans* to provide raw material for income-generating activities.
- ▶ Capacity built among community members and youth groups through active participation in conservation activities.
- ▶ Conservation awareness of at least 60% of the targeted population enhanced through active and more frequent assembly for community activities.
- ▶ Adoption of community regulations for the use of community forests.
- ▶ Conservation of juvenile crabs and juveniles of other aquatic species in an area of about one hectare.



Objectives

This project aimed to ensure the sustainable use of mangroves, maintain biodiversity, and generate supplementary income for local people, especially from the use of the palm *Nypa fruticans*. Its specific objectives were:

- ❶ to demonstrate how mangrove forest rehabilitation supports community livelihoods;
- ❷ to provide communities with knowledge and information on managing mangroves, and raise community awareness of natural resources conservation; and
- ❸ to enhance community participation in managing collective mangrove areas and protecting them against pollution and encroachment.

Background

The Mangrove Rehabilitation Network of Kapoe sub-district in Ranong province was established in 2005, after the 2004 Indian Ocean tsunami, by community leaders from Ban Chi Mi, Ban Darn and Ban Banglam-

Accomplishments and challenges

Participants demonstrated their enhanced capacity for rehabilitation through boundary demarcation, nursery construction, replanting and weeding.

LOCATION

Koh Yai Rang mangrove area, Kapoe, Ranong, Thailand

PRIORITY POWS

Reef to Ridge
Sustainable Livelihoods
Integrated Coastal Planning

DURATION

May 2009 to November 2010

MFF GRANT AMOUNT

US\$9,737

One community adopted an innovative approach to controlling an aggressive climbing weed known as fish bladder (*Canscora pentanthera*). Fish bladder grows well in the open sun and can smother newly planted mangroves. Villagers discovered, however, that planting *Nypa* palm can check weed growth and so reduce the time and labour needed for weeding. The palm is also a good source of supplementary income.

One effective community learning mechanism was a raft in Kapoe Canal. Moored among the mangroves, the raft is used as a floating exhibition for youth conservation activities. Behind the raft, on a mudflat, the

project demarcated two areas as a black crab bank and a mangrove nursery for demonstration and learning.

Challenges

Crab-eating macaque monkeys (*Macaca fascicularis*) uprooted newly planted *Nypa* palms, and crabs also damaged the palm seedlings, making frequent replanting necessary.

Partners and their contribution

The participating communities made cash and in-kind contributions worth US\$3,150 and US\$4,845 respectively.



Andaman coast project stakeholder, Thailand
© S. Sereepaowong

“The project changed people’s attitudes and outlook, encouraging them to be more open and listen more closely to communal concerns.”

— MR WIROJ DEJSONGPRAEK
PROJECT COORDINATOR

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6.2 Conserving mangroves as a local food source

Teaching children how to process food from mangroves, Phang Nga, Thailand © P. Parndam



aquaculture, rubber cultivation and providing services to tourists.

Outputs

- ▶ An increase in capacity and awareness among members of youth and women's groups.
- ▶ Training for 30 people in the importance of intact mangroves as a food source.
- ▶ Compilation of data on 33 plant and 70 animal species found locally.
- ▶ Compilation of local knowledge about mangroves in the form of 70 mangrove-based food recipes.
- ▶ A revival of local learning about mangrove foods among women's and youth groups, with 40 members of the youth group taught to produce food from at least 30 species of tree found in mangroves.
- ▶ Protection of a 320-hectare area of mangroves through a community forest management scheme, with an additional 3,000 mangrove trees planted.
- ▶ Establishment of a conservation zone for crabs.
- ▶ Publication of 100 copies of a Thai language case study of local foods.



LOCATION

Takauthung, Phang Nga, Thailand

PRIORITY POWS

Knowledge for Management
Monitoring, Learning and Evaluation
Civil Society Engagement

DURATION

May 2009 to November 2010

MFF GRANT AMOUNT

US\$9,834

Objectives

The central goal of this project was to rehabilitate and conserve mangroves and coastal resources, consistent with Thailand's national strategy for managing and reversing coastal erosion. This would lead, it was hoped, to local action to ensure rehabilitation, a revival of local knowledge, and the creation of local sources of food for women's groups and the younger generation.

Background

The Phang Nga Bay Coastal Fishing Community Food Security Project was launched in 2000 by local developers and youth groups. The original aim of the project, which this small grant sought to build on, was to promote the participation of community-based organizations in managing coastal resources and building economic self-reliance.

Target beneficiaries

A total of 434 households from the villages of Ban Laemhin, Ban Ao Makham, Ban Khlong Khian and Ban Thonglarng in the vicinity of Phang Nga Bay National Park. The villagers here typically depend on small-scale fishing,

The Phang Nga Provincial Mangrove Learning Promotion Unit chose Ban Thonglarng as a pilot village for learning about and compiling data on local foods. The Mangrove Management Unit 22 in Phang Nga provided a patrol boat for mangrove surveillance.

The project used food security as an entry point for coastal ecosystem management in the communities living around Phang Nga

Bay. Local knowledge about food became the driving force for cooperation among different sectors at all administrative levels, including provincial and local government bodies.

Contributions to cross-cutting themes

Communications

Photos depicting activities by the project's youth group were shortlisted in the "Changing the World by Volunteering Hearts" photography contest and published in a local magazine, *Documentary*.

Gender equality

Women have always maintained and passed on their knowledge about the use of local plants as food and medicine. The project gave them an opportunity to transfer this knowledge to the younger generation. Mem-

bers of the youth group were keen to learn through hands-on experience.

Lessons learned

Support from local administrative organizations and responsible government agencies is important. Once communities joined forces to protect the mangroves, local authorities recognised the strength of local feeling and began lending their support.

Learning by doing is generally necessary to produce the best results, especially when building capacity and raising awareness.

Partners and their contribution

The participating communities made cash and in-kind contributions of US\$4,200 and US\$27,000 respectively. Mangrove Management Unit 22 at Takuathung, Phang Nga, contributed US\$667 in cash and a patrol boat for mangrove surveillance work.



