Mangroves for the Future
INVESTING IN COASTAL ECOSYSTEMS

# For the People, By the People

## Results and Lessons from a Small Grants Programme

Ranjith Mahindapala and Kumudini Ekaratne

IUCN Sri Lanka Country Office

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IUCN, the International Union for Conservation of Nature, helps the world find pragmatic solutions to our most pressing environment and development challenges. It supports scientific research, manages field projects all over the world and brings governments, non-government organizations, United Nations agencies, companies and local communities together to develop and implement policy, laws and best practice.

IUCN is the world's oldest and largest global environmental network – a democratic membership union with more than 1,000 government and NGO member organizations, and 10,000 volunteer scientists in more than 160 countries.

IUCN's work is supported by more than 1,000 professional staff in 60 offices and hundreds of partners in public, NGO and private sectors around the world. The Union's headquarters are located in Gland, near Geneva, Switzerland. Its Asia Regional Office is based in Bangkok, Thailand.

The IUCN in Sri Lanka was established in 1986 and is guided by IUCN's mission and the environmental concerns embodied in successive National Environmental Action Plans of the Government of Sri Lanka.

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Restored vilage tank (Kumudini Ekaratne)

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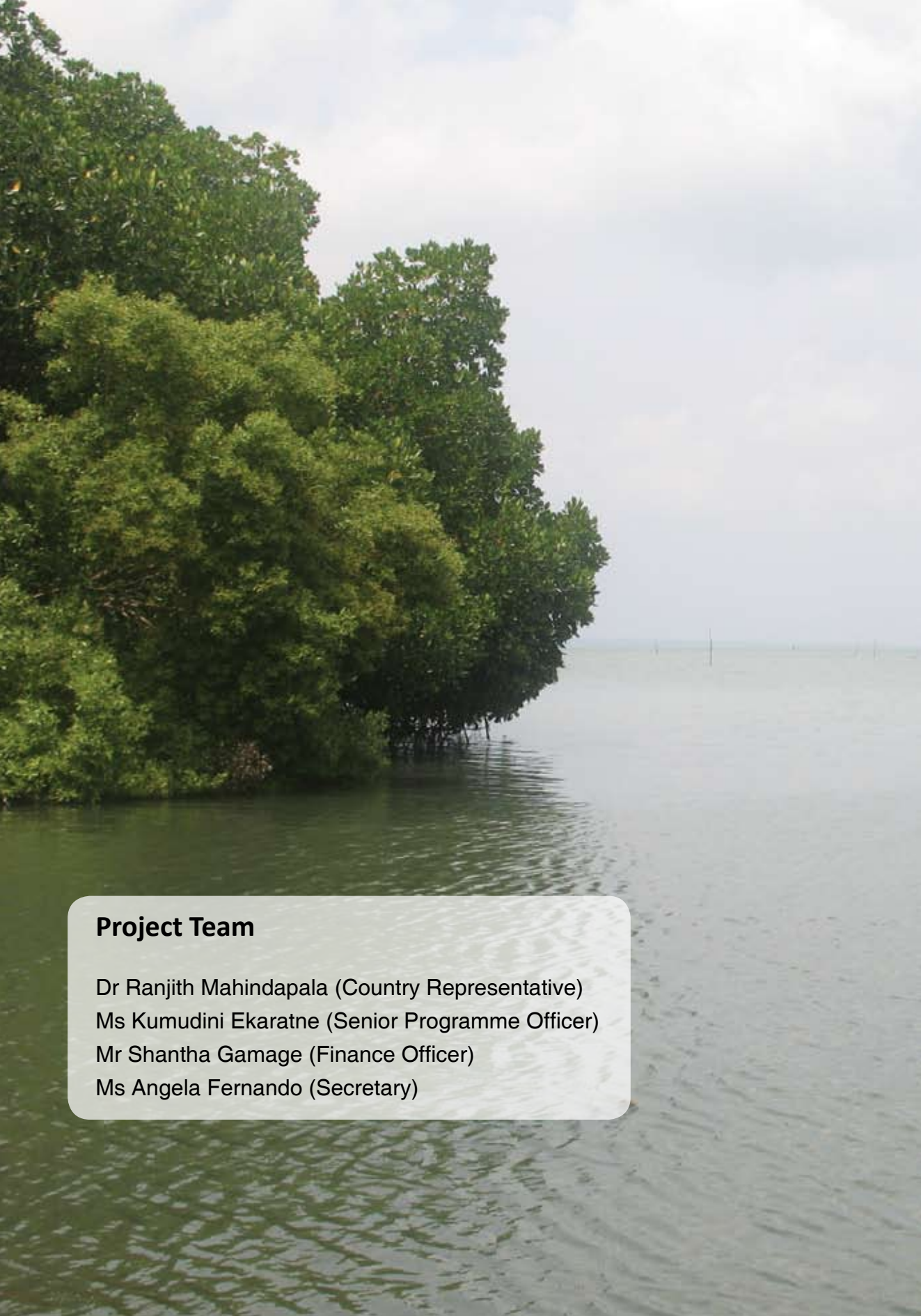
# Contents

# Preface

This booklet documents the achievements of selected projects of the Mangroves for the Future (MFF) Small Grants Programme in Sri Lanka, with emphasis on drawing lessons to improve future project performance. The projects are presented under three thematic areas, namely Ecosystem restoration, Education and Awareness, and Livelihood enhancement. The contents are largely based on information gleaned from project progress reports and reviews, and notes of field monitoring visits. The discussions at the Lessons Learned workshops enriched the contents significantly. All projects were not as successful as we had hoped for. Nonetheless, they provided useful lessons on conducting small projects with communities, non-government organizations (NGOs), private sector and quasi-government institutions. And many projects showed us how small sums of money could be utilized to produce significant local level results, which are replicable.

IUCN Sri Lanka wishes to acknowledge the assistance of the grantees in compiling this booklet. We also wish to record our appreciation to Dr Tilak Wettasinghe for editing this publication.



## Project Team

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Mr Shantha Gamage (Finance Officer)
Ms Angela Fernando (Secretary)

# 1. Introduction

## 1.1 Mangroves for the Future Programme

Mangroves for the Future (MFF) is a regional programme that aims to strengthen the environmental sustainability of coastal development, and promote investment of funds and other resources in coastal ecosystem management for sustainable development. MFF seeks to achieve demonstrable changes and results across four key areas of influence: regional cooperation, national programme support, private sector engagement, and community action to build knowledge, strengthen empowerment and enhance good governance, in coastal areas. MFF targets six 'focal countries', which were the most affected by the Indian Ocean tsunami (India, Indonesia, Maldives, Seychelles, Sri Lanka, and Thailand)[1]. However, several other countries also participate as 'dialogue countries'; currently Bangladesh, Kenya and Tanzania. While mangroves are regarded as the flagship species, MFF addresses all coastal ecosystems.

MFF was initiated in 2006 by IUCN, the International Union for Conservation of Nature and Natural Resources, and the United Nations Development Programme, UNDP. It has grown to include other UN agencies, such as the UN Food and Agriculture Organization (FAO) and the United Nations Environment Programme (UNEP), as well as CARE International and Wetlands International (WI). The programme was launched officially in December 2006, in a small coastal village outside Phuket, Thailand, by President Bill Clinton in his capacity as UN Special Envoy for Tsunami Recovery.

The programmes are implemented through/or in partnership with national governments, UN agencies, NGOs, etc. Integration, knowledge sharing, and synergy between components are achieved through a Regional Steering Committee (RSC) and National Coordinating Bodies (NCBs). The RSC provides overall direction and guidance to the programme and the NCB provides national level direction and coordination.

MFF has two categories of project funding, a Small Grants Programme and funding for large projects. In Sri Lanka, the Small Grants Programme was in operation from December 2008 to December 2009, and this booklet documents the results achieved.

1 The geographical coverage of MFF has been expanded with effect from February 2010 to include Pakistan and Vietnam.

## 1.2 MFF Small Grants Programme

The MFF Small Grants Programme (SGP) is a window for financing sustainable local level initiatives in the coastal areas, through small grants. It is administered by the MFF Secretariat in accordance with the decisions made by the MFF Regional Steering Committee. In Sri Lanka, SGP is managed by IUCN Sri Lanka Office (IUCN SL) in keeping with the directions of the MFF National Coordinating Body (NCB), which oversees the selection process and project implementation. The objectives of the SGP are to support activities that contribute towards conservation and restoration of coastal ecosystems as an essential part of the coastal development infrastructure. SGP strives to achieve its objectives through community involvement.

## 1.3 Managing the programme

The Guidelines for the Small Grants Programme in Sri Lanka (SGP Guidelines) were prepared by IUCN Sri Lanka and approved by the NCB at its meeting held on10 April, 2008. The salient features of the Guidelines are:

- Provision for quick disbursement of funds to NGOs, CBOs and other approved organisations in an effective and efficient manner.
- Provision for transparent and accountable operations in line with donor requirements and the governance structure and partnership arrangements specified for MFF.
- Provision for technical support to project applicants and project grantees and facilitate exchange of information, field experiences and best practices.
- Provision for implementing efficient monitoring and evaluation procedures.
- Provision for regular and timely reporting on progress of the small grants project portfolio to RSC (via the MFF Secretariat).

Criteria to assess the eligibility of proponents were developed by the NCB. NCB required proponents to be national/local NGOs, CBOs, academic and scientific institutions or small scale businesses and enterprises. They should be registered with an appropriate institution, preferably for two years, and meet most of the following criteria:

- Capacity to implement community-based projects in the fields of coastal rehabilitation, conservation and/or sustainable use of natural resources.

- Contributions to community development.
- Scientific or professional credibility (determined by peer review).
- Experience in project management and financial administration.

The NCB decided that the SGP will mainly support activities in the following areas:

- Community-based coastal rehabilitation.
- Building local capacity.
- Public awareness on environmental issues.
- Disaster risk reduction from floods, droughts, epidemics, sea waves and tsunamis.
- Livelihoods, incomes, and equality and gender concerns.
- Activities with potential for replication or scaling-up, and attracting co-financing.
- Activities with potential to create an impact on policy at the National/ Provincial/District/Divisional level.

***Geographic Areas for Implementation of the Small Grants Programme***

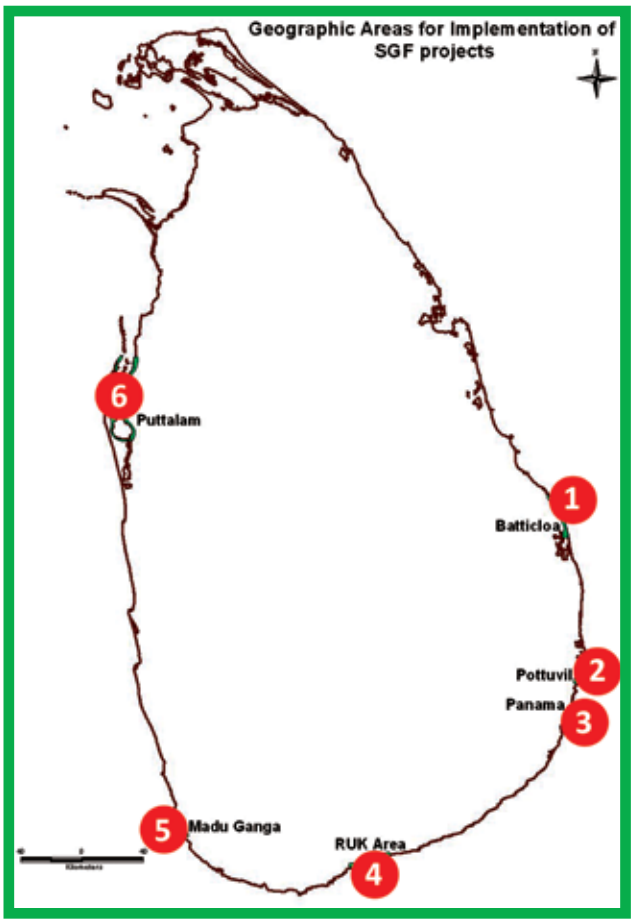
The NCB also decided to restrict the Small Grants Programme, at least initially, to selected critical coastal areas and appointed a sub-committee to examine the geographic options. The sub-committee identified 21 possible geographic areas, and used the following criteria to prioritise them:

| | |
|---|---|
| Ecological aspects | richness, biodiversity, representativeness, ecological integrity, uniqueness/dependency, presence of endemic and endangered species |
| Use of resources | economic significance of resources, conflicts, impacts of fisheries, tourism etc. on ecosystems |
| Incidence of poverty | poverty levels, livelihoods, dependency, relationship between poverty and environment, access to alternative employment etc. |
| Environmental services and products | scenic beauty, cultural and historic values |
| Sustainability/ Continuity | availability and capacity of CBOs/NGOs; willingness of communities to participate in management |

The sub-committee, using these criteria, their field knowledge and value judgment, recommended the following geographic areas (not in order of priority) for SGP interventions (Figure 1):

- Puttalam lagoon
- Maduganga
- Rekawa-Ussangoda-Kalametiya and associated areas
- Panama
- Pottuvil
- Batticaloa

The NCB at its meeting held on 23 May, 2008 approved the recommendation of the sub-committee. NCB also decided to consider the following sites at a later stage: Chilaw, Hikkaduwa National Park, Unawatuna Bay, Mawella and Passikudah/Kalkudah.




1. Batticaloa
2. Pottuvil
3. Panama
4. Rekawa-Ussangoda-Kalametiya and associated areas
5. Maduganga
6. Puttalam lagoon

**Fig. 1 – Geographical areas selected for SGP interventions**

### *Limits for Small Grants Programme*

The NCB limited the project duration to 12 months and funding to LKR 500,000 (about USD 5,000), in the first instance. NCB was convinced that a great deal could be accomplished, at the community level, within these limits and expected the restrictions to preferentially encourage the participation of locally-based NGOs and CBOs. Nevertheless, two Colombo-based large NGOs also applied for grants, indicating their active involvement in local level activities.

### *Call for project proposals*

In order to ensure transparency in the selection of grantees, the NCB decided to give maximum publicity to the programme. Accordingly, the following procedure was adopted:

- Advertisements calling for project proposals were placed in the English, Sinhala and Tamil newspapers, from 15 to 18 August, 2008.
- The advertisement was displayed on public notice boards in various government and non-government agencies, in the selected geographic areas.
- The advertisement was displayed in IUCN project offices in Puttalam and Thirukkovil.
- Relevant programme information was shared with the network of IUCN's previous and current small grantees.