Women mentoring youth on traditional foods found on mangrove mudflats, Phang Nga, Thailand © P. Parndam

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6.3 Raising awareness and promoting the use of local knowledge in managing coastal resources

Villagers and SGF management team at Koh Khiam, Phang Nga, Thailand © S. Sereepapowong



fishing. Average yearly incomes are around US\$2,000 per person.

Target beneficiaries

A total of 290 households from five target villages.

Outputs

- Establishment of a volunteer youth group to conserve coastal resources.
- An increase in community awareness. This allowed community members to articulate their environmental and livelihood concerns, and apply what they learned to:
 - preventing the expansion of shrimp farms in the area;
 - demarcating seven mangrove plots as community forests; and
 - establishing two village mangrove learning centres.

Accomplishments and challenges

Local authorities recognized a 200-hectare mangrove area in one village as a community forest. Community forests in the four other villages still await approval. The project reached out to other community networks in Phuket, Phang Nga and Krabi provinces, and ultimately plans to reach as far as Ranong province on the north Andaman coast.

The project successfully involved women's groups in its conservation activities. During these activities, women's leaders and members of youth groups displayed the results of their efforts to use local natural resources as substitutes for bought goods.

Challenges

The project was unable to reach out to every group in the community. As a result, some



LOCATION

Phang Nga Bay, Phang Nga, Thailand

PRIORITY POWS

Civil Society Engagement

DURATION

October 2009 to December 2010

MFF GRANT AMOUNT

US\$11,065

Objectives

This project aimed to contribute to the MFF strategies of building and encouraging the application of knowledge, and promoting improved environmental governance in coastal areas. Project activities consisted of building the capacity of local people by enhancing community learning and knowledge management.

Background

Koh Khiam is one of five target villages situated in the lower part of Phang Nga Bay. Like the other four villages, Koh Khiam lies between coconut and rubber plantations on its landward side and mangrove forests on its coastal side. The mangrove ecosystems fringing the target villages are drained and interlinked by four creeks. This area was once regarded as one of the richest coastal ecosystems in Thailand, with its extensive seagrass beds and coral reefs supporting a number of endangered aquatic species. In recent years its productivity and diversity have been degraded by development, prawn farming and other activities, but local people still earn their living mostly from small-scale

members were unaware of its activities. Where possible, extra efforts were made to communicate with these groups.

Some project activities called for a relatively large amount of time which busy villagers were often unable to give.

Contributions to cross-cutting themes

Gender equality and communications

Representatives of the women's group in each target village actively participated in events to present the products they were making with materials from their community forests. A photographic exhibition in the

village mangrove learning centres records these activities for visitors.

Lessons learned

Cooperation among various donors and agencies before launching projects is essential for smooth implementation and optimal results.

Partners and their contribution

Together, participating communities and the Restoration Project for Small-Scale Fishery in Andaman Coast made cash and in-kind contributions of US\$17,258 and US\$465 respectively.



Women and youth presenting local mangrove products, Phang Nga, Thailand © S. Sereepaowong

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6.4 Building a community network for managing mangroves and other coastal resources

Children planting mangroves, Phang Nga Bay, Thailand © P. Parndam



- Preparation of a clear networking action plan, including events to commemorate mangrove protection efforts on 14 February each year.
- Development of action plans with activities in mangrove rehabilitation, forest surveillance, zoning, and species regeneration.
- Involvement of youth groups for wider learning and networking.
- Empowerment of women's groups through strengthening and application of local knowledge on wild foods.
- Establishment of a community fund of US\$5,000 for use by 13 conservation groups in 18 different communities.
- Protection of about 480 hectares of mangroves, and planting of an additional 15,000 mangrove trees.



LOCATION

Phang Nga Bay, Phang Nga and Phuket, Thailand

PRIORITY POWS

Civil Society Engagement
Capacity Building
Community Resilience

DURATION

May 2009 to November 2010

MFF GRANT AMOUNT

US\$9,347

Objectives

This project aimed to rehabilitate and protect mangroves and coastal resources in Phang Nga Bay by engaging people from all sectors of society.

Background

The Phang Nga Bay Coastal Fishing Community Food Security Project was launched in 2000 by local developers and youth groups. Its original aim was to promote the participation of community-based organizations in managing coastal resources and strengthening their economic self-reliance. This small grant project sought to build on the achievements of the initiative.

Target beneficiaries

A total of 600 households from 19 communities, situated mostly in the middle part of Phang Nga Bay.

Outputs

- Creation of a coordinating network as a mechanism for managing mangroves and coastal resources.

- Establishment of a demonstration site for regenerating stocks of blue swimming crab (*Portunus pelagicus*).
- An increase in understanding of coastal resources management among residents of Phuket, with at least 5,000 people joining events organized by the network and 600 people applying for membership in the network.

Accomplishments and challenges

Thanks to the project the voices of communities were heard publicly in both Phuket and Phang Nga provinces. In several cases, communities were able to establish a communal forest conservation area in the face of unsuitable and destructive development projects. This success was attributable both to direct

community involvement and to the influence of good conservation practices.

Contributions to cross-cutting themes

Gender equality

The project sought to promote participation by men and women equally. Women's leaders were observed to be more open and more willing to talk about the conflicts or problems facing their communities.

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Lessons learned

Appropriately designed project activities can stimulate communities to take part in protecting coastal ecosystems.

Partners and their contribution

The participating communities made cash and in-kind contributions of US\$2,087 and US\$30,167 respectively. The Thai Health Promotion Foundation contributed US\$12,895 in cash.



Stakeholders listen to a network meeting, Phang Nga Bay, Thailand © S. Sriaram

6.5 Participatory rehabilitation and conservation of aquatic habitats at Mae Nang Khao

Patrolling the community conservation area, Kuraburi, Thailand © S. Serepaowong



government agencies aimed at encouraging local participation in conserving mangroves.

Target beneficiaries

One hundred households (out of 250) who earn their living from fishing and farming.

Outputs

- ▶ Releasing of over 11,000 juvenile fish in a protected mangrove area of 10 hectares.
- ▶ Reforestation of about 32 hectares of degraded forest with 9,000 mangrove plants.
- ▶ Reduction of destructive fishing methods in the project area.

Accomplishments and challenges

This project paved the way for close cooperation and mutual support between government agencies and project beneficiaries. The stakeholders affirmed the project's contribution to enhancing collective efforts focused on environmental conservation, an activity that the community values especially after the experience of the 2004 tsunami.

The project established regulations for communities to use and protect local mangroves collectively. A mangrove area of about 2,400 hectares was zoned as a habitat for juvenile fish and other aquatic animals. Another area of similar size was zoned as a community forest.

Challenges

The grantees identified poor weather conditions as a major cause of delay in project activities.

Contributions to cross-cutting themes

Communications

The project made efforts to keep communities informed about its activities by using



LOCATION

Ban Tung Rak, Mae Nang Khao, Kuraburi, Phang Nga, Thailand

PRIORITY POWS

Strategies for Management

DURATION

May 2009 to November 2010

MFF GRANT AMOUNT

US\$9,164

Objectives

This project aimed to use participatory approaches to involve communities in protecting, rehabilitating and planning the sustainable use of coastal resources.

Background

The village of Tung Rak is located in a mountainous forest area on Thailand's north Andaman coast, in the sub-district of Mae Nang Khao. After the 2004 Indian Ocean tsunami, displaced coastal families migrated into the village area and established new homes.

The nearby ecosystem of Mae Nang Khao mountain is under threat. This area covers about 3,520 hectares of national forest reserve land, lying unprotected outside the region's major national parks and wildlife sanctuaries. The major threats to the forests of Mae Nang Khao include clearing for cultivation, mainly of rubber and fruit trees, and illegal logging and hunting. Six other communities share this ecosystem.

The Mangrove Conservation Group of Mae Nang Khao was originally established in 2005 as the Mangrove Resources Management Group of Tung Rak, with support from

available communication facilities such as the village's public loudspeaker, and by organizing public village meetings.

Lessons learned

Participatory processes are an imperative for conserving the environment and natural resources.

Partners and their contribution

The participating communities made cash and in-kind contributions of US\$250 and US\$2,334 respectively.



Rhizophora stands reforested and managed by the community, Kuraburi, Thailand © S. Sereepaowong

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6.6 Restoring mangroves for *nak thale* (otters)

Signposting the otter sanctuary, Pa Klok, Thailand © P. Pamdam



Target beneficiaries

About half of the 956 households in the three target villages.

Outputs

- Establishment of a working group and youth network with detailed action plans to protect local otters and manage the mangroves in Ban Bangla.
- Collection of ideas and insights from community leaders on using otters as a strategic tool to involve the wider public in mangrove management.
- A doubling of the fish catch, evidence of improving mangrove productivity.
- Community-based management of 192 hectares of mangroves.
- Establishment of an alliance of 365 students and other residents of Phuket to protect mangroves.



LOCATION

Pa Klok, Phuket, Thailand

PRIORITY POWS

Knowledge for Management
Civil Society Engagement
Capacity Building

DURATION

May 2009 to November 2010

MFF GRANT AMOUNT

US\$9,404

Objectives

The objective of this project was to build community capacity to demarcate and manage conservation zones for local otter populations and a community mangrove area.

Background

The Phuket Women's Capacity Development Project was established in 1998 as an NGO supporting activities in coastal and urban communities in Phuket province. The Project aims to promote and manage campaigns on gender equality, self-sufficiency, and participation in managing coastal resources.

The Project secured a small grant from MFF to support its work to conserve and rehabilitate the remaining 192 hectares of mangrove forest at Khlong Tha Rua Mangrove Forest Reserve in Phuket by promoting participation with local community-based organisations. The small grant work focused on three villages in the vicinity of the Forest Reserve, Ban Phakcheed, Ban Yamu and Ban Bangla. The villagers in this area depend on goods and services from mangrove forests in Ban Bangla.

Accomplishments and challenges

The demarcation of a mangrove conservation area served as an incentive for community members to restore habitats for otters. It also served to protect the mangrove forest from further encroachment.

After the project ended, community leaders reported that eight otters had been spotted in the mangrove forest. The return of these otters to the area reflects the recovering state of the mangroves. Further, the community identified three new mudflats with large crab populations which they also attribute to recovery of the mangrove forest.

Project leaders plan to propose the middle island and Phakcheed Canal as additional conservation zones in the area. The canal serves as a transport channel out to sea. Once established as a conservation zone,

it would help to stop any encroachment on the mangroves by development projects or prawn farms.

The project will use its otter conservation strategy to link with other communities and agencies at all levels to promote replication and mainstreaming of its approaches. Women's and youth groups will play a major part in this effort.

The Learning Promotion Unit of Phuket Mangrove Resources Development Station selected Ban Bangla as a learning centre for indigenous knowledge about mangroves in Phuket province. Members of youth groups of various ages were invited to take part in community activities such as replanting and breeding of mangrove crabs.

According to community members, wastewater from neighbouring prawn farms has degraded water quality and harmed fish farming. The project shared its message about otter conservation with prawn farm owners, who expressed an interest in using the species as a focus for tourism.

Challenges

Project leaders had to work hard to build local people's understanding of the need for

conserving otters and other rare marine and coastal species.

Contributions to cross-cutting themes

Gender equality

The women's group of Ban Bangla played an important role in implementing project activities, not to mention their everyday family responsibilities. The group's participation is a reflection of its members' growing capacity to plan and manage the sustainable use of natural resources.

Lessons learned

Since otters are an indicator of the health of mangroves and coastal resources generally, communities see them as flagship species for conservation activities and a vehicle for promoting conservation messages in other areas.

Partners and their contribution

The participating communities and grantee made cash and in-kind contributions of US\$6,667 and US\$23,334 respectively. The Thai Health Promotion Foundation contributed US\$8,334 in cash.