In order to facilitate the application process, the SGP Guidelines and a format for proposals were provided to the interested parties. The deadline for receipt of proposals was 18 September, 2008.

### *Project Planning*

Bearing in mind the capacity of the applicant organizations, the project formulation was kept simple. The proponents were required to submit a two-page proposal on a prescribed format, and encouraged to apply in the language of their choice; many small organizations work only in the vernacular.

The project proposal format was designed to bring out and highlight the outputs and results, and for proponents to understand and appreciate the link between activities and results. The budget was to be formulated using a standard format, which identified the key expense items.

The eligible proposals, on receipt, were carefully reviewed to ensure the inclusion of all essential information. The budgets were reviewed along with the proposals in order to standardise the provision for certain items across all projects (e.g. remuneration for project staff) and to look for ways and means of reducing costs. Project duration and funding was limited to one year and LKR 500,000 respectively.

Fifty-two (52) proposals were received by the deadline; the breakdown by geographic areas is presented in Table 1.1.

**Table 1.1 – Analysis of proposals by geographic area**

| Geographic area | Number of proposals |
|---|---|
| Puttalam | 08 |
| Maduganga | 15 |
| Rekawa - Ussangoda - Kalametiya and associated areas | 08 |
| Panama | 04 |
| Pottuvil | 05 |
| Batticaloa | 09 |
| Non-prioritized areas | 02 |
| Covers more than one area | 01 |
| **Total** | **52** |

***Evaluation of proposals***

A preliminary screening by IUCN SL, using the SGP Guidelines, led to 15 of the 52 proposals being rejected. The main reasons for rejection were: project activities based in non-prioritized geographic areas, proponent's very poor past performance in small grants, and nonconformity with the MFF objectives. However, four rejected proposals were discussed with their proponents to explore revising them to conform to SGP Guidelines.

The first technical review showed that most proponents had the right ideas, but their proposals needed considerable improvement, particularly in regard to the output-based approach and output-based budgeting.

The SGP Team at IUCN SL, in consultation with the NCB, undertook a 'mentoring' programme for prospective grantees. Rather than reject proposals with project cycle short-comings, they thought it would be more productive to guide prospective grantees to improve their proposals, especially in regard to

the programme objectives and approach. Consequently, all proponents were met, either in groups or individually, and helped to improve their proposals (see Table 1.2). The 'mentoring' programme with the proponents was very useful in fine-tuning the proposals, linking budgets to outputs/deliverables, agreeing on a time schedule and focusing on implementation arrangements.

**Table 1.2 – Schedule of discussions with proponents**

| Geographic area | Date of meeting |
|---|---|
| Puttalam | 7 October, 2008 |
| Rekawa-Ussangoda- Kalametiya | 13 October, 2008 |
| Maduganga | 16 October, 2008 |
| Panama | 13 November, 2008 |
| Pottuvil | 13 November, 2008 |
| Batticaloa | 13 November, 2008[2] |

Meetings with the proponents proved to be very useful, not only in refining the proposals but also in establishing a network of organisations interested in coastal ecosystem management, and in IUCN's work. Of greater significance was the proponents' desire to network and share their experience and capacities to address issues relating to a given locality. Following the meetings, 37 revised proposals were received. A technical sub-committee of the NCB reviewed them on 18 December, 2008 and approved all 37 proposals. As only USD 100,000 was available at that point in time, the sub-committee prioritised 23 proposals for funding.

IUCN Sri Lanka was able to leverage funds from Canadian International Development Agency (CIDA) to fund the projects in the Eastern Province. The CIDA funds and an additional USD 50,000 provided by MFF in 2009, enabled IUCN Sri Lanka to award the balance 14 grants, as well as another four projects, which were awarded as follow up projects.

NGOs and CBOs received 38 of the 41 grants; 25 to NGOs and 13 to CBOs. Of the balance, two went to the private sector and one to a quasi-government institution. Most of the projects were to be implemented in the Puttalam, Maduganga and RUK geographic areas, with nine in each area (Fig. 2).

2 Telephonic discussions were held with a proponent who had submitted five proposals, with a view to amalgamating them.

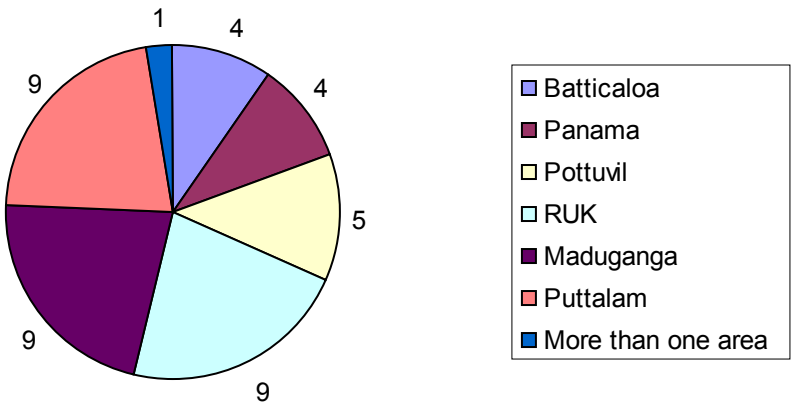



**Fig. 2 – Distribution of projects over geographic areas**

Whilst sustainable coastal ecosystem management was their common goal, the 41 projects could be grouped into three thematic areas, based on their approach: 17 on Ecosystem Restoration, nine on Education and Awareness and 15 on Livelihood Enhancement (Fig. 3).

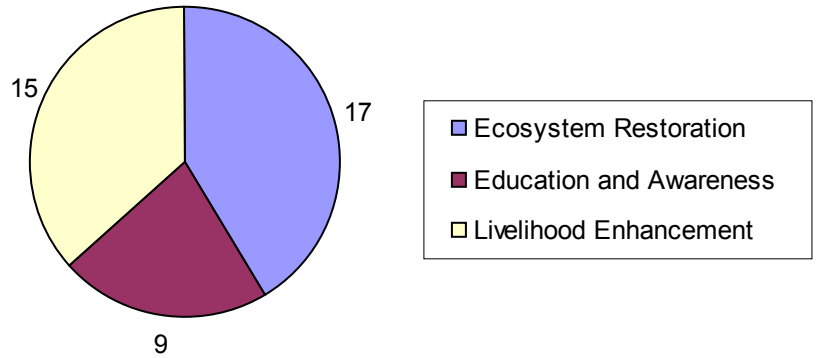



**Fig. 3 – Distribution of projects by thematic areas**

Ecosystem Restoration concentrated on coastal planting, mangrove planting, river and tank bank planting, removal of invasive species and other eco-friendly initiatives, while the Education and Awareness projects undertook environmental education programmes for school children, printing a monthly environmental magazine, preparing teaching aids and a teaching guide, equipping a water testing facility, and renovating an environmental information centre. The projects on Livelihood Enhancement covered cultivation of *Aloe vera,* seaweed culture, cage culture of fin-fish, livestock rearing, home gardening, handicraft production and ecotourism.

***Overseeing project implementation***

Once a proposal was approved, a contract was signed between IUCN SL and the grantee setting out the scope of work and the budget. The contract document was available in all three languages as some grantees only communicated in the vernacular language.

A programme brochure was produced in Sinhala, English and Tamil during the inception period. This brochure was very useful in creating awareness of the programme amongst the communities.

A project team was set up at IUCN SL to oversee the process. The team comprised of the Country Representative, a Senior Programme Officer, a Finance Officer and a Secretary supported by the Programme Coordinator.

## 1.4 Reporting

The proponents were required to submit quarterly progress reports. The deliverables were to be the main focus of the report and a simple format was developed for this purpose (see Annex 1). At the inception, the grantees were briefed on the reporting format with emphasis on the need to report on the deliverables, rather than on activities.

## 1.5 Financial management

The project budgets ranged from around LKR 370,000 to a maximum of LKR 500,000. Generally, IUCN released an advance of 30% on signing the contract. However, considering the size of the grant and the administration costs involved it was increased to 50%.

The procedure for reimbursing expenditure and the supporting documentation needed was explained to the grantees. A format for the reimbursement claims was also provided (Annex 2). This format was designed to enable grantees to keep track of the expenditure and the budget balances available.

A dedicated finance officer at IUCN worked very closely with the Senior Programme Officer and the Project Secretary to support the grantees with their reimbursement claims. Their queries and requests for information on the expense approval process were promptly addressed.

Overall, the financial management aspects of the SGP were very satisfactory. The support provided by the MFF Team was appreciated by the grantees, and the entire process can be considered as hands-on capacity building on project financial management.

Nevertheless, financial irregularities were detected in three projects. In all three projects, which had to be cancelled, the physical progress was inadequate to cover the initial advance provided. The main irregularities observed were:

- Lack of financial controls at the grantee organization. This is mainly due to the governance structure of the organization, which entrusts all decisions and authorizations to one person.
- Submission of fraudulent documents.
- Advancing project funds for other work.

Registration with an appropriate authority, and experience in project management and financial administration were eligibility criteria for organizations seeking grants. However, it was evident that some organizations did not have the necessary governance structure to efficiently and effectively implement the project.

## 1.6 Monitoring, learning and evaluation

In spite of the large number of grants, the MFF SGP team from IUCN visited all the grantees at least thrice during the project life. Considering the geographical spread of the locations, these visits were strenuous; yet it provided a bondage and trust between the SGP Team and the grantees. During these visits, the physical progress was verified, and discussions were held with the project staff to elicit information on project findings and to ascertain constraints for effective project implementation. These discussions revealed that some grantees had made certain scientific observations and required technical assistance to further develop their ideas. For example, the observations made by some grantees on the uneven performance of mangrove plantings were taken to a national workshop. Such assistance was provided as and when required. These visits were also used to discuss financial management matters and to seek clarifications on the queries raised on their submissions.

In retrospect, it is clear that these regular visits were very useful not only to build a rapport with the grantees, but also to guide and steer project implementation as per the original timelines. Towards the end of the programme, workshops were held to share lessons from the different projects. Four workshops were held: one each in the Eastern Province, RUK area, Maduganga and Puttalam. Clearly, the workshops were an opportunity for networking among the grantees as well as for sharing of experiences and resources. Some grantees had succeeded in leveraging additional funds to expand their activities. The lessons learned workshops were very useful; the information in this booklet was enriched from the outputs of these workshops. Ten posters, based on project outputs, were produced for display at outreach events etc. (Annex 3).

Sustainability of the initiatives was paramount and this was emphasised at every opportunity. It was therefore pleasing to note that many of the projects, particularly those relating to livelihoods, are continuing after the project. In many cases, the community organizations have taken upon themselves the responsibility of maintaining coastal plantings and mangrove rehabilitation work on a voluntary basis. This was evident during post-project visits.

A fuller account of the lessons learned is presented in Chapter 5.

# 2. Ecosystem Restoration

Restoring the ecosystems affected by the tsunami has been a felt need, both by the Government as well as the communities. After the tsunami, the communities came to realize the importance of the products and services to be had from ecosystems. This is partly due to the awareness creation programmes conducted extensively by several agencies in the tsunami affected areas. As a result, there was considerable interest in the Small Grants Programme for ecosystem restoration activities. As much as 40% of the projects granted focused on different aspects of ecosystem restoration such as coastal planting, mangrove replanting, river bank planting, removal of invasive species, etc.

Ecosystem restoration is, by and large, a long-term undertaking. Nevertheless, local level small scale initiatives leading to ecosystem restoration were considered important as they could serve as lessons for the communities, as well as models for replication and scaling up. Selected initiatives are described in this chapter.

## 2.1 Coastal planting

### 2.1.1 Coastal planting in Ethukkaal and Hadjiar beaches in Kattankudy

**Location:** Batticaloa, on the east coast of Sri Lanka


**Green belt with eco-friendly protective covers at Hadjiar beach (Ranjith Mahindapala)**

**Background:**

Coastal vegetation of Ethukkaal and Hadjiar beaches in Kattankudy has been badly hit by natural hazards at least twice in recent times; first by the 1978 Cyclone and then by the 2004 Tsunami. It appears that the cyclone damage was not effectively restored, nor have the beach areas been properly maintained since. The tsunami has destroyed whatever vegetation that was left and the beaches are now devoid of vegetation. Prior to the tsunami the communities were fond of spending their evenings leisurely on the beach. The bareness of the beaches has discouraged them from this refreshing and wholesome practice.

Coastal vegetation has a protective function. It reduces the vulnerability of the coast and shoreline to erosion. Aiming to establish a protective cover of coastal vegetation that will also bring about a much needed shaded beach to promote socializing among the community families, Arifa Enterprises undertook two pilot-scale coastal replanting programmes in the Ethukkaal and Hadjiar beaches.

**Interventions:**

*(a)* In consultation with the Forest Department, 270 *Casuarina* and 30 *Barringtonia* plants were established in the Ethukkaal and Hadjiar beach areas.

*(b)* The communities in these beach areas were mobilized to enlist their assistance in raising and protecting the plants.

*(c)* Eco-friendly protective covers were utilized to protect the plants from harsh, salt-laden winds. The cover had a wooden frame covered with Palmyrah leaves. Frames were made out of discarded pieces of timber from a nearby timber yard.

*(d)* An Abyssinian well was constructed at each site to supply water for the plants and also for general use.

**Achievements:**

One year after planting out, over 90% of the plants in the two beach areas have survived and are growing well. A green belt, 0.5 km long and 4 m wide, has been established on each site within a period of 12 months.

The outstanding success of this planting programme can be attributed to the provision of wells at each site to facilitate regular watering, protecting the plants from the desiccating winds, and last but not least, the community involvement in maintaining the plantations.

***Barringtonia* plant and *Casuarina* plant after 11 months of planting (Kumudini Ekaratne)**

**Abyssinian well (Kumudini Ekaratne)**

**What has changed or is likely to change**

Both *Casuarina* and *Barringtonia* plants are very healthy and show signs of vigorous growth. These trees, in the course of time, will provide coastal protection as well as a shaded recreation area to be enjoyed by the community.

Encouraged by the success and especially, the support and appreciation of the communities, the grantee has gladly volunteered to look after the plants for another three years.