Traditional launching of the otter project, Pa Klor, Thailand © P. Parndam

“Where urbanization is gradually spreading, a critical question is how a concerned public can check or control environmentally destructive development.”

— COMMUNITY MEMBERS

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6.7 Strengthening the capacity of a community network for managing Phuket's coastal resources

Ban Kuku community protected area, Phuket, Thailand © S. Sereepaowong



ecotourism. Yearly per capita income at the time of the project was about US\$2,334.

Outputs

- Management of 60 hectares of mangroves as a community forest, with technical support from the Phuket Mangrove Research Station.
- Planting and maintenance of 1,700 seedlings of different mangrove species.
- Conservation areas for seagrass and mangroves clearly demarcated, recorded on maps, and identified by 120 signboards posted in one community forest.
- Compilation of a database of mangrove flora and fauna. This helped communities to identify new food products and prepare plans for sustainable use and conservation of their resources.
- An increase in capacity evidenced by the communities' confidence and ability in formulating action plans, particularly a community network action plan and budget for 2011.
- Establishment of a fund to protect mangroves in one village by mobilising the community's own resources.



LOCATION

Muang and Thalang, Phuket, Thailand

PRIORITY POWS

Civil Society Engagement
Coastal Governance

DURATION

October 2009 to October 2010

MFF GRANT AMOUNT

US\$11,007

Objectives

The long-term goal of this small grant project was to support Thailand's national coastal resources policy. Its specific objective was to build the capacity and awareness of community groups and organizations for playing an effective part in formulating and implementing public policy for the conservation and sustainable use of marine and coastal resources.

Background

The Phuket Fisher-Folk Network was established in 2006 by members of a group of small-scale fishing communities. Its aim was to advocate against poorly formulated policies for fisheries and tourism which had led to mangrove encroachment and the degradation of marine resources.

Target beneficiaries

The project targeted fishing communities in four villages along Phuket's eastern coast. The main beneficiaries were 230 of the 4,878 households in these villages. Most of these households earn their living from small-scale fishing, agriculture, trade and services, and

Accomplishments and challenges

In Ban Tha La in Thalang district, project beneficiaries received additional support from several agencies. This helped to build and integrate different groups in the village, including small-scale fishers, a weavers' group, a food-processing group, and a tourism group. Project and other support also led to the demarcation of a marine protected zone in front of Ban Tha La.

In Ban Kuku in Muang district, 120 hectares of mangrove forest were brought under

community management, and another 10 hectares reclaimed successfully by the community through legal procedures.

Challenges

Despite the increased capacity of community leaders, the target villages still face a number of threats and concerns. At Ban Tha La, the issue is local infrastructure development, including a tourist programme and the construction of sea ports and a small private airfield. For Ban Kuku, near Phuket's provincial capital, the issues are land-use conflicts and related legal questions.

Contributions to cross-cutting themes

Communications

The project raised its profile through print

publications and by promoting its activities widely.

Lessons learned

The regular work commitments of beneficiaries can affect scheduling of project activities, as some participants are likely to be busy during the day. A number of meetings and workshops may have to be scheduled in the evening. Regular dialogue and coordination with different stakeholders help to facilitate implementation of project activities.

Partners and their contribution

The Andaman Project for Participatory Restoration of Natural Resources contributed US\$18,010 in cash. The participating communities made a total in-kind contribution of US\$12,367.



Community network meeting in Phuket, Thailand
© S. Sereepaowong

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6.8 Strengthening coastal livelihoods and community-based tourism

Grantee and UNDP management team at boat service dock, Phuket, Thailand © S. Sriaram



- ▶ Promotion of alternative occupations to protect coastal and marine ecosystems and resources.
- ▶ Establishment of a youth group called “Young Volunteers” to participate in project activities, such as promoting eco-tourism by developing appropriate tour equipment and manuals.
- ▶ Establishment of a waste bank in the village and along the beach, supported by the municipality.
- ▶ Planting of palm trees and mangroves near tourist sites.

Accomplishments and challenges

Project beneficiaries became more organized in designing eco-friendly tourist products, including a tourist boat facility where boating standards and regulations are displayed.

Challenges

The leadership of the youth group was interrupted during the project, resulting in limited participation by its members. Project meetings were difficult to organize because most participants had regular work or other business during the day. The project resolved this problem by holding meetings in the evenings.

Contributions to cross-cutting themes

Communications

The project increased its visibility by co-hosting an event on water transport safety with local small-scale tourist businesses.

Lessons learned

Gradually encouraging community members to meet and talk with different stakeholders, especially government agencies, helped to build local confidence and mutual trust.



LOCATION

Chalong Bay (from Cape Phanwa to Ban Bangkhonthi), Phuket, Thailand

PRIORITY POWS

Civil Society Engagement

DURATION

October 2009 to October 2010

MFF GRANT AMOUNT

US\$11,065

Objectives

This project aimed to strengthen the capacity of community members in designing environment friendly tourism activities, as well as to improve local environmental governance in coastal areas.

Background

Ban Bangkhonthi is a coastal community in Rawai, a sub-district of southern Phuket. Once an isolated fishing village, it now finds itself surrounded by growing urbanization with hotels, resorts and expensive housing. Most people in Ban Bangkhonthi earn a living from small-scale fishing and providing services for tourists.

Target beneficiaries

Twenty-five community members involved in small-scale fishing and earning supplementary income from tourism.

Outputs

- ▶ Improved capacity of communities to develop secure livelihoods through environmentally friendly tourism activities.

Partners and their contribution

The Green Fins Association made a cash contribution of US\$6,174, and together with the participating community made an in-kind contribution valued at US\$3,067. The Phuket Marine Biological Centre made an in-kind contribution valued at US\$2,966.

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Local youth training, Phuket, Thailand © K. Kosawisuthi

6.9 Mangroves for the future

Community water treatment facility, Phuket, Thailand © S. Serepaowong



and now manages 48 of the 290 hectares of remaining mangrove forest in Phuket. Community members have also established a savings project.

Pu Darm, the second target community, is situated at the northern end of Phuket.

Target beneficiaries

A total of 225 households in Kingkaew Soi 1 and 16 households in Pu Darm.

Outputs

- Launching of capacity-building programmes on community waste management, coastal resource management and demarcating mangrove areas for reforestation and conservation.
- In Pu Darm, installation of a community-wide filtration system for reducing excessive nutrient run-off in wastewater from households.
- Capacity of community members built for managing the wastewater filtration system, reducing run-off into the 100-hectare mangrove area next to the village.
- Establishment of links between target communities and other communities who had heard about and wanted to learn more about the project.



LOCATION

Kingkaew Soi 1 and Pu Darm, Phuket, Thailand

PRIORITY POWS

Civil Society Engagement
Sustainable Livelihoods

DURATION

October 2009 to December 2010

MFF GRANT AMOUNT

US\$10,860

Objectives

The primary aim of this project was to support community organizing processes that address local environment and development issues, including conserving natural resources.

Background

Kingkaew Soi 1 is a semi-urban community of about 385 households. Its residents pursue various occupations, ranging from providing general and professional services to running small businesses and fishing. As a new community with a diverse background, it still lacks appropriate infrastructure. An estimated 40% of residents still depend on local mangrove forests for fishing and other daily needs.

In 2007, members of the community launched a network with over 30 similar communities around Phuket to rehabilitate degraded mangroves. They received support from the Community Organization Development Institute, a public agency, and the government's Mangrove Development Station 23 in Phuket. The network has carried out various projects similar to the current one,

Accomplishments and challenges

At Kingkaew, 48 hectares of mangroves were officially demarcated and managed as a community forest, and a plan prepared for their management. Within this forest, a small communal plot of the medicinal plant sea holly (*Acanthus ebracteatus*) has been protected.

Pu Darm community has received many visitors, both Thai and foreign, wanting to learn about its innovative wastewater treatment system. The system has now been

shared with communities in neighbouring countries such as Myanmar.

Contributions to cross-cutting themes

Communications

The development and outcomes of project activities were documented on community bulletin boards and posters.

Lessons learned

Project capacity-building activities, both by the network itself and by MFF, were useful as they were able to promote more systematic learning among network leaders.

Efforts are needed to strengthen mutual understanding between targeted communi-

ties and responsible government agencies. The project was able to create community-government links, and also attracted research institutes and other interested organizations to its sites.

Lastly the impact of project activities can be enhanced by linking them to other issues in the community. In this case, the project was successful in building links to activities aimed at resolving land-use conflicts.

Partners and their contribution

The Chumchonchai Foundation and Community Organization Development Institute together contributed US\$6,667 in cash. The participating communities made an in-kind contribution valued at US\$5,000.



Close up of water treatment facility, Phuket, Thailand
© S. Sereepaowong

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6.10 Planting *Pandanus* palm to protect mangroves

Peeling *Pandanus* leaves for processing, Krabi, Thailand © S. Sereenpaowong



group has reached out to 11 villages in the area. Through regular conservation and sustainable use activities, one of the villages was recognized by Krabi province as a model village for environmental conservation in 2008.

Target beneficiaries

People in 188 households earning a living from working on rubber and oil palm plantations, small-scale fishing, and trade and services.

Outputs

- Organisation and facilitation of a community forum for 90 stakeholders to introduce the project's objectives and approaches, and to gain support and agreement from local landowners and government officials.
- Establishment of a no-encroachment boundary line extending about three kilometres across local mangroves and marked on large-scale maps.
- Planting of 2,700 *Pandanus* plants (with an 80% survival rate) along the boundary line to protect about one hectare of mangroves.

Objectives

This project had three specific objectives:

- 1 to demarcate a "no encroachment" area of mangroves;
- 2 to ensure sufficient *Pandanus* supplies to support weaving and handicrafts production aimed at increasing community incomes; and
- 3 to increase conservation awareness and capacity among youth groups and community members.

Background

The area around Ban Khlong Yang in Koh Lanta district of Krabi province is predominantly flat land, suitable for rubber and oil palm plantations. The coastal ecosystem is a combination of wet forest and mangroves.

The Coordinating Centre of the Conservation Network for Mangrove Protection was established in 2005 by village volunteers from three villages. The Network aims to protect local marine and coastal resources. To scale up conservation activities, the volunteer

Accomplishments and challenges

Community leaders, government officers and landowners came to a mutual understanding regarding the use of marginal land to be planted with *Pandanus*.

Demarcating the mangrove area indirectly helped to reduce water pollution and improve the condition of the mangroves.

Community members now have an adequate supply of *Pandanus* for use in weaving and handicrafts, and as a result have started to gain some supplementary income.

Lastly, local youth group members have a better understanding of the value of conserving mangroves and coastal resources.



LOCATION

Ban Khlong Yang, Koh Lanta, Krabi, Thailand

PRIORITY POWS

Economic Valuation
Sustainable Livelihoods
Sustainable Business Practices

DURATION

May 2009 to November 2010

MFF GRANT AMOUNT

US\$9,696

Challenges

Unclear boundaries between private land and public mangrove areas were a challenge. Because of disputed boundaries, several landowners did not allow any *Pandanus* planting. The project organized negotiations with these landowners in open fora that included women and youth groups. These were successful in several cases, allowing the project to plant *Pandanus* on private land.

Contributions to cross-cutting themes

Gender equality

The local Pandanus Weaver Women's Group took the lead in the project's handicraft support activity.

Lessons learned

The Pandanus Weaver Women's Group managed to generate some income from the products they sold, as well as pass on their knowledge to youth groups in the community

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school. Members of the group demonstrated their skills in weaving with enthusiasm, even though it is a time-consuming activity. Producing a mat of two square metres takes about 10 days, for example. However, the returns are thought to be worth the effort, particularly as prices are strong. The current price of dyed *Pandanus* fibre is about US\$13–17 per kg.