### 2.1.2 Establishing a coastal green belt with community participation to restore the bioshield in South Kumana

**Location:** Panama, on the south-eastern coast of Sri Lanka

South Kumana is a remote coastal village located in south-eastern Sri Lanka. The damage from the 2004 Tsunami was negligible as the well-established sand dunes and the coastal vegetation took the brunt of the incoming waves. However, the sand dunes breached at a weak point killing one person and destroying the coastal vegetation in the immediate vicinity. The protection provided by the bioshield was appreciated by the community and the need to restore the damaged green belt was priority.

National Ethnic Unity Foundation (NEUF) came forward to restore the vegetation in a 300 m long, 4 m wide belt amounting to 1,200 m².

**Interventions:**

*(a)* The communities were mobilized and their awareness on the importance of coastal conservation was raised, a Coastal Conservation Society was formed, and 12 women were selected to carry out project activities.

*(b)* A live fence, with a coconut and palmyrah frond cladding, was erected around the proposed planting area. This area was divided into six units; the responsibility for each 50 m x 4 m unit was assigned to two women.

*(c)* The fenced area was planted with 2,880 seedlings of mixed species Maila (*Bauhinia racemosa*), Wara (*Calotropis gigantea*), damba (*Syzygium assimile*) and Palmyrah (*Borassus flabellifer*).

*(d)* An Abyssinian well was constructed to irrigate the plants.

*(e)* The 12 women assigned to maintain the green belt were provided financial assistance (LKR 5,000 each – about US $ 50) for self-employment activities, as an incentive.

**Achievements:**

- Overall, 51% of the seedlings survived and were growing well at the end of the project. Survival rates differed with *Borassus flabellifer* recording the lowest rate of 4%. *Bauhinia racemosa* had the highest survival rate of 75% followed by *Syzygium assimile* (62%) and *Calotropis gigantea* (49%).

Green belt with mixed species in March, 2009 (Kumudini Ekaratne)

Green belt with mixed species in January, 2010 (Kumudini Ekaratne)

- Assigning the six units to different teams created a healthy spirit of competition amongst them to show results. Furthermore, this work was facilitated by the formation of a Coastal Conservation Society "*Dilena Tharu (*=shining stars*)*" by the women's group. The Society is committed to maintain the green belt.

- The women have been trained in nursery management, planting techniques, and enterprise development techniques.

- The financial assistance provided has been well utilised and has enabled the women to engage in several income generating activities:

**Income generating activities**

**Lobster fishery (Kumudini Ekaratne)**

**Brick making (Kumudini Ekaratne)**

**Tailoring (Kumudini Ekaratne)**

- Two women are engaged in lobster fishery in the sea off Panama. Lobsters fetch a good price (over LKR 1,000/= per kg). They will divert to other fishery methods such as cast netting during the off season for lobsters.

- Two women who were previously engaged in small scale brick making, using clay dug out from their gardens, have expanded their businesses. The awareness raised through the project will ensure no damage is done to the environment.

- One woman who was previously engaged in tailoring has expanded her business venture by purchasing a new sewing machine with the facility for embroidery.

- Two women have started trading; one has opened a small grocery which was a long felt need in the area, and the other retails bakery products brought in bulk from the nearby town. The bakery products are in great demand. She now receives prior orders from the villagers, which ensures that she is not left with unsold items.

- Five women have started home gardening with crops such as vegetables, pulses, chilies and peanut. This not only provides an additional income by selling the surplus, the households are assured of fresh vegetables.

**Problems encountered:**

The survival rates of the four plant species varied widely ranging from 4% to 75%. The women are puzzled as to why some species establish better than others, and are addressing this issue.

**What has changed or is likely to change**

The breach in South Kumana's bioshield has been restored. A green belt of 1,200 $m^2$ comprised of four coastal plant species has been established to provide much needed protection from natural hazards.

The 12 women who nurtured this green belt have invested their financial rewards in a sound and productive way that has yielded positive results for them and the community.

## 2.2 Replanting mangroves

Fourteen Small Grant Projects undertook the restoration of mangrove areas, affected by the 2004 Tsunami, in the different parts of Sri Lanka. The following four examples, which are almost exclusively devoted to mangrove replanting, exemplify the type of work undertaken:

### 2.2.1 Replanting mangroves in Batticaloa lagoon.

**Location:** Batticaloa, on the east coast of Sri Lanka

A few decades ago, the 2,395 $km^2$ Batticaloa lagoon, famed for its singing fish, was replete with healthy mangrove stands. However, due to natural disasters and human activities, the quality of the mangroves has deteriorated. Deforestation has also taken place in certain areas. MANDRU, a local NGO, took over the task of restoring the mangrove forests at six locations in Batticaloa.

**Interventions:**

*(a)* A technical appraisal was carried out and six sites, totaling up to 39 ha, were selected for planting mangroves.

*(b)* About 17,000 mangrove seedlings, of eight species, were raised in nurseries.

*(c)* A 180 mangrove enclosures (10 m x10 m) were marked out at the six sites, and the 17,000 seedlings were planted in these enclosures in March 2009.

*(d)* Public awareness and school education programmes were conducted on the importance of mangroves in the Batticaloa lagoon.

Replanted *Rhizophora mucronata* in Thiruperunthurai (Kumudini Ekaratne)

**Achievements:**

- Seedlings of *Rhizophora mucronata*, *Excoecaria agallocha*, *Hibiscus* spp, *Cerebus manga, Sonneratia alba*, *Bruguiera gymnorrhiza*, *Lumnitzera racemosa,* and *Avicennia marina,* totaling 17,000 seedlings, were successfully raised in nurseries, and planted out over 39 ha, at six sites (Thiruperunthurai, Trinco Road, Lake Road, Dutch Bar, Bar Road and Munich Road).

- On average, 40% of the seedlings survived at the Thiruperunthurai, Trinco Road, Lake Road and Dutch Bar sites, at the end of 12 months.

**Problems encountered:**

- Survival rate at Bar Road and Munich Road sites was low due to the seedlings being uprooted by the high wave action in the lagoon.

- A fungal infection in May 2009 also contributed to the low survival rates, overall.

**What has changed or is likely to change**

Mangrove cover in four out of the six locations (Thiruperunthurai, Trinco Road, Lake Road and Dutch Bar) has been increased considerably. As the grantee has commenced filling in the vacancies at all six sites further improvement in the mangrove stands may be expected.

### 2.2.2 Replanting mangroves in Pottuvil Lagoon near Manthode

**Location:** Pottuvil, on the east coast of Sri Lanka

Manthode is a village bordering the Pottuvil lagoon on the east coast of Sri Lanka. The 2004 Tsunami destroyed the mangroves fringing this large lagoon. The villagers of Manthode whose main livelihood is lagoon fishing noted a decline in their catches and ascribed it to the dwindling of the mangrove stands. True Vision Rural Rehabilitation Organization (TVRRO), an NGO in Pottuvil, stepped in to restore the damaged mangrove patches.

**Interventions:**

*(a)* The lagoon fishermen in Manthode were mobilized and two large community operated nurseries were established to raise mangrove seedlings.

*(b)* Around 10,000 mangrove seedlings were raised in the nurseries with propagules collected by the community.

**Achievements:**

- About six thousand seedlings of *Rhizophora mucronata,* and 1,000 seedlings of *Avicennia marina* raised in the nurseries were planted out in August of 2009. A further 4,000 seedlings of *R. mucronata* were raised and planted out to meet an unexpected shortage of nursery plants.

- The survival rate in the field, at the end of 12 months, was 80% in *R. mucronata* and 30% in *A. marina*.

Mangrove nursery
(Ranjith Mahindapala)

Replanted mangroves in Manthode
(Kumudini Ekaratne)

Present custodians of replanted mangroves in Manthode
(Kumudini Ekaratne)

**Problems encountered:**

- Action was also taken to raise *Aegiceras corniculatum* seedlings. However, all 3,000 seedlings in the nursery died quite unexpectedly. TVRRO is trying to figure out the factors that caused this debacle.

**What has changed or is likely to change**

Lagoon fishermen in Manthode are now well aware of the importance of mangroves for their livelihoods. They have enhanced their knowledge on setting up and maintaining seedling nurseries and planting of mangroves, which is a new vocation. They have been motivated to look after the mangroves. The improving mangrove cover brought about by planting will not only improve the biodiversity of the lagoon, but also their fish catch.

### 2.2.3 Community-based mangrove planting at Kurakkanhena

**Location:** Puttalam, on the north-western coast of Sri Lanka

Puttalam lagoon on the north-western coastline of Sri Lanka is noted nationally for its high biodiversity. The lagoon includes around 600 ha of mangroves, 700 ha of salt marshes, extensive mud flats, sea grass beds and the estuaries of two rivers, Kala Oya and Mee Oya. Kurakkanhena is located in the Kurinyanpitiya North Grama Niladhari Division, of Kalpitiya DS Division. It is a village bordering the northern part of the Puttalam lagoon. The main livelihood of the communities living around the lagoon is lagoon fishery. The rich mangrove stands which bordered the lagoon have deteriorated over time due to the extraction of fuel wood by the communities.

A leading fishery society in Kudawa, near Kalpitiya, Semuthu Fisheries Cooperative Society Ltd., secured a small grant to restore the dwindling mangrove vegetation, educate the communities and school children on the value of mangroves and to undertake pilot scale replanting. The project activities were implemented in partnership with St. Mary's Fisheries Co-operative Society of Kurakkanhena, being the only society operational in the project area.

**Interventions:**

*(a)* The locations for replanting and appropriate mangrove species were selected, taking into consideration the existing natural vegetation in the area.

*(b)* Community members from St. Mary's Fisheries Co-operative Society were trained in nursery establishment and management.

*(c)* Seven mangrove nurseries were established; seeds, equipment and the requisite materials to raise seedlings were provided.

*(d)* Mangrove replanting campaign was carried out with community participation.

*(e)* The planted area was fenced to protect the plants from grazing animals.

*(f)* Awareness programmes were conducted for school children and members of St. Mary's Fisheries Co-operative Society, on the importance of mangroves and mangrove fauna.

*(g)* Fuel efficient firewood-gas stoves (30 units) were supplied to community members to reduce the use of fuel wood from mangroves.

**Replanted mangroves on Kurakkanhena (Kumudini Ekaratne)**

**Achievements:**

- Nearly 400 students from three schools in Kandakuliya and Kalpitiya, and 65 members of the St. Mary's Fisheries Co-operative Society participated in activities to create awareness of the importance of mangrove ecosystems. This augurs well for the future.
- Members of St. Mary's Fisheries Co-operative Society, engaged in project activities, acquired a high level of competence in mangrove nursery maintenance.
- Seven community-based nurseries raised over 12,000 seedlings.
- An extent of 4,000 $m^2$ were planted as follows:

- Seven thousand five hundred (7,500) plants - 5,000 *Avicennia marina* plants and 2,500 *Lumnitzera racemosa* plants - raised in community nurseries, were planted in June, 2009.

- 2,500 plants of *Excoecaria agallocha* purchased from outside sources were planted in July, 2009. *E. agallocha* plants could not be raised in the community nurseries as seeds were not available in the area.

- 5,000 *Rhizophora mucronata* propagules were planted in July on the seaward side of the plantation as a community contribution

- 2,000 *Rhizophora mucronata* propagules, 2,500 *Avicennia marina seeds, 2,500 Avicennia marina* plants, 1,000 each of *Excoecaria agallocha* and *Lumnitzera racemosa* plants were planted out in October 2009.

• A brochure on mangroves, in Sinhala and Tamil, was printed and distributed.

**Problems encountered:**

Survival rates of mangrove seedlings showed a wide variation. Some interesting observations in this regard have been recorded by the NGO for further investigation. The main observations, which are being followed up by the NGO, are:

- All *E. agallocha* seedlings planted in July died; 65% planted in October survived

- Survival rate of seedlings planted in June was negligible [0.5% of *A. marina* and 1% of *L. racemosa*]; 70% of *A. marina* planted in October survived.

- Seeds of *A. marina* directly planted in October was a complete failure.

- Survival rate of *R. mucronata* propagules planted in July and October was 55% and 75%, respectively.

**What has changed or is likely to change**

The NGO has recognized and taken note of the fact that mangrove planting cannot be undertaken haphazardly. Rather, there is a scientific basis. The NGO is analyzing the performance data to understand the reasons for the

wide variation observed in survival rates; the main issues at hand are planting time (related possibly to salinity levels and climatic and weather factors), appropriateness of the species, and the method of planting (direct seeding vs potted plants). Field experiences have been brought to the attention of scientists at a colloquium, and guidelines for mangrove planting are being developed.

Thirty households using fuel efficient stoves provided by the project have reduced their usage of mangroves fuel wood by about 50%.

### 2.2.4 Replanting mangroves in a degraded sector of the Dutch Canal to enhance ecosystem productivity

**Location:** Puttalam, on the north-western coast of Sri Lanka

The Dutch Canal in the north-western part of the country was constructed during the Dutch reign of the maritime districts of Sri Lanka (then Ceylon). The Dutch Canal was a popular navigation route for trade. The 100 km long canal, which is still being used for various purposes, runs through the Negombo town and heads for the Puttalam lagoon. The mangrove stands which dot the canal banks have been surreptitiously cleared for the establishment of shrimp farms. This has resulted in the depletion of fin-fish and crustacean catches.

The National Aquaculture Development Authority of Sri Lanka (NAQDA) obtained a small grant to restore a section of the depleted mangrove areas. The longer term objective of the project was to improve the water quality of the canal ecosystem and fish breeding grounds, and thereby improve the income of the fishing community.

Replanted mangroves in Viruthodai I (Kumudini Ekaratne)

**Interventions:**

*(a)* Sites for mangrove replanting were selected on the basis of a survey done by the National Aquatic Research Agency (NARA).

*(b)* Around 15,000 mangrove seedlings were planted in a 5 ha extent of the canal reservation, with community participation.

*(c)* A mangrove demonstration plot, 0.03 ha (10 perches) in extent, was established in the vicinity of the Dutch canal.

*(d)* Awareness programmes on the importance of mangroves were conducted.

**Achievements:**

- Three sites, Viruthodai I, Viruthodai II and Kadayamottai (alternate canal), covering an area of 4.6 ha, have been planted with 11,080 seedlings of *Rhizophora mucronata, Bruguiera gymnorrhiza*, *Avecennia marina, Xylocarpus gamatum, Ceriops tagal* and *Excoecaria agallocha* (Table 2.1).

- A demonstration plot was established between Viruthodai site I and II and planted with 70 grown/mature plants of 14 different species. The species comprised of *Rhizohora mucronata, Rhizophora apiculata, Aegiceras cornuculatum, Excoecaria agallocha, Ceriops tagal, Sonneratia caseolaris, Sonneratia alba, Avecennia marina, Avecennia officinalis, Acanthus ilicifolius, Bruguiera gymnorrhiza, Bruguiera sexangula, Lumnitzera racemosa* and *Nypa fruticans.*

- Two awareness programmes on the importance of mangroves were conducted for 100 school children.

- At the end of December 2009 overall survival was around 80%. However, most seedlings were planted only in November; observations over a period of several months are necessary to arrive at a reliable conclusion.

**What has changed or is likely to change**

It is still early days. Hopefully, the establishment of the demonstration plot, the awareness programmes for school children and the community participation would motivate the community to protect the replanted areas.

**Table 2.1 - Species, dates and number of seedlings planted**

| Site | Species | Planting dates | Number planted |
|---|---|---|---|
| Viruthodai I | *R. mucronata* | 26-27 August, 2009 | **1,080** |
| | | | |
| Viruthodai II | *R. mucronata* | 1-3 September, 2009 | 3,000 |
| | | 27-28 November, 2009 | 940 |
| | *B. gymnorrhiza* | 8 October, 2009 | 145 |
| | *Xylocarpus gamatum* | 2 September, 2009 | 135 |
| | *A. marina* | 7 October, 2009 | 200 |
| | *Ceriops tagal* | 10 August, 2009 | 80 |
| | | 27-28 November, 2009 | 500 |
| | | | **5,000** |
| | | | |
| Kadayamottai | *R. mucronata* | 16-21 November, 2009 | 4,920 |
| | *Excoecaria agallocha* | 16-21 November, 2009 | 80 |
| | | | **5,000** |
| **Total** | | | **11,080** |

## 2.3 Removing invasive species

### 2.3.1 Removing Pond apple *(Annona glabra)* from selected locations in the Maduganga wetland

**Location:** Maduganga, on the South-western coast of Sri Lanka

*Annona glabra,* commonly known as Pond-apple, is a tropical fruit tree. Pond-apple is an aggressive invader that grows in estuaries and chokes mangrove swamps. Its seedlings carpet the banks and prevent other species from germinating or thriving. The dense thickets it forms can gradually replace everything else in the canopy, and pose a threat to wetlands and native mangrove communities.

The Maduganga wetland, located in Balapitiya in the south is a RAMSAR site in Sri Lanka. In the recent past, several areas of the wetland are being threatened

by the invasive *A. glabra*. Maduganga Development Foundation, an NGO in Balapitiya, took timely intervention to control the spread of this invasive species and restore the area by planting mangroves with the financial assistance of a small grant.

**Interventions:**

A selected area was cleared of *Annona glabra* and restored by planting mangroves.

**Achievements:**

*A. glabra* was physically and mechanically removed from an area of 0.2 ha, and the cleared area was planted with 1,800 seedlings of *Rhizophora mucronata.*

**Area removed of *A. glabra* (Kumudini Ekaratne)**

**Area restored with *Rhizophora mucronata* (Angela Fernando)**

**Problems encountered:**

The plan was to clear *A. glabra* from an extent of 0.6 ha (1.5 ac). However, the extent had to be reduced due to an increase in back-hoe hire charges since the submission of the project proposal.

**What has changed or is likely to change**

The grantee will be actively engaged in monitoring the growth of *R. mucronata* planted in the cleared area. They will look out for signs of recurrence of *A. glabra* and take necessary action. Clearing the area *per se* is likely to facilitate natural regeneration of native flora.

### 2.3.2 Removing Cattail *(Typha angustifolia)* from a village drainage water canal

**Location:** Rekawa-Ussangoda-Kalametiya and the associated areas, on the Southern coast of Sri Lanka

The aquatic reed *Typha angustifolia* grows along lake margins and in marshes, often in dense colonies, and is considered a weed when it invades managed wetlands. This plant occurs frequently in many water bodies in Sri Lanka.

Located in the deep south, Lunama is a village which lies between the coast and the main southern highway. The main livelihood of the community living closer to the coast is fisheries, while those who live away from the coast practice agriculture. The majority of the agriculturists are paddy farmers; others cultivate vegetables. An irrigation canal supplies water to the paddy fields and the excess water from the paddy fields is drained to the Lunama lagoon through a 5 meter wide outlet canal known as "*Lunama meda basnawa*". In recent times, the lagoon end of this outlet canal has shown signs of clogging up due to the fast spreading invasive *T. angustifolia* and impeding the drainage of about 10 ha of paddy fields belonging to 25 farmers. This has rendered the fields uncultivable and also affected the hydrology of the Lunama lagoon.

Having secured a small grant, the Youth Enterprise Information Centre, a local NGO, undertook the removal of *T. angustifolia* with the participation of the 25 paddy farmers who have been affected.

**Interventions:**

*T. angustifolia* was removed from a selected length of the drainage canal, with the assistance of the affected paddy farmers.

**Achievements:**

- The initial plan was to remove *T. angustifolia* from an area of 2,500 m² (i.e. a 500 m length of the 5 m wide canal, extending upwards from the lagoon). However, by the end of the project, 3,750 m² of the canal had been cleared of the invasive species. The paddy farmers cleared the canal manually instead of using machinery as budgeted in the project proposal. The paddy farmers' contribution to this effort enabled them to increase the cleared area by 1,250 m², which is 50% more than the planned extent.

- Water flow in the canal has been restored and thereby the hydrological balance of the lagoon has been improved.

**Drainage water canal – before removal of *Typha angustifolia* (Kumudini Ekaratne)**

**Drainage water canal – after removal of *Typha angustifolia* (Angela Fernando)**

**What has changed or is likely to change**

Ten hectares of paddy field that were fallow are now being cultivated without any hindrance from water logging. This enabled each of the 25 paddy farmers to earn an additional income of LKR 25,000 per season.

## 2.4 Other eco-friendly initiatives

### 2.4.1 Restoring a village tank

**Location:** Rekawa-Ussangoda-Kalametiya and the associated areas, on the Southern coast of Sri Lanka

In early 1980's, Palugaswewa farm in Lunama was established under the government's village reawakening scheme mainly to support 22 low income fisher families. Each family received a plot of 0.4 ha for rainfed cultivation. The Palugaswewa tank with a 6 hectare-meter capacity, situated adjoining the farm, was a possible source of water for off-season cultivation. However, the tank did not contain enough water during the off-season due to low rainfall in the area and the dilapidated and silted state of the tank. A solution was to rehabilitate the tank and substantially increase its water holding capacity.

Youth Enterprise Information Centre secured a small grant to restore this village tank and thereby increase its water holding capacity.

**Interventions:**

*(a)* The tank area was cleared of vegetation with the assistance of the 22 farm families.

*(b)* The tank was mechanically dredged and its bund strengthened.

*(c)* *Pathok ara*, a stream that drained excess rain water from the forest area to the sea, was diverted to the restored tank by building an anicut across it.

*(d)* A supply canal was constructed to bring water from the tank to the farm.

**Achievements:**

The capacity of the Palugaswewa Tank has been increased from 6 to 14 hectare-meters.

Restored village tank (Kumudini Ekaratne)

**What has changed or is likely to change**

An irrigation system is in place to serve Palugaswewa Farm. Twenty two (22) farm families are now able to cultivate their plots during the dry season. The increase in income due to the additional season of cultivation ranges from LKR 3,000–20,000 per farm family.

### 2.4.2 Cultivating bamboo as a wood substitute to save Rekawa Lagoon mangroves and for erosion control.

**Location**: Rekawa-Ussangoda-Kalametiya and the associated areas, on the southern coast of Sri Lanka

Rekawa lagoon, 250 ha in extent, is very productive, and a large community depends on it for their livelihoods. Its associated mangroves and scrub forest, their main source of wood, are gradually declining due mainly to the continuous extraction of timber, poles and fuel wood. The shores of the lagoon have also degraded, and the lagoon is silting up in many places. Unsustainable utilization of mangroves has a direct impact on the lagoon fishery and the need to develop an alternative wood source was evident.

The NGO, Ruhunu Development Consortium (RDC), obtained a small grant to introduce the cultivation of bamboo (*Dendrocalamus hookeri)* as a substitute for wood. Bamboo is widely used in the construction industry for scaffolding, and in the construction of roofs and walls of houses. Another feature of bamboo is its soil binding qualities due to its diffused root structure, and is therefore a very

useful plant in river, tank and stream banks to reduce erosion. RDC planted bamboo both in home gardens (as a substitute for wood) and in the banks of water courses and water bodies for erosion control. Its leaves are a valuable fodder for livestock.

**Interventions:**

*(a)* Communities and other potential beneficiaries in Boralluwa, Hettiyapokuna, Beliwalagoda, Netolpitiya, and Kapuhenwela villages, surrounding the Rekawa lagoon, were identified and mobilized; and programmes to create awareness were conducted.

*(b)* Selected community members were trained on raising bamboo planting material.

*(c)* Three community-based plant nurseries to propagate bamboo planting material were established in Rekawa.

*(d)* Bamboo plantlets raised in the nurseries were planted out in selected locations.

*(e)* Lessons learned material or case studies were developed for dissemination

**Achievements:**

- More than 90 families received awareness raising on conservation of mangroves and the use of alternative wood sources.
- Three community members have been trained in propagation techniques and bamboo nursery management at the Riverine Bamboo Planting Project in Kotmale run by the Mahaweli Authority of Sri Lanka.
- Four thousand five hundred (4,500) bamboo plantlets were propagated.

Bamboo nursery (Angela Frenando)

School children planting bamboo (Courtesy RDC)

- Fifteen hectares of riverbanks, tanks and lagoon-banks, including home gardens bordering water canals, and a few public places such as schools and temples were planted with 4,500 bamboo plantlets in December 2009.

- A case study on the project has been produced as one of the outputs. This will be useful when replicating the project elsewhere.

**What has changed or is likely to change**

The demand for bamboo plantlets by the communities has increased following the implementation of the project. All three community-operated nurseries continue to raise plantlets to meet this demand.

The communities have taken to the cultivation of bamboo with commendable enthusiasm. This augurs well for the future. In due course, riverbanks, lakes and lagoon-banks will be stabilized and protected from erosion, and the utilization of mangroves as a wood source will diminish.

### 2.4.3 Reducing fuel wood usage to save mangroves

The communities living in the vicinity of mangroves generally extract fuel wood from mangroves for their household needs. It is their main source of fuel wood. The traditional open hearth consumes an average of 4 kg of fuel wood a day

to cook three meals for a family of four. Open hearths are very inefficient fuel wise, as much of the heat generated is unutilized and lost to the surroundings. In an effort to address this a few initiatives were implemented as sub-activities in four projects. These included the establishment of a biogas plant to supply cooking gas, and the introduction of fuel efficient cooking stoves.

### *2.4.3.1 Community biogas plant in Mohottiwatte, Balapitiya*

**Location:** Maduganga, on the South-western coast of Sri Lanka

**Background:**

Mohottiwatte is a village by the Maduganga wetland. The more affluent households in the village use liquid petroleum gas for cooking but the majority use fuel wood. As Mohottiwatte had no organized garbage collection service the villagers dumped kitchen waste in the nearby estuary. To kill two birds with one stone - reduce fuel wood extraction from mangroves and pollution of the estuary - the Human & Environment Links Progressive Organization (HELP-O) constructed a biogas plant on a privately owned property in Mohottiwatte. They planned to supply cooking gas to three households in the immediate vicinity.

**Interventions:**

*(a)* A 12 cubic meter biogas plant was constructed.

*(b)* The plant was fed with organic household waste, on a daily basis.

*(c)* The biogas generated was supplied to households.

**Achievements:**

- The biogas plant received a much larger amount of kitchen waste than anticipated.
- In addition to the direct beneficiaries (i.e. the householders provided with gas), other community members also brought their kitchen waste to the biogas plant.
- A nearby Home for the Aged and a Boys Home also supplied kitchen waste to the plant.
- The increased supply of kitchen waste enabled four households to be supplied with gas; one more than initially planned.

- As an incentive, kitchen waste suppliers received two bottles of residual slurry each week, for use as a fertilizer in their home gardens.

Bio gas unit
(Kumudini Ekaratne)

Cooking with bio gas
(Kumudini Ekaratne)

**What has changed or is likely to change**

Fuel wood is no longer used for cooking by the direct beneficiaries, the four households supplied with biogas.

Dumping of waste in the estuary, by Mohottiwatta communities, has been reduced considerably as both direct and indirect beneficiaries now take kitchen waste to the biogas plant.

More villagers have taken to homestead gardening spurred by the results of using the liquid fertilizer received from the biogas plant.

### *2.4.3.2 Fuel efficient stoves for coastal communities*

**Location:** Puttalam, on the north-western coast of Sri Lanka

**Background:**

Palavi, Pallivasalthurai (Ammathota Fishing Village), and Kurakkanhena are coastal villages in the Puttalam district. In common with many villages in the country, the communities use fuel wood, including mangroves, for cooking. In order to reduce fuel wood usage, fuel efficient stoves were introduced to 390 households, as sub-activities of three projects.

**Interventions:**

Fuel efficient stoves were supplied to households, as follows:

- 300 stoves in Palavi by Vinivida NGO Coalition for Eradicating Poverty through Knowledge and Communication.
- 60 stoves in Ammathota Fishing Village in Pallivalathurai by PEARLS (Peaceful Environment Assured Right Lasting Solutions).
- 30 stoves in Kurakkanhena by Semuthu Fisheries Cooperative Society Ltd.

Fuel saving stove (Courtesy MCRCF)

**Achievements:**

The fuel efficient stoves, a novel concept for the communities, are being used by all 390 households. Users reported that the time taken to cook a standard dhal curry with the fuel efficient stove was less than with the conventional open hearth. So, the new stove is both fuel and time efficient.

Fuel saving stove (Kumudini Ekaratne)

**What has changed or is likely to change**

The fuel efficient cooking stoves have reduced fuel wood usage by 40-50%. Furthermore, due to the higher efficiency of the stoves the women spend less time in preparing meals for the family.

### 2.4.4 Replacing the fishermen's traditional kerosene oil lamps with electric lamps

**Location:** Maduganga, on the South-western coast of Sri Lanka

**Background:**

Generally, fishermen use kerosene lamps during night fishing expeditions. Each fishing boat is estimated to use one litre of kerosene daily, costing LKR 85. As a pilot initiative, 18 fishermen were given electric lamps by the Nagenahiru Foundation. The lamps are charged in the daytime through a community-operated solar panel.