Project beneficiaries will continue to monitor and prevent any encroachment in the reforested *Pandanus* areas, promote supplementary income generation, especially through weavers' groups, and teach local knowledge about *Pandanus* weaving in community schools to instil conservation awareness in younger generations.

Partners and their contribution

The participating communities made an in-kind contribution valued at US\$10,750, and the Khlong Yang Sub-district Administrative Organization contributed US\$734 in cash.



Pandanus leaf products, Krabi, Thailand © P. Thongkhong

“The community set up a good example for conservation. It is difficult to see how this project could be replicated or scaled up successfully within a few years, unless there is practical policy support and systematic enforcement.”

— MR PHISIT THONGKHONG
PROJECT MANAGER

6.11 Rehabilitating mangroves and beach forests at Khlong Prasong

Patrolling the beach forest rehabilitation site, Khlong Prasong, Thailand © S. Sereapawong



community conflict caused by competition between tourism businesses.

Target beneficiaries

The project targeted 5,373 people from 903 families on Khlong Prasong, 98% of whom are Muslim and have a yearly income of about US\$834. Direct beneficiaries were drawn from 100 families earning a living from farming and small-scale fishing, and 120 dependent on fishing and mangrove forests.

Outputs

- Capacity increased for conserving marine and coastal resources, as observed from the community's ability to formulate strategies and collaborate with other major stakeholders.
- Production of 500 booklets to promote conservation awareness among youth and community groups in Koh Klang.
- Planting of 700 mangrove seedlings with community support along Khlong Talu.
- Planting by the community of a further 13,000 mangrove seedlings on deserted prawn farms covering about four hectares.



LOCATION

Khlong Prasong, Krabi, Thailand

PRIORITY POWS

Coastal Governance
Marine Protected Areas
Sustainable Business Practices

DURATION

October 2009 to October 2010

MFF GRANT AMOUNT

US\$10,156

Objectives

This project aimed to increase community capacity in marine and coastal resource conservation; to build community awareness and knowledge about mangroves and beach forest rehabilitation; and to undertake rehabilitation activities in Koh Klang and Khlong Talu. Its long-term objective was to build knowledge and awareness for the sustainable use of coastal resources in Krabi estuary.

Background

Koh Klang is a village on the small island of Khlong Prasong, 10 km offshore from Krabi town. Covering 1,120 hectares and surrounded by mangroves, the inner area of Khlong Prasong is used for cultivation. Its largely Muslim population subsists on small-scale fishing, rice growing, prawn culture and servicing tourists. Erosion is a noticeable problem on the island's coastline.

The Environmental Conservation Group of Koh Klang is a local NGO established with support from the Bank for Agriculture and Agricultural Cooperatives in Krabi. Since 2001 the Group has worked to reduce

Accomplishments and challenges

The community contributed to protecting an islet of mangroves adjacent to Koh Klang. The project also allowed the community to continue managing the "Pa Khlong Lad Yao", or Lad Yao Canal Forest, established in 2006 by a UNDP small grant project to promote tropical forests.

Challenges

The propagation and replanting of mangrove plants was affected by dry weather, and constant rains and storms damaged the replanted seedlings.

Contributions to cross-cutting themes

Communications

The project raised its profile through an international youth camp, the Wetlands School Network Exchange Event, held in December 2009. At this event, students from China, Japan, Korea, Malaysia and Thailand joined in project activities and planted mangroves.

The project was also featured in a local magazine, *Lueang Krabi*, published by the Krabi Provincial Administrative Organization. Some of the articles on the project were republished on the website of Wetlands International Thailand.

Climate change

People in some communities on Khlong Prasong piloted a climate change adaptation strategy whereby bamboo piling and concrete drainage pipes are laid along the coast to reduce the force of large waves.

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Lessons learned

Appropriate project timing is important. At certain times of the year (particularly November to February) local people are too busy fishing or farming to play a full part in project activities.

Planting sites must be selected carefully. In some project areas, there was not enough water for planting mangroves between November and April.

The number of seedlings prepared for replanting proved to be insufficient. However, the government's Mangrove Resources Development Station 26 at Krabi kindly donated enough seedlings to make up the shortfall.

Partners and their contribution

The Environmental Conservation Group of Koh Klang made cash and in-kind contributions of US\$2,834 and US\$2,834 respectively.



Waste recycling in the community, Khlong Prasong, Thailand © S. Sereepaowong

6.12 Building community capacity for managing coastal resources at Talingchan

Woman making *N. fruticans* thatch, Talingchan, Thailand © S. Sereepaowong



families earning their living from small-scale fishing were direct beneficiaries.

Outputs

- Increased income from supplementary livelihood activities such as raising mushrooms and black crabs.
- Recognition from the provincial fishery office.
- Establishment of a community economic area in mangroves covering about nine hectares.

Accomplishments and challenges

Although land ownership in some areas is unclear, several forest plots have been demarcated as public mangrove areas. The project reforested those plots which had clear boundaries.

The project also promoted the culture of black crabs, grouper and mushrooms, and the use of the palm *Nypa fruticans*.

As there is no officially recognised land ownership in the area, the project had to carry out its activities discreetly. Despite this, project leaders report that the communities achieved the project's goal, successfully building their capacity for managing coastal resources. The community mobilized itself to demarcate mangroves against encroachment, and was quite successful in keeping out encroachers.

Challenges

The project suffered from limited cooperation among public agencies and a lack of data and information. Some issues were too complex for communities to address alone. Dealing with land tenure, for example, is a major challenge, especially when the com-



LOCATION

Talingchan, Krabi, Thailand

PRIORITY POWS

Knowledge for Management
Strategies for Management
Civil Society Engagement

DURATION

October 2009 to October 2010

MFF GRANT AMOUNT

US\$8,805

Objectives

This project sought to encourage participatory processes of rehabilitating, conserving and managing natural resources which will lead to increased capacity of communities, more secure livelihoods, and the sustainable management of coastal resources.