**Interventions:**

Two community-operated solar powered charging units and 18 LED/CFL lamps were supplied to 18 fishermen.

**Achievements:**

- The fishermen no longer use kerosene lamps and this obviates the emission of 3.15 kg of carbon dioxide, and kerosene fumes to the atmosphere by each lamp, each night.
- Each fisherman saves about LKR 25,000 annually, on kerosene.

Electric lamp for night fishing (Kumudini Ekaratne)

Fishing crafts fixed with electric lamps (Kumudini Ekaratne)

**What has changed or is likely to change**

The 18 fishermen enjoy night fishing in an environment devoid of fumes, and with the least possible health hazards. The new lamps also mitigate climate change by reducing emissions of carbon dioxide to the atmosphere.

# 3. Education and Awareness

Raising awareness on environmental issues among school children, youth and the community was the theme of nine projects (22% of the grants awarded). The activities ranged from printing a monthly environmental magazine, school education programmes, support for a water testing facility, renovation of a Mangrove Education Centre and production of a Primary School Teachers' Guide and educational tools. A few examples are discussed in this chapter.

## 3.1 Publishing an Environmental Magazine, *Madupuwath*

**Location:** Maduganga, on the south-western coast of Sri Lanka

Maduganga estuary and islands, a complex coastal wetland ecosystm in the Galle District, was declared a Ramsar site in 2003. Its dense growth of mangrove vegetation harbours a high biodiversity. The 915 ha estuary consists of 770 ha of open water and 15 islands amounting to 145 ha. Ma Duwa, Mirala Duwa and Dik Duwa are relatively large islands.

The estuarine area comprise of several wetland vegetation types including mangroves, mangrove scrub, and bank scrubs. These vegetation types have contributed to a rich biodiversity, with 303 plant species belonging to 95 families. Mangroves harboured the highest number of flora species closely followed by mangrove mixed swamps. The presence of a very rare and threatened mangrove species *Lumnitzera littorea,* is of special significance. The mixed vegetation makes Maduganga an ideal ecotone for a variety of bird species, including aquatic and terrestrial forms. In total, 248 vertebrate species have been recorded, which include 70 species of fish, 12 amphibians, 31 reptiles, 111 bird species (13 winter migrants) and 24 mammal species. Of the invertebrates, 50 species of butterflies and 25 species of molluscs (14 terrestrial and 11 brackish water) have also been recorded.

Threats to the Maduganga wetland are many. The major threats are clearing of mangroves, dumping of garbage, fuel discharge from boats, discharge of agro-chemicals, spread of invasive species and erosion of riverbanks.

The need to warn the community on the dangers faced by this unique ecosystem, and thereby minimize the threat, was recognized by the Maduganga Development Foundation (MDF), a pioneering NGO in the area. They have already started spreading the message through an environmental magazine.

*Madupuwath*, is a monthly environmental magazine devoted to this unique 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 to produce 12 more issues of the magazine, which carries news items and articles on Maduganga area.

**Interventions:**

*(b)* The design and layout of *Madupuwath* was improved to make it more attractive.

*(b)* Volume 5, and subsequent issues were printed in colour

**Achievements:**

- Volumes 5 -11 of *Madupuwath* (i.e. 7 issues) were printed and sold. One thousand copies of each issue were printed.
- The magazine was sold at LKR 30 per copy at local book shops and schools, and at the MDF office.
- While the printing costs of Volumes 5, 6 and 7 were funded by the project, revenue from sales was used to print subsequent issues.


The "new look" Madupuwath (Kumudini Ekaratne)

**Problems encountered:**

The plan was to produce Volumes 5-16 during the 12-month project period. However, production was delayed due to an internal issue at MDF. Up to, and including, Volume 10 was published during the project period. Volume 11 was published thereafter.

**What has changed or is likely to change**

The "new look" *Madupuwath* has gained in popularity among the school children. *Madupuwath* and its environmental messages are now reaching more and more homes in the community. Hopefully, the communities will awaken to the threats faced by this unique wetland and spur them to safeguard their heritage.

## 3.2 Building capacity of school children as a forerunner to sustainable mangrove ecosystem conservation initiatives

**Location:** Rekawa-Ussangoda-Kalametiya and associated areas, on the southern coast of Sri Lanka)

**Background**:

The Rekawa, Ussangoda and Kalametiya (RUK) area is an important coastal zone in Hambantota District providing employment to thousands of fisher families. Five of the six globally threatened turtle species nest on the beaches in the RUK area, and the Rekawa beach has been declared a turtle sanctuary. However, the coastal systems have undergone degradation over time and now the damage is clearly evident. Several harmful activities have been observed including cutting down mangroves, coral mining, poaching, harmful fishing practices such as dynamiting, inland sea shell mining and spread of invasive species.

The Visura Development Foundation (VDF), an organization active in the area, felt the need for an intensive awareness programme as a pre-requisite for other activities to arrest the degradation of the coastal ecosystems. It also felt that awareness programmes that target school children would be very appropriate, as school children would carry the message to adults.

Ambalantota, a coastal town in the Hambantota District, has 23 schools. Although several government and non-governmental agencies have promoted conservation awareness in the RUK area over the past decade, very few have targeted school children in Ambalantota. VDF sought funding from the small

grants programme to build capacity among 50 senior and 50 junior students of Ambalantota Maha Vidyalaya. Having successfully completed the programme within a period of six months, they secured a second grant to replicate the programme in another school; Mawadala Baminiyanwila Jayanthi School also in Ambalantota, targeting 50 senior and 25 junior students.

**Interventions:**

*(a)* Four awareness programmes for junior students and two programmes for senior students were conducted on mangrove ecosystems, uses of mangroves, threats and conservation methods.

*(b)* Field visits were made to familiarize students with mangrove plants.

*(c)* Students were trained to develop and implement simple research projects on mangrove ecosystems.

*(d)* Students were taken on study tours to Kiralakele Mangrove Information Centre, Rekawa Mangroves and Ussangoda plateau (archaeological site).

*(e)* Two exhibitions on the importance of, and threats to, the RUK area were held at Ambalantota Maha Vidyalaya and Baminiyanwila Jayanthi School, in June and December 2009 respectively.

**Achievements:**

- Awareness on mangrove ecosystems among 100 senior and 75 junior students was enhanced; they were trained in writing and implementing project proposals.
- Students' knowledge of ecologically important sites in the vicinity was enhanced.
- Knowledge gathered from project activities was shared with other schools in the area by holding exhibitions.

**What has changed or is likely to change**

A clear message on the importance of, and need for, conservation of mangroves has reached the elders at home through an effective and trusted medium: school children, who are the future custodians of this valuable coastal ecosystem. Communities are now likely to be more amenable to, and appreciative of, measures taken to protect the coastal ecosystems.

Introducing the project to students of Ambalantota Maha Vidyalaya (Courtesy Visura Development Foundation)

Exhibition (Courtesy Visura Development Foundation)

## 3.3 Educating and enabling border communities to monitor and correct any adverse changes in the Maduganga ecosystem

**Location:** Maduganga, on the south-western coast of Sri Lanka

**Background**:

Lanka Jathika Sarvodaya Shramadana Sangamaya is one the largest NGOs in Sri Lanka having grass root links with about 15,000 villages all around the country. It works with people, encouraging them to come together and share their own resources, to address the needs of the community and bring about self-reliance, not only for the individual but also for the community.

Lanka Jathika Sarvodaya Shramadana Sangamaya (Sarvodaya) works closely with the community in Maduganga. In the process, Sarvodaya observed two serious problems:

- Although adverse changes are taking place in the Maduganga ecosystem, the communities in the bordering areas are either indifferent or unaware of the consequences. These changes arise largely from their own day-to-day and occupational activities.

- The communities lack the ability to identify, measure and keep track of the changes occurring in their environment, which includes Maduganga itself.

Sarvodaya felt the best way to overcome these problems was to educate the community and school children bordering the wetland and the river and thereby gain their cooperation to conserve this ecosystem. Their second objective was to provide knowledge and training to selected teams of students (and others with a science education) to monitor and keep records of selected ecosystem parameters that signal possible threats to the Maduganga ecosystem. The NGO secured a grant to implement its plan of action.

**Interventions**:

*(a)* Environmental education programmes for neighbourhood communities

A total of eight programmes were held: 3 programmes in March,and one each in February, July , October, November and December. About 550 community members from Galmanduwa, Pathegama and Maduwa islands attended these programmes. They were made aware of the importance of the mangrove ecosystem and were also trained in different aspects of mangrove replanting such as selecting areas for rehabilitation, transferring poly-bagged seedlings to soil, determining the optimum spacing between seedlings and between seedlings and the water line.

*(b)* Mangrove replanting using *Rhizophora mucronata*

About 850 mangrove propagules were planted in July (in Galmanduwa), October (in Maduwa), November (in Pathegama) and December 2009 (in Galmanduwa).

*(c)* Environmental education programmes for students on the Maduganga wetland

A total of six programmes were held from March to August attended by 87 students. The first three were field work sessions in Galmanduwa, Maduwa and Pathegama islands. The students received worksheets to record the progress of plants and other observations. The children were expected to share their findings with elders so that the whole community will be kept informed.

*(d)* Sarvodaya Multi Purpose Community Centre Water Testing Facility, in Ambalangoda

The Water Testing Facility was equipped with glassware, chemicals, a refractometer, a pH meter and basic furniture to conduct a simple analysis of water samples. The facility was opened to the public in August 2009 and the students were able to study selected environmental parameters to asses the status of the wetland.

*(e)* Posters and handouts

Posters and handouts on topics related to Maduganga ecosystem were printed and distributed. “Fisheries activities in Maduganga and mangroves” and “The rare mangrove species: *Lumnitzera littorea”* were two of them.

**Achievements:**

- Knowledge of the Maduganga wetland has been enhanced among selected elders and youth of the communities in Galmanduwa, Pathegama and Maduwa islands.
- Knowledge of wetland ecosystems has been enhanced among students in Ambalangoda and Balapitiya.
- Students have gained free access to water testing facility to test water samples and ascertain possible threats and changes to the wetland.

A poster

**What has changed or is likely to change**

Both the youth and the elders in the bordering communities have appreciably enhanced their knowledge of the Maduganga wetland ecosystem and its importance.

The communities have been enabled with the necessary skills and facilities to monitor the adverse changes that may occur in the wetland. Happily, the students have taken the lead and are engaged in constantly monitoring the changes in a scientific manner.

A sound platform is now in place to facilitate efforts to conserve Maduganga for future generations.

Students testing water samples (Courtesy Lanka Jathika Sarvodaya Shramadana Sangamaya)

## 3.4 Renovating a Mangrove Education Centre

**Location:** Maduganga, on the south-western coast of Sri Lanka

**Background:**

Nagenahiru Foundation a leading NGO in Ambalangoda, a coastal town in southern Sri Lanka, has been engaged in education activities for many decades. Educating coastal resource users and school children, and involving them in protecting the Maduganga RAMSAR site through combining "Knowledge and Action" is one of the many services they provide. These "Knowledge and Action" sessions, which attract over 1000 participants annually, are held at their Mangrove Education Centre in Pathemulla. The sessions were conducted in a temporary structure which was in a poor state at the time the Foundation received a small grant from the MFF programme.

**Interventions:**

Pathemulla Mangrove Education Centre building was renovated; the corrugated zinc sheets that had been used for the walls and roofing were replaced with bricks and Asbestos sheets, respectively.

**Achievements**:

As one of the many activities of the project, Nagenahiru Foundation restored the old Centre and converted it to a permanent structure.

Information centre – before (Courtesy Nagenahiru Foundation)


Information centre – after (Kumudini Ekaratne)

**What has changed or is likely to change**

The shed built out of corrugated zinc sheeting in which the educational programmes were conducted has been renovated into a brick-walled permanent structure. The students and visitors now have a comfortable environment for learning.

The improved Pathemulla Mangrove Education Centre will now be able to cater to the future generation of Ambalangoda.

## 3.5 Enhancing the Maduganga area primary school children's knowledge of mangrove ecosystems by training their teachers

**Location:** Maduganga, on the south-western coast of Sri Lanka

**Background:**

The current curriculum for primary school children (Grade 1-3) includes environment related topics. However, due to the lack of proper training and guidance for teachers, these efforts fall far short of the expected outcome. Recognizing this limitation, The Ecocare Centre for Environmental Education and Conservation (ECO-CEN) stepped in to assist primary school teachers, in selected schools in Balapitiya and Karandeniya Education Divisions in Galle District, by providing them with a refresher course and training tools.

**Interventions:**

*(a)* The proposed project activities were introduced to the Zonal Education Offices in the Balapitiya and Karandeniya Education Divisions to obtain their concurrence and approval.

*(b)* Based on information provided by the Zonal Education Offices, 26 schools (12 in Balapitiya and 14 in Karandeniya Education Divisions) were selected for a preliminary survey.

*(c)* After a discussion with the Principal, a questionnaire was administered at each of the 26 schools seeking information such as distance to Maduganga wetland, number of students in primary classes, availability of audio visual equipment such as a Television set, DVD player etc. and the educational background of primary school teachers.

*(d)* After scrutinizing the completed questionnaires, 10 schools in Balapitiya and 12 in Karandeniya Divisions were selected as beneficiary schools. The Principal of each school nominated a teacher to function as the focal point for project matters.

*(e)* A preliminary workshop for the nominated teachers was held on 11 and 12 March, 2009. The topics covered ranged from mangrove ecosystems, water quality, flora and fauna of Maduganga and environmental health issues. The Environmental Committee of the Sri Lanka Association for the Advancement of Science assisted in conducting the workshop, which concluded with a field visit to Maduganga.

*(f)* Teachers were selected to serve as resource personnel to develop a Teacher's Guide on Mangrove Habitats. A team of 12 teachers led by a former head of a Teacher Training College carried out the task in line with the guidelines of the National Institute of Education.

*(g)* A Teacher's Aid - a set of two CDs was prepared. The CDs contained information on the mangrove ecosystem, laws related to mangrove habitats and a directory of institutions dealing with mangroves, including contact details.

*(h)* A set of four CDs - on mangrove flora, mangrove fauna, uses and threats to mangrove habitats, and on folklore - was prepared to serve as an educational tool. The CDs were prepared with inputs from the Department of Agriculture, Turtle Conservation Project, Coconut Cultivation Board, National Design Centre, National Crafts Council and from individual experts;

**Achievements:**

- The Teacher's Aid was distributed to all 54 schools in Karandeniya and Balapitiya Education Divisions
- The Teacher's Guide was made available to the 22 beneficiary schools
- Educational tools were made available to the 22 beneficiary schools

Teacher's guide

**What has changed or is likely to change**

The primary school teachers in the 22 beneficiary schools are now better equipped in terms of environmental knowledge, teaching skills, and teaching aids and tools. Teachers will now approach their classes with greater enthusiasm and confidence; both students and teachers will enjoy the experience.

Balapitiya and Karandeniya Education Divisions now have a pool of primary school teachers well-versed in teaching environment-related topics, and in producing teaching guides and educational tools. They can be deployed to assist the 32 schools that were not covered by the project.

Before long, school children in the Maduganga area will have a sound foundation to develop a good understanding of environment related issues. Their thorough knowledge of the Maduganga wetland ecosystem and its importance, will motivate and enthuse them to protect and conserve their heritage.

# 4. Livelihood Enhancement

Enhancing livelihoods of the coastal communities was the aim of 15 projects (37% of the small grants awarded). The projects were distributed over all six prioritized geographical areas. Their aim was to be achieved by fisher families engaging in activities such as agricultural pursuits, handicraft production, ecotourism, aquaculture, and rearing livestock. A sample of selected projects is described in this chapter.

## 4.1 Enhancing incomes of fisher families through *Aloe vera* (medicinal aloe) cultivation

**Location:** Puttalam, on the north-western coast of Sri Lanka

***Aloe vera* plantation (Kumudini Ekaratne)**

**Background:**

Puttalam lagoon in the north-western coastline of Sri Lanka is noted nationally for fin-fish and crustacean fishery. The lagoon resources are utilized by over 3,000 fishermen belonging to 28 registered fishery societies. Hence, the pressure on the natural resources of the Puttalam lagoon is considerable, mainly due to over-fishing. The introduction of supplementary income generation activities, especially for the womenfolk, was considered a feasible approach to reduce fishing pressure.

*Aloe vera* is a multipurpose plant, providing medicine and drink. The plant has an interesting form and succulence. The succulence helps it to thrive under low moisture conditions. *Aloe vera* yields two products: gel and latex. *Aloe vera* gel comes from the mucilage in the inner leaf tissues, whilst the latex, commonly referred to as "aloe juice," is a bitter yellow exudate from the tubules just beneath the outer skin of the leaves.

Aloe gel is the base for soaps, body lotions, skin care products, foot creams and many modern cosmetics and is reported to possess antiseptic properties. The latex is a well known laxative. In recent times, the demand for *Aloe vera* products has increased both locally and internationally.

*Aloe vera* thrives well under dry, sandy conditions in the environs of Puttalam lagoon. Wild collection from the Puttalam area has been utilized for soaps, body lotions, foot creams and skin care products by many cosmetic producers in Sri Lanka. A grantee of the MFF Small Grants Programme, Marine and Coastal Resources Conservation Foundation (MCRCF), an NGO in Kalpitiya, launched a programme to cultivate *Aloe vera* in the homesteads of 15 selected fisher families.

The objective of this project was to provide another income generation activity to the fisher families. MCRCF implemented the project in collaboration with three fisheries societies in the area: Semuthu Fisheries Cooperative Society in Kudawa and St. Sebastian Fisheries Cooperative Societies in Kudawa and Anawasala.

**Interventions:**

*(a)* Two awareness programmes to introduce the project to the fishing communities were conducted during the first week of February 2009. A total of 37 fisherwomen, 17 from Kudawa and 20 from Anawasala participated.

*(b)* The following criteria were adopted to select beneficiaries:

- Willingness to participate in the project
- Availability of arable homestead land, at least 125 m² each
- Availability of water for irrigation

Office bearers of the three fisheries societies in Anawasala and Kudawa helped in selecting the beneficiaries.

*(c)* Fifteen beneficiaries (12 from Anawasala and 3 from Kudawa) were selected and trained in *Aloe vera* cultivation techniques in mid February.

*(d)* The two main requirements for successful *Aloe vera* cultivation are a regular water supply and a shaded area in the home garden. After an assessment of the adequacy of these basic requirements with the beneficiaries, eight were provided with water supply accessories and seven with shading material. All 15 were provided with 750 kg each of cow dung.

*(e)* Beneficiaries were provided with healthy *Aloe vera* plantlets, purchased from two selected suppliers. Each beneficiary received about 575 plantlets.

*(f)* Planting was completed by the first week of March 2009.

*(g)* Each beneficiary received 2 kg of urea and 2 kg of a granular fertilizer for top dressing. However, future plantings will rely mostly on organic manure.

*(h)* Beneficiaries were trained in post-harvest techniques with a practical session at a plantation site in end May. Individual guidance was also given at the time of harvesting.

*(i)* MCRCF implemented a buy-back system for the beneficiaries' *Aloe vera* harvest. Following discussions with potential buyers MCRCF contracted a leading cosmetic company in Sri Lanka to purchase all the *Aloe vera* produced by the beneficiaries.

*(j)* MCRCF facilitated the collection and transport of *Aloe vera* to Colombo. The sales proceeds, less costs incurred by MCRCF, are remitted to the beneficiaries.

**Achievements**

- Fifteen fisherwomen were trained in *Aloe vera* nursery maintenance, planting out and aftercare of plantations, and post harvest techniques. As one beneficiary left the project prematurely, due to personal reasons, the total number of beneficiaries was 14.
- A successful buy-back arrangement with MCRCF is in operation.
- There were four harvests from June to October amounting to a total of 3,117 kg (Table 4.1).
- Five out of the 14 beneficiary families received more than LKR 10,000 from sale of produce. The highest earner received LKR 21,555 or about LKR 5,300 per month, which is very significant being in addition to the

income from fishing. The income from *Aloe vera* of the 14 families totaled LKR 128,277.72 during this period or about LKR 32,000 per month.

- Given the significant income generation from this activity, some fishermen have also taken to the cultivation of *Aloe vera*.
- Following the successful completion of the project, MCRDF received a second grant to expand the project to another 15 households.

**Harvesting *Aloe vera* (Kumudini Ekaratne)**

***Aloe vera* ready to be dispatched to the buyer (Kumudini Ekaratne)**

**What has changed or is likely to change**

- The monthly income of the beneficiary fisher families has increased by 26%.
- Fishing has decreased by 5% thus reducing fishing pressure on the Puttalam lagoon.
- The cosmetic company does not engage in wild collection of *Aloe vera* any more, which conserves the biodiversity of the area.
- More fisher families are taking to the cultivation of *Aloe vera* as a source of supplementary income.

## Table 4.1- *Aloe vera* cultivation – Harvest and income details (source: MCRCF)

| Beneficiary | Harvest #1 | | Harvest #2 | | Harvest #3 | | Harvest #4 | | Total income LKR/ beneficiary | Average Monthly Income |
|---|---|---|---|---|---|---|---|---|---|---|
| | kg | LKR | kg | LKR | kg | LKR | kg | LKR | | |
| 1 | 88.5 | 3,601 | 207.6 | 8,788 | 117 | 4,886 | - | - | 17,275 | 4,319 |
| 2 | 80.75 | 3,286 | 174.5 | 7,387 | 147.2 | 6,147 | 68.3 | 2,630 | 19,449 | 4,862 |
| 3 | 49 | 1,994 | 104.9 | 4,440 | 114 | 4,761 | 12.2 | 470 | 11,665 | 2,916 |
| 4 | 38.5 | 1,567 | 37.5 | 1,587 | 35.6 | 1,487 | 24.7 | 951 | 5,592 | 1,398 |
| 5 | 21.75 | 885 | 58.9 | 2,493 | 43.2 | 1,804 | 47.5 | 1,829 | 7,011 | 1,753 |
| 6 | 20.75 | 884 | 55.8 | 2,362 | 136 | 5,679 | 201.3 | 7,751 | 16,637 | 4,159 |
| 7 | 20.75 | 844 | 22.1 | 935 | 36.7 | 1,533 | - | - | 3,312 | 828 |
| 8 | 18.75 | 736 | - | - | 53.6 | 2,238 | 27.2 | 1,047 | 4,049 | 1,012 |
| 9 | 17.25 | 702 | 61.8 | 2,616 | 76.5 | 3,195 | 58.3 | 2,245 | 8,757 | 2,189 |
| 10 | 17.25 | 702 | 26.1 | 1,105 | 47 | 1,963 | 15.7 | 605 | 4,374 | 1,093 |
| 11 | 13.25 | 539 | 55.3 | 2,341 | - | - | 19.6 | 755 | 3,635 | 909 |
| 12 | 12.25 | 498 | 165.3 | 6,997 | 205.1 | | 142.7 | 5,495 | 21,555 | 5,389 |
| 13 | 7.75 | 315 | 42.2 | 1,786 | 7.5 | 8,565 | 21.2 | - | 2,415 | 604 |
| 14 | - | - | 19.3 | 817 | 22 | 313 | - | 816 | 2,552 | 638 |
| **Total** | **406.5** | **16,541** | **1031** | **43,655** | **1041** | **919** | **638.7** | **24,593** | **128,278** | **32,069** |

* Sale Price

| | | |
|---|---|---|
| First Harvest (June) | - | LKR 40.69/kg |
| Second Harvest (August) | - | LKR 42.33/kg |
| Thirds harvest (September) | - | LKR 41.76/kg |
| Fourth harvest (October) | - | LKR 38.50/kg |

## 4.2 Enhancing incomes of fisher families through handicraft production

**Location:** Rekawa-Ussangoda-Kalametiya and associated areas, on the southern coast of Sri Lanka.

**Background:**

Danketiya, Palathuduwa and Netolpitiya are three coastal villages that were hit by the 2004 Tsunami. This badly affected their fishing activities and the incomes derived from fishing. In order to increase the income of these coastal families who normally depend on fishing, *Wanasarana Thurulatha* Volunteer Society, a CBO in Matara, commenced a training programme in handicraft production using *Pandanus kaida* leaves that are abundant in the area.

**Interventions:**

*(a)* Selection of beneficiaries: Following the introduction of the project, 50 women (15 each from Danketiya and Netolpitiya and 10 each from Palathuduwa and Yayawatte [a tsunami resettlement village]) were selected for training.

*(b)* Training programmes: A qualified teacher conducted five training programmes on processing of Pandanus leaves, dyeing techniques, bag designing and making, and marketing techniques. Once the trainees mastered the basics, new designs were introduced.

*(c)* Supply of raw materials: To assist the trainees to get established in the new business venture, each beneficiary was provided with a monthly supply of Pandanus leaves, dye, cloth, thread, card board and gum for the first nine months.

*(d)* Planting *Pandanus kaida*: To ensure a sustainable supply of leaves, 6,000 plants of *Pandanus kaida* were planted in selected areas of Medilla beach (in Netolpitiya).

**Achievements:**

- Fifty women have been trained in reed-based handicraft production and have established their own business ventures.
- The women are producing a range of items: mats, carry bags for books, vegetables/fruits etc., ladies' handbags, clutch bags and coin purses. Production time varies according to the item; ranges from 3 -7 days.

- The women have found a market for their products in the nearby schools, village fairs, etc.
- The monthly income from handicrafts ranged from LKR 2,000–6,000 per woman.
- Raw materials are being purchased from the profits earned and not on credit; this ensures the sustainability of the venture.
- *Pandanus* has been established on the coastal stretch of Medilla.

**Handicrafts turned out by the beneficiaries (Kumudini Ekaratne)**

**What has changed or is likely to change**

- Fifty women are now gainfully self-employed, on a part-time basis, in handicraft production.
- Average income of their households has increased by 60%.
- The women earn this additional income while fulfilling their household responsibilities, as before. This is possible as they operate from home, and being their own masters, choose their hours of work.
- Pandanus planted on the Medilla beach, as a source of leaves for the handicrafts, will also provide coastal protection

## 4.3 Ecotourism job opportunities as alternatives to harmful livelihood practices in the Rekawa, Ussangoda and Kalametiya (RUK) ecosystem.

**Location:** Rekawa-Ussangoda-Kalametiya and associated areas, on the southern coast of Sri Lanka

**Background:**

Rekawa, Ussangoda and Kalametiya (RUK) are three coastal villages, rich in biodiversity, in the deep south of Sri Lanka. Rekawa is a turtle sanctuary, while Ussangoda plateau is an archaeological site. The interconnected Kalemetiya and Lunama lagoons and their environs abound in bird life. Illegal fishing practices such as dynamiting, felling of mangroves, unregulated animal husbandry practices, turtle egg collection, poaching, coral mining, inland shell mining, and spread of invasive flora mesquite (*Prosopis juliflora*), prickly pear cactus (*Opuntia dillenii*) and lantana (*Lantana camara*), and fauna such as feral dogs and garden snail (*Achatina fulical)* are major threats to this unique ecosystem.

Ruk Diya Eco Holidays is a community-based organization dealing with ecotourism activities in the RUK area. The CBO is managed by a group of local youth who were earlier engaged in harmful livelihood practices such as poaching, turtle egg collection, coral and inland shell mining. They now run a conventional accommodation facility called Ruk Diya Eco Stop and secured a grant from SGP to expand the ongoing activities - to establish a camping site in their land bordering the picturesque Lunama lagoon.

**Interventions:**

*(a)* Locals involved in harmful livelihood practices (the target group) were identified and motivated to get involved in project activities.

*(b)* Programmes were conducted to raise their awareness on the importance of the RUK area.

*(c)* Two camping units were constructed: each unit with a two-storied wooden shelter to house four canvas tents, a toilet, camp beds and basic camping furniture.

*(d)* The campsite was promoted through a leaflet, posters on notice boards and Southern Area Tourism Authority.

**Achievements:**

- Two sets of well-appointed camping units are now operational.
- Eco Stop earns a monthly income of LKR 30,000 by renting out the campsite and providing home-cooked meals to visitors.
- To service the camping facility Ruk Diya Eco Stop has employed a few members of the target group and diverted them from harmful livelihood practices.

Camping unit (Kumudini Ekaratne)

**What has changed or is likely to change**

- Ruk Diya Eco Stop has expanded the services it provides for visitors.
- Much needed camping facilities with safe ecotourism practices and good hygiene are now available for visitors to the RUK area.
- Identifying the individuals comprising the target group, motivating them by raising their awareness on the importance of the RUK area, and providing employment for a few of them, is likely to reduce the harm caused to this unique ecosystem.