Background

The sub-district of Talingchan covers 24 km² to the east of the Krabi River estuary, a Ramsar Wetland of International Importance. There are six villages in the sub-district, the majority of whose residents are Muslim and earn a living from fishing and farming. Large parts of this area have been converted into prawn farms, some of which have been deserted.

Target beneficiaries

The project's target population was over 5,000 people from 1,020 families with a yearly income of about US\$667 per person from fishing, farming and other activities. Sixty

munity has already identified several plots of land as public mangrove forest.

Contributions to cross-cutting themes

Communications

The project increased its visibility and understanding among local people through the use

of community radio, community signboards and other village facilities, as well as community discussion groups.

Lessons learned

Limited cooperation from relevant government agencies can hinder project implementation.

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Stands of *N. fruticans* protected by the community, Talingchan, Thailand © S. Sereepaowong

6.13 Collective rehabilitation and conservation of mangroves at Ban Don Bay

Conserving mangroves in Ban Don Bay, Thailand © S. Sereepapawong



mainly with donations from community members, and has also cooperated with NGOs and other development projects.

Target beneficiaries

About half of the 2,890 households in the project area, most of whom earn their living from small-scale fishing or depend on other coastal resources for their livelihoods.

Outputs

- Capacity built within the target population and networks established to monitor environmental conditions across the project area.
- Demarcation of a conservation area for protection and natural regeneration to prevent illegal fishing.
- Capacity built to conduct local resource inventories.
- Production and distribution of a set of educational reference materials about mangroves and threatened flora and fauna in Ban Don Bay.



LOCATION

Ban Don Bay, Surat Thani, Thailand

PRIORITY POWS

Sustainable Livelihoods
Community Resilience
Integrated Coastal Planning

DURATION

May 2009 to November 2010

MFF GRANT AMOUNT

US\$9,722

Objectives

This project aimed to rehabilitate and protect local coastal resources. It set a target of a 20% increase in mangrove cover in its focal area, to be achieved in an integrated manner at village, district and provincial levels.

Background

Ban Don Bay is an integrated marine and coastal ecosystem on the southern Gulf of Thailand, extending about 120 km. Once rated one of the most biodiverse areas in the Gulf of Thailand, with habitats such as mangroves, seagrass beds and coral reefs, it has now been badly degraded by aquaculture, destructive fishing, pollution, conflict among resource users and a lack of intersectoral cooperation. The bay was designated a Ramsar Wetland of International Importance in 2000.

The Ban Don Bay Conservation Network was established 30 years ago by local people who were experiencing the negative impacts of environmental degradation and wanted to take collective action to address it. The Network has financed its conservation activities

Accomplishments and challenges

Members of community-based organizations and their leaders developed technical and managerial skills. A number of community members were elected as heads of sub-district administrative organizations. These organizations provided additional co-financing to support project activities.

Community organizations demarcated and managed a conservation zone in the sub-districts of Khao Than and Tha Chang.

Participating sub-district administrative organizations updated their data and other information on local socio-economic indicators for future reference and use by officials and households in the project area.

The project brought together several national partners and local government authorities to participate in strengthening conservation efforts, launched community-based research on coastal resource conservation and ecotourism, and promoted sustainable livelihood activities.

Challenges

Competition among community groups delayed funding and complicated financial arrangements. The project committee resolved this issue by setting up a strict auditing system.

Conflict between communities and private businesses in Khlong Chanark sub-district made demarcation of a conservation zone there difficult. The network coordinated with relevant government agencies, local administrative organizations and NGOs to resolve this conflict.

Contributions to cross-cutting themes

Communications

A media spot on the Ban Don Bay Network was featured by the local newspaper, radio station and television network. This focused on a community meeting with the governor of Surat Thani to express local people's gratitude for a new patrol boat and sets of network surveillance equipment donated by the province.

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A website, www.tnewsnetwork.com, featured a "Public Forum on Ban Don Bay Coastal Resources Management" on 28 July 2009. Another website, www.suratnews.com, featured visits to the project area by NGOs and a group of Japanese students on 1 September 2009.

Lessons learned

With coastal and marine ecosystems better protected and more productive, members of the Network feel confident they can set up a rotating fund to finance livelihood activities and a savings group to assist members. The two funds will be managed by network members and are expected to be self-financing.

Currently the Network is reaching out to younger people to promote a more harmonious and collaborative, as opposed to adversarial, approach to conservation.

Partners and their contribution

Community-based organisations made cash and in-kind contributions worth US\$1,200 and US\$14,720 respectively. Local administrative organizations made in-kind contributions valued at US\$300 in total. The Surat Thani Provincial Public Health Office contributed US\$12,600 in cash, and the Office of the Governor of Surat Thani contributed a patrol boat and surveillance equipment worth US\$16,667.



Demarcating a mangrove protection zone, Ban Don Bay, Thailand © Ban Don Bay Conservation Network

6.14 Rehabilitating and conserving habitats for clams

Ciam habitat in Siab Yuan, Thailand © S. Serepaowong



ment's Mangrove Resources Development Station 12 at Chumphon. Initially comprising 80 members, the group has launched various efforts to rehabilitate degraded mangroves and deserted prawn farms in the area. The group also organizes clean-up activities after monsoon storms.

Target beneficiaries

Forty of 79 households in Siab Yuan who practise small-scale fishing and aquaculture.

Outputs

- ▶ Establishment of a 2-km mangrove reforestation zone along the coast.
- ▶ Establishment of a 5.5-hectare community aquaculture zone.
- ▶ Establishment of a conservation zone for razor clams (*Solen* spp.).
- ▶ Planting of about 10,000 mangroves along the coast.
- ▶ Adoption of community regulations to protect seagrass and clam conservation zones.
- ▶ Demarcation of 16 hectares of mangroves as a rehabilitation zone.



LOCATION

Siab Yuan, Chumphon, Thailand

PRIORITY POWS

Capacity Building
Sustainable Livelihoods

DURATION

May 2009 to November 2010

MFF GRANT AMOUNT

US\$9,980

Objectives

The main objective of this project was to rehabilitate mangroves for sustainable use and supplementary local income.