## 4.4 Aquaculture

### 4.4.1 Farming seaweed *Eucheuma* spp as an alternative livelihood for coastal communities at Panama and Pottuvil

**Location:** Panama and Pottuvil, on the south-eastern coast of Sri Lanka

**Background:**

Seaweeds, apart from being used as food, are important sources of colloids or gels such as agar, as well as minerals of medicinal importance such as iodine. *Eucheuma,* a red alga, is a valuable source of carrageenan (polysaccharide gel), an important industrial compound used in stabilizing and improving the quality of many products. *Eucheuma* spp is cultivated for extraction of carrageenans used in confectionery and in a variety of other industries. South-east Asia is one of the largest producers of carrageenans through extensive cultivation of this marine algae.

Demand for carrageenan is steadily rising. In Sri Lanka, many confectionery manufacturers are interested in obtaining their requirements of carrageenan locally, and the demand is expected to increase. However, currently, there is no organized seaweed cultivation in Sri Lanka.

Sewalanka Foundation, a leading NGO in Sri Lanka, secured a small grant to start a pilot seaweed culture initiative. The main objective was to uplift the living standards of coastal communities by ensuring sustainable use of marine and coastal resources through the establishment of a seaweed industry as an eco-friendly livelihood activity. In this activity, the seaweed *Eucheuma* spp (Family: Solierieceae,) was cultivated in cages in the seas off Panama and Ullei (in Pottuvil) in the east coast of Sri Lanka. This is a novel project, as seaweed culture is not well-known in Sri Lanka.

The Sewalanka Foundation worked in collaboration with two fisher cooperative societies (FCS), namely, the Abeysinghapura-Panama Fisheries Cooperative Society and the United Deep Sea Fisheries Cooperative Society in Pottuvil.

**Interventions:**

*(a)* Selection of beneficiaries: Six members, three each of the Abeysinghapura-Panama Fisheries Cooperative Society and the United Deep Sea Fisheries Cooperative Society in Pottuvil were selected by the respective fisheries societies. The main criterion for selection was the commitment and interest to implement the new venture;

*(b)* Selection of sites was based on the following criteria;

(i) Unpolluted water
(ii) Salinity of 30-35‰
(iii) Water temperature of 27-30º C
(iv) Moderate wave action (20-50 m/min)
(v) Depth of 0.5-1 m at low tide and less than 2-3 m at high tide

Based on the above criteria, seas off Panama and Ullei were selected by the beneficiaries and the consultant to the project.

*(c)* Awareness raising: The project was introduced and the beneficiaries were trained in seaweed culture including cage construction, stocking, post-harvest handling, processing and marketing at Panama and Ullei in February 2009;

*(d)* Materials were purchased and 60 cages (2 m x 1.25 m x 0.5 m) were constructed, by the beneficiaries, for stocking seaweed (see Box 4.1 for details);

*(e)* Stocking of cages: Vegetative cuttings were used for propagation. Initially two cages were installed in Panama in March and each cage was stocked with about 4 kg of mother plants. These cages were exclusively for propagation. The cuttings from these two cages were used to stock the balance 58 cages from April to July;

*(f)* First culture cycle: By the first week of August 2009, all 60 cages (30 each at Panama and Ullei) were installed and stocked with vegetative cuttings. Each cage was stocked with about 4 kg of vegetative cuttings;

*(g)* Stocked seaweeds were inspected regularly. Undesirable seaweeds which would compete with the *Eucheuma* for nutrients and sunlight were removed along with dirt and other foreign matter clinging to the seaweeds. Lost or damaged *Eucheuma* were replaced;

*(h)* Harvesting: Seaweed was harvested at the end of the first culture cycle in end September and first week of October. Harvesting was staggered due to staggered stocking. About 200 kg of seaweed was retained to stock cages for the second culture cycle;

*(i)* Harvested seaweed was sun dried and packed for sale in the local market.

*(j)* All 60 cages were stocked for the second culture cycle during the first week of October with the mother plants retained from the first harvest;

*(k)* Second harvest was done in November 2009. All cages were harvested except four retained as mother plants for the third culture cycle.

Box 4.1: Facts about seaweed culture

Floating cages:
The cage measured 2 m x 1.25 m x 0.5 m. Its frame was turned out of 2.5 cm diameter PVC pipes and covered over with 2.5 cm re-inforced plastic netting. Each cage has 5 strands of 6 mm nylon rope (monolines) fixed 20 cm apart, and running parallel to the long axis of the cage. The cages were anchored together using 9 mm ropes.

Stocking method:
Seaweed is vegetatively propagated. Seaweed cuttings taken from healthy 'plants' were tied into bunches with 3 mm nylon thread; each bunch weighed about 75-100 g. The bunches were then fixed to the monolines in the cages, at 20-25 cm intervals. The plants are harvested when they have grown to about 1 kg, or so.

Harvesting:
The whole plant is harvested; actively growing portions are separated and reserved as cuttings to raise the next crop.

Drying:
Rest of the harvest is spread on a platform for sun drying. The platform is made of bamboo slats lined with nylon mesh. Foreign matter clinging to the seaweeds is removed.

During hot and sunny weather, it takes about 3-4 days to dry the seaweeds to a moisture content of 30% or less. The dried seaweed is then packed in plastic sacks, for storage in a dry place or delivery to the buyer.

**Achievements:**

- The pilot initiative proved that seaweed *Eucheuma* spp can be successfully cultured in the seas off Panama and Ullei.
- In 2 months, 100 g of vegetative cuttings grew to 1 kg of harvestable seaweed (wet weight).
- About 50-70 kg (wet weight) of seaweed were harvested from a cage, stocked with 4 kg of vegetative cuttings. The dry weight of seaweed is about 10–12% of its wet weight.

- Seaweed was harvested in 6-8 weeks after stocking. Hence 4-5 cycles are possible per year in Panama and Ulle, even after avoiding the monsoon season.

- Income of fisher families increased by about LKR 2,000 per month.

A cage stocked with *Eucheuma* spp (Kumudini Ekaratne)

Fresh seaweed, dried seaweed and a dessert from it (Kumudini Ekaratne)

**Table 4.2 – Seaweed harvested and income realized from the first culture cycle**

| | Panama | Ullei |
|---|---|---|
| Number of cages | 30 | 30 |
| Dry weight* of seaweed harvested (kg) | 295 | 227 |
| Total income in LKR** | 14.750 | 11,350 |
| Income per beneficiary in LKR | 4,916 | 3,783 |

* Wet weight records are not available
** Sale price of seaweed was LKR 50.00 per kg

**Problem encountered:**

In the second culture cycle the harvest of 56 cages had to be discarded due to spoilage. The harvest was drenched by heavy rain while being dried.

**What has changed or is likely to change**

Seaweed farming provides a fresh opportunity for fishermen to increase their supplementary income. Expanding the project will reduce the fishing pressure in Panama and Ullei.

Panama seaweed farming project has 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".

### 4.4.2 Cage culture of sea bass *(Lates calcarifer)* and Tilapia *(Oreochromis* spp*)* as an alternative livelihood for fishing communities around Maduganga estuary

**Location:** Maduganga, on the south-western coast of Sri Lanka

**Background:**

Fishing communities living around Maduganga RAMSAR site have experienced falling fish catches and consequently, incomes. This no doubt has been a major concern to the communities and has led to their resorting to unsustainable fishing practices, as well as over-fishing. The communities, represented by Ampe *Mithuru* Freshwater Fisheries Cooperative Society Ltd. and Sewalanka Foundation, a Non-Governmental Organisation working in the area, felt that cage culture might be an appropriate way to increase incomes and also to introduce sustainable management practices.

Different methods of aquaculture are practiced in Sri Lanka. The commonly cultured fin-fish species are Tilapia (*Oreochromis* spp) and milkfish (*Chanos chanos*). Recently, several attempts to cage culture sea bass (*Lates calcarifer*) have been successful. Fresh and brackish water prawn species have also been cultured.

Considering the novel and varied experience of the Sewalanka Foundation and the profitability demonstrated in pilot scale cultures, sea bass (*Lates calcarifer*) was chosen for piloting cage culture in Maduganga. Sea bass, also commonly known as barramundi or giant sea perch, is an euryhaline species found in

the Indo-Pacific region. The fish, with its delicately-flavoured flesh, has a big demand in European Union countries, USA and in Asia, and therefore fetches high prices. Having many qualities required for aquaculture such as a fast growth rate, ability to grow well in turbid water, tolerance to salinity variation from 0 to 35%, ability to withstand crowded conditions and rough handling, and attaining marketable size within 4-6 months, sea bass is farmed/cultured in many countries such as Thailand, Malaysia, Indonesia, Singapore, Hong Kong, Taiwan and more recently, Australia. Sea bass is farmed in both brackish and freshwater ponds or in net cages (cage culture) in coastal waters, with the latter being predominant. Fingerlings (young fry) are introduced to net cages and are initially fed with formulated pellet feed. As the fingerlings grow, trash fish is gradually introduced to their regular meals. In Sri Lanka, sea bass cage culture is presently practiced in lagoons in Negombo, Nawalady and Kinniya.

Maduganga, a RAMSAR site, is a brackish water system in the wet zone lowlands in south-west Sri Lanka. As the water quality is ideal for sea bass culture, and this species is naturally found in Maduganga, a pilot project on sea bass cage culture was introduced by Sewalanka Foundation through a small grant. The project was implemented through the members of the Ampe *Mithuru* Freshwater Fisheries Cooperative Society Ltd. The floating cages did not cause any obstruction to water flow, and the material used to construct cages was not harmful to the lagoon system. Fish culture was expected to reduce the pressure of capture fishery.

**Interventions:**

*(a)* The novel project was introduced to the members of the Ampe *Mithuru* Freshwater Fisheries Cooperative Society Ltd. This was followed by selection of four beneficiaries based on selection criteria such as commitment and willingness to undertake project activities.

*(b)* An Aquaculturist trained the beneficiaries in cage construction and sea bass cage culture related activities.

*(c)* An appropriate site was selected based on water quality parameters such as salinity (5-15‰), pH (7-8) and depth (minimum 3 m).

*(d)* Eight floating net cage units (each 3 m x 3 m x 2 m = 18 $m^3$); four with mesh size of 1 cm (for fingerlings) and four with mesh size of 2.5 cm (for grown fish) were constructed and installed in the Maduanga estuary (see Box 2 for details). In order to provide security, the beneficiaries took turns to stay in the hut built at one end of the floating structure.

*(e)* First culture cycle: The four 1 cm mesh size cages were stocked with 1,600 of 60-75 days old sea bass fingerlings in April 2009 (stocking density = 25 fingerlings per $m^3$).

- Fingerlings were fed, at the rate of 6% of their body weight during the first six weeks, with commercial pellet feed (Protein 39%, Fat 7.0%, Fibre 4.0%, Ash 11.07%, Methionine 0.77%, Calcium 2.5%, Phosphorus 1.2%). Trash fish was gradually introduced and after two months the feed rate was reduced to 4% of their body weight. Fish were fed twice a day

- The basic water parameters such as salinity, surface dissolved oxygen, surface turbidity, temperature and pH were monitored on a regular basis

- The fish were graded under the supervision of the Aquaculturist in May 2009*. The graded fish were kept in the 1 cm mesh cages, grouped according to their size

- After a second grading under the supervision of the Aquaculturist, in mid August 2009, the fish over 250 g were transferred to grow out cages (2.5 cm mesh size).

- Fish of the first cycle (sea bass) were harvested after 5.5 months on 10 October 2009.

*(f)* Second culture cycle: The vacant small mesh size cages were stocked in mid August 2009. Due to non availability of sea bass fingerlings, the cages were stocked with tilapia (*Oreochromis* spp). Two thousand fingerlings were stocked (stocking density = 55 per $m^3$).

- Fingerlings were fed at the rate of 6% of their body weight during the first month with commercial pellet feed (Protein 39%, Fat 7.0%, Fibre 4.0%, Ash 11.07%, Methionine 0.77%, Calcium 2.55, Phosphorus 1.2%) and then reduced to 4% of their body weight. The fingerlings were then introduced to farm prepared fish meal (soya bean, wheat flour, rice bran, mineral and vitamins, fish oil). Feeding regime was twice a day.

- Tilapia of the second cycle were harvested in stages from 28 December, 2009 to 8 January, 2010 since it was difficult to find a buyer to take the entire stock at once.

* The total fish count was only 875, whereas 1,600 were stocked and the cause for this reduction was investigated. Poaching, escape from cages, and death due to unsuitable water conditions, were ruled out. Examination of fish samples revealed a parasitic infection due to *Trichodina* spp (parasitic protozoan). Appropriate control measures were taken.

Box 4.2 – Floating cages

Each floating unit is comprised of a net cage (3 m x 3 m x 2 m) suspended from a floating raft anchored to the estuary bed. The frame of the raft is made of treated timber. The cages were made of polyethylene netting of two mesh sizes: 1.0 cm and 2.5 cm. The small mesh net cages were for rearing fingerlings and the larger mesh net cages ("grow out cages") were for grown fish. Net cages had a depth of 2 m, with 1.5 m immersed in the water. The rafts were kept afloat with plastic drums. Anchors were placed at the four corners and mid-position of the raft. The length of each anchor rope was about four times the depth of water.

**Table – 4.3 Sea bass harvested and income realized from the first culture cycle**

| Cage number | No. of fingerlings stocked | No. at time of harvest | No. harvested | Harvested weight (kg) | Income* In LKR |
|---|---|---|---|---|---|
| 1 | 400 | 234 | 234 | 143.0 | 35,750 |
| 2 | 400 | 254 | 253 | 127.0 | 31,750 |
| 3 | 400 | 213 | 211 | 94.5 | 23,625 |
| 4 | 400 | 174 | 165 | 63.5 | 15,875 |
| **Total** | **1600** | **875** | **863** | **428.0** | **107,000** |

* sale price of sea bass was LKR 250.00 per kg)

**Achievements:**

- The test run proved that sea bass and tilapia can be cultured in cages in the Maduganga estuary.
- First harvest of 428 kg of sea bass fetched LKR 107,000/=
- First harvest of 682 kg tilapia fetched LKR 136,400/=

**Problems encountered:**

- Sea bass fingerlings were not available for the second culture cycle and had to be substituted with tilapia.
- Sea bass was subject to a parasitic infection (*Trichodina* spp) that killed almost half the stock.
- Tilapia had to be harvested in stages as it was difficult to find a buyer to take the entire stock, at once.