Background

Siab Yuan is a small fishing village situated on the coast of Thunkha-Sawi Bay near Mu Koh Chumphon Marine National Park. Because of its location and natural sedimentation, this park used to be one of the richest for marine species, especially clams, on the western coast of the Gulf of Thailand. Poor planning, however, together with upland cultivation, has resulted in a dwindling clam population.

Most of the families who participated in the project make their living from small-scale fishing and aquaculture, as well as some limited cultivation of rubber and oil palm on small hillside plots. Cultivation of these plots has caused noticeable soil erosion, stimulating community members to explore a ridge-to-reef conservation approach.

The Sea and Coastal Resources Protection Volunteer Group of Siab Yuan was formed in 2007 with help from the govern-

Accomplishments and challenges

In an area of the bay near the shore, the community set out bamboo stakes demarcating a zone for raising clams. The community also developed regulations to protect this zone.

About 16 hectares of mangroves were demarcated as a rehabilitation zone and have been under constant community protection.

Challenges

Severe monsoon storms devastated the clam raising zone.

Contributions to cross-cutting themes

Climate change

The community sees mangrove reforestation as a strategy to lessen the effect of severe storms that may be linked to future climate change.

Lessons learned

Maintaining a positive community spirit by

providing mutual support is vital for the successful implementation of project activities.

Partners and their contribution

In-kind contributions were made by the community (US\$28,480), Mangrove Resources Development Station 12 (US\$100), and Darnsawi sub-district administrative organization (US\$34). The Petroleum Authority of Thailand took part in mangrove planting.



Clams from the community conservation area, Siab Yuan, Thailand © S. Sereepaowong

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6.15 Strengthening conservation of mangroves and other marine and coastal resources at Thong Toam Yai Bay

Mr Watcharin Sawangkan with mangrove seedlings, Thong Toam Yai, Thailand © S. Sereepaowong



LOCATION

Thong Toam Yai, Chumphon, Thailand

PRIORITY POWS

Knowledge for Management
Strategies for Management
Civil Society Engagement

DURATION

October 2009 to October 2010

MFF GRANT AMOUNT

US\$9,979

Objectives

The long-term goal of this project was to rehabilitate and conserve coastal resources. Its specific objectives were to reforest mangrove areas and establish a conservation area for fish. This was to be achieved by integrating coastal resource management issues into community livelihood activities and into a community development plan.

Background

Thong Toam Yai is a small coastal community, members of which depend heavily on the marine and coastal resources of Thong Toam Yai Bay. Most are engaged in small-scale fishing and aquaculture, or work on rubber and oil palm plantations. Nine families in the village have started ecotourism activities and homestay ventures.

Target beneficiaries

The main beneficiaries were 203 households at Thong Toam Yai with a yearly income of

about US\$2,000–2,667 per person from small-scale fishing.

Outputs

- ▶ Planting of mangrove seedlings on deserted prawn farms covering about four hectares.
- ▶ Training for 35 members of a youth group and 30 members of the community on the “Revival of Thong Toam Bay”.
- ▶ Launching of activities to collect and dispose of waste, reforest mangrove areas and collaborate with surrounding communities on conservation activities.
- ▶ Establishment of a clearly demarcated fish refuge.
- ▶ Compilation of a plant species database for use in future conservation activities.

Accomplishments and challenges

Members of the project took part in a National Symposium on Climate Change Adaption and Disaster Preparedness in December 2010. Thong Toam Yai won first prize in the UNDP GEF-led search for the best community project to adapt to climate change. The award recognised the community’s innovative “eco-friendly tourism” which integrates climate-change-sensitive strategies. Mr Watcharin Sawangkan, the project coordinator, presented the history of conservation efforts in the area and accepted the award on behalf of the community.

As a result of winning this award, the project received national recognition for its community-led efforts and US\$10,000 in additional support.

Contributions to cross-cutting themes

Climate change

Integrating climate-change-sensitive strategies into project activities proved of major benefit for the community.

Lessons learned

Artificial reefs made of degradable materials

may last only one year. More durable materials would last longer but are more costly to transport and sink.

Partners and their contribution:

Community members made an in-kind contribution valued at US\$13,894. The Darnsawi sub-district administrative organisation contributed US\$967 in cash.



Avicennia seedling at Thong Toam Yai Bay mangrove nursery, Thailand © S. Sereepaowong

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Mangroves for the Future

INVESTING IN COASTAL ECOSYSTEMS

Mangroves for the Future (MFF) is a partnership-based initiative promoting investments in coastal ecosystems that support sustainable development. MFF provides a collaborative platform for the many countries, sectors and agencies tackling the challenges to coastal ecosystem conservation and livelihood sustainability, and is helping them to work towards a common goal.

MFF builds on a history of coastal management efforts before and after the 2004 Indian Ocean tsunami, especially the call to sustain the momentum and partnerships generated by the immediate post-tsunami response. After focusing initially on the countries worst-affected by the tsunami – India, Indonesia, Maldives, Seychelles, Sri Lanka and Thailand – MFF has now expanded to include Pakistan and Viet Nam. MFF will also continue to reach out to other countries in the region facing similar challenges, with the overall aim of promoting an integrated, ocean-wide approach to coastal area management.

MFF seeks to achieve demonstrable results through regional cooperation, national programme support, private sector engagement and community action. This is being realized through concerted actions and projects to generate and share knowledge more effectively, empower institutions and communities, and enhance the governance of coastal ecosystems.

Although MFF has chosen mangroves as its flagship ecosystem, the initiative embraces all coastal ecosystems, including coral reefs, estuaries, lagoons, wetlands, beaches and seagrass beds. Its management strategy is based on specific national and regional needs for long-term sustainable management of coastal ecosystems. These priorities, as well as newly emerging issues, are reviewed regularly by the MFF Regional Steering Committee to ensure that MFF continues to be a highly relevant and responsive initiative.

Learn more at: www.mangrovesforthefuture.org