Cage unit (Kumudini Ekaratne)

Harvested sea bass (Ranjith Mahindapala)

**What has changed or is likely to change**

Technology for intensive culture of finfish has been transferred to the traditional fishermen in Maduganga. Income from sea bass cage culture per fisherman per cycle (5.5 months) is LKR 26,750/= and from tilapia cage culture per fisherman per cycle (about 4 months) is LKR 34,100/=. The success of the pilot intervention led to another small grant for Sewalanka Foundation to expand the project to include four more beneficiaries. The aquaculture practice has reduced pressure on capture fishery.

This 'experiment' and its success has prompted the government to provide 100 cages to the Ampe Mithuru Freshwater Fisheries Cooperative Society – leveraging funds from another source for expansion. A convincing demonstration can influence government plans.

## 4.5 Animal husbandry

Pottuvil is a town on the east coast of Sri Lanka, which was affected by the long–drawn-out civil unrest and the 2004 Tsunami. The Muslim community constitutes the vast majority of its population; their main livelihoods are fishing, and small business enterprises including tourism and livestock rearing. Three grants were awarded for livestock rearing projects to empower widows and women-headed families.

### 4.5.1 Goat farming to enhance the income of widows and their families in Pottuvil

**Location:** Pottuvil, on the south-eastern coast of Sri Lanka

**Backgound:**

Goat farming, mainly for meat, is widely practiced in the Pottuvil area. Al-Ameen *Samurdhi* Society received a small grant to establish a goat farm in Pottuvil. The beneficiaries, eight women from fisher families, performed the day-to-day activities in the farm on a roster basis.

**Interventions:**

*(a)* Al-Ameen *Samurdhi* Society, in concurrence with Pottuvil's Divisional Secretary, selected eight widows as the beneficiaries.

*(b)* The land was cleared of undesirable vegetation and a live fence was erected around the farm.

*(c)* A farm office, toilet, shelter for the goats and a well was constructed.

*(d)* Twenty-eight goats, certified by the Government Veterinary Surgeon, were purchased.

**Achievements:**

The goats are multiplying and the herd has increased from 28 to 43 within a period of six months.

Goat farm (Kumudini Ekaratne)

**What has changed or is likely to change**

- A well-managed and profitable goat farm is in operation.
- The beneficiaries are now gainfully occupied on a part-time basis.
- The eight beneficiary women now earn an average monthly income of LKR 2,000/= each.

### 4.5.2 Poultry farming to enhance the income of widows and their families in Pottuvil

**Location:** Pottuvil, on the south-eastern coast of Sri Lanka

**Background:**

The Arugam Bay Tourism Association (ABTA) established a chicken farm on their land in Pottuvil, to uplift the income of 20 widows of tsunami and terrorism affected families in the Eastern Province. As in the goat farming project (4.5.1), the women shared the workload and took turns to perform the routine activities in the farm.

**Interventions:**

*(a)* The project beneficiaries were selected by the Divisional Secretary, Pottuvil.

*(b)* Poultry sheds were constructed and day-old chicks were purchased (500 per cycle).

*(c)* The birds were maintained and their progress regularly monitored by the beneficiaries, under ABTA supervision. The services of the local veterinarian were sought on a regular basis.

*(d)* Matters relating to the sale of broilers were handled by ABTA.

Poultry farm (Kumudini Ekaratne)

**Achievements:**

- A broiler poultry farm which can house about 1,000 birds has been established.
- Two production cycles have been completed with a net profit of LKR 40,000 from the first cycle and LKR 30,320 from the second cycle (Table 4.4).
- Profits were equally divided amongst the 20 families.

**Table 4.4 Profits realized over the first and second cycles of broiler production, in LKR**

| | First cycle (490 birds) | Second cycle (475 birds) |
|---|---|---|
| Income | 236,000 | 221,975 |
| Expenditure | 196,000 | 191,635 |
| Profit | 40,000 | 30,320 |

**What has changed or is likely to change**

- A well-managed and profitable broiler chicken farm is operational.
- Twenty widows are now gainfully occupied, on a part time basis.
- Each widow earns an average income of LKR 2,000/= per cycle.

### 4.5.3 Buffalo farming to enhance the income of widows and their families in Pottuvil

**Location:** Pottuvil, on the south-eastern coast of Sri Lanka

**Background:**

Livestock Development Dairy Farmer Association in Pottuvil was established in 2003. Upliftment of the standard of widows and women-headed families was one of their goals. In 2007, they received 30 buffaloes from GTZ, and in 2008, another 10 from the UNDP Small Grants Programme. The buffaloes are tended by widows. The Association secured another small grant to purchase 16 more buffaloes and assist another eight widows.

**Interventions:**

*(a)* The beneficiaries (eight widows) were selected with the assistance of the Divisional Secretary, Pottuvil and they were introduced to the project.

*(b)* An awareness programme on buffalo rearing was conducted and hands-on training provided by a member of the Association.

*(c)* A shelter was constructed for the buffaloes and a protective fence erected around the farm.

*(d)* Buffaloes were purchased from the National Livestock Development Board (NLDB); local purchase was discouraged.

*(e)* The local veterinarian checked the animals periodically.

**Achievements:**

- Eight widows have been trained in buffalo farming and are now actively engaged in farming activities.
- The animals are confined to the buffalo rearing shelter and the fenced area. This prevents them from straying and facilitates the work of the women.
- All 16 buffaloes were pregnant when they were purchased in end March; some have since calved and the herd increased to 23 by July 2009 when the project ended.
- A satisfactory arrangement to market the milk is in place.
- The average monthly milk production of about 500 litres fetches around LKR 17,000, at LKR 34.22 per litre (Table 4.5).

**Table 4.5 Fresh milk produced and the income realized**

| Month | Fresh milk produced (litres) | Income (LKR) |
|---|---|---|
| April | 478 | 17,921.00 |
| May | 489 | 16,798.26 |
| June | 521 | 17.928.62 |
| July | 524 | 17,601.08 |

**What has changed or is likely to change**

- A well-managed and profitable buffalo breeding unit is operational.
- Eight widows are now gainfully occupied, on a part time basis.
- Each widow now earns an additional monthly income of LKR 1,000.
- The Association has leveraged funds from other sources to set up a milk processing facility. This will provide employment to several others in Pottuvil.

Buffalo farm (Ranjith Mahindapala)

## 4.6 Home gardening

Fisher families were introduced to agriculture through six small grants projects. Agriculture was a novel experience for them. Women in the fisher families were trained and assisted in cultivating their homesteads with vegetables as well as perennial crops to provide food, and additional income from the sale of surplus produce. A few of these projects are described below.

### 4.6.1 Training and supporting the Sothupitiyawadiya community to establish thirty home gardens near Puttalam lagoon

**Location:** Puttalam, on the north-western coast of Sri Lanka

**Background:**

Generally, home gardens in Sothupitiyawadiya, bordering the Puttalam lagoon, have highly permeable soils prone to leaching and shallow water tables. Excessive use of agrochemicals in such lands will lead to serious pollution of

both the ground water and the lagoon system. Furthermore, soil erosion due to unsustainable agricultural practices has accelerated silting/sedimentation of the lagoon. Household waste is also directly dumped in the lagoon aggravating the situation. In order to address all these issues, Sewalanka Foundation undertook a project to establish 30 organic home gardens in Sothupitiyawadiya through a small grant. The project activities were implemented through *Nirmala Matha* Society, an active women's group from the area.

**Interventions:**

*(a)* The project was introduced to the members of the *Nirmala Matha* Society in February 2009 and 30 of them were selected as beneficiaries.

*(b)* Awareness and training programmes were conducted, by the local Agricultural Extension Officer of the Department of Agriculture, on organic fertilizer preparation, mulching and liquid fertilizer preparation, and worm culture techniques (March-June).

*(c)* Organic home gardens growing green chillies, brinjal, ladies fingers, mango, pomegranate, cashew, coconut and teak plants were established.

*(d)* Visits to *Govi Jana Seva* model farm in Pallivasalthurai and Sewa Lanka's ILANDA facility in Rajanganaya were arranged for the beneficiaries to gain practical experience.

*(e)* The household solid waste issue was addressed by training beneficiaries on compost making (pit, heap and live cage methods), and preparing organic liquid fertilizers using waste materials such fish waste.

*(f)* The home gardens were subjected to periodic monitoring and evaluation.

**Achievements:**

- The 30 organic home gardens are flourishing and producing vegetables and fruits
- Solid waste management practices have been adopted by the 30 beneficiary families.

Home garden in Sothupitiyawadiya (Kumudini Ekaratne)

**What has changed or is likely to change**

- Thirty members of *Nirmala Matha* Society are now engaged in a satisfying and rewarding green pastime – organic home gardening.
- Families of the beneficiaries now enjoy a regular supply of homegrown, pesticide free fruits and vegetables.
- Sale of surplus produce brings an additional income to the beneficiaries.
- The Sothupitiyawadiya community has access to a source of reasonably priced, homegrown, pesticide free fruits and vegetables
- The solid waste management practices, adopted by the beneficiaries, not only ensure a supply of organic manure but also help to reduce lagoon pollution.

### 4.6.2 Training and supporting the Ammathota Fishing Village community to establish fifty home gardens

**Location:** Puttalam, on the north-western coast of Sri Lanka

Home gardening was introduced to selected fisher families in Ammathota Fishing Village in Pallivasalthurai by PEARLS - Peaceful Environment Assured

Right Lasting Solutions, a CBO from the area. This project, planned as an activity to protect Ammathota, was implemented through the *Amma Thottam Janahanda Fishing Women's Guild*, a local society.

**Interventions:**

*(a)* The project activities were introduced to the members of *Amma Thottam Janahanda Fishing Women's Guild* and 50 of them were selected as beneficiaries.

*(b)* The beneficiaries were trained in appropriate agricultural practices by the Agricultural Extension Officer in Pallivasalthurai.

*(c)* Vegetable varieties such as brinjals, snake gourd, bitter gourd, tomatoes, spring onions and green chillies were planted in July 2009. Due to the rather inhospitable soil conditions the beneficiaries were encouraged to practice polybag cultivation. The women also used abandoned kitchen utensils such as pots and pans. A basket compost unit was set up in each garden to provide a regular supply of compost.

*(d)* Beneficiaries were trained in coconut cultivation, in August, by an officer of the Coconut Cultivation Board, and each household received two coconut seedlings.

*(e)* Two model home gardens were established. They were fenced and planted with several vegetable and fruit varieties, pulses such as green gram and cowpea, and leafy greens.

**Home garden in Ammathota fishing village (Kumudini Ekaratne)**

**Achievements:**

- Fifty fisher women with no previous experience in tending plants have been trained as successful gardeners.
- Two model gardens and 50 home gardens have established well, and are in production

**What has changed or is likely to change**

Fifty fisher women are now enjoying their new-found vocation – cultivating their own homesteads, which provides them with a fresh supply of vegetables and pulses, and also brings an additional income from surplus produce.

In view of the multiple benefits, there is a high probability the women will continue to nurture their plots and ensure the sustainability of the venture

### 4.6.3 Training and supporting fisher families in Ussangoda to establish forty home gardens

**Location:** Rekawa-Ussangoda-Kalametiya and associated areas, on the southern coast of Sri Lanka

**Background:**

Forty home gardens of fisher families were developed as one of the activities of a small grant awarded to *Meth Sith* Development Organization, a CBO in Ussangoda.

**Interventions:**

*(a)* The beneficiaries were selected and awareness programmes on agricultural practices were conducted by the Agricultural Extension Officer in the area. A training programme on financial management was also conducted.

*(b)* Beneficiaries were provided with a selection of vegetable seeds and fruit plants to commence cultivation.

*(c)* Each beneficiary received a grant of LKR 5,000 to improve the venture, for example, by diversifying the crop varieties.

Home garden in Ussangoda
(Kumudini Ekaratne)

**Achievements:**

- Beneficiaries' awareness on agricultural practices and financial management was enhanced.
- Forty home gardens have been successfully planted up with vegetables, finger millet, green gram, chillies, onion, cowpea and fruit crops

**What has changed or is likely to change**

- Forty fisher families have been introduced to agriculture, which is a novel experience for them.
- Women in the fisher families have been trained and assist in cultivating their homesteads with vegetables and perennial crops.
- Beneficiary families now have a regular supply of fresh home grown vegetables, fruits and pulses.
- Sale of the surplus produce at the weekly village fair brings an additional income.

### 4.6.4 Training and supporting fisher families in Kattankudy (Batticaloa) to establish twenty banana-based home gardens

**Location**: Batticaloa, on the east coast of Sri Lanka

**Background:**

Kattankudy, famous for traditional Muslim sweetmeats and dubbed as a "sweet town" is located on the east coast of Sri Lanka. Kattankudy, one of the most densely populated towns in Sri Lanka, was badly affected by the 2004 Tsunami. Organization for Protecting and Ensuring Democracy (OPED), an NGO based in Kattankudy, secured a small grant to implement a home garden programme with banana as the main crop. Banana has a high demand in the area. The objective was to enhance the income of fisher families.

**Interventions:**

*(a)* The project was introduced to 20 selected fisher families living in the coastal area.

*(b)* Each family was provided with 50 banana suckers, agricultural implements, compost and fertilizer, sufficient for the first planting, which commenced in mid July 2009.

*(c)* Progress was regularly monitored with the assistance of the Agricultural Extension Officer

**Achievements:**

- Twenty families were trained in banana cultivation.

Banana cultivation
(Kumudini Ekaratne)

- One thousand clumps of banana have been established in the 20 gardens, and are being tended by the beneficiaries. Banana has been interplanted with papaya, pumpkin and cucumber.

- Although the banana plants have only just begun to flower, the beneficiaries are already making some money. They sell banana suckers at LKR 75 each as planting material, and leaves at LKR 3 per leaf to restaurants to wrap food and as improvised plates. Surplus dried banana leaves are also sold to a nearby composting yard at LKR 5 per kilogram, after retaining adequate quantities for home composting.

**What has changed or is likely to change**

- Twenty families in Kattankudy are now skilled in establishing and maintaining banana plantations.
- The cultivation of banana in home gardens in Kattankudy is gaining in popularity.
- The 20 beneficiary families have enhanced their income through the new venture.

# 5. Lessons Learned in the MFF Small Grants Programme

The small grants programme was an abundant source of lessons. Both the project team at IUCN and the grantees are richer by their experiences during the course of the programme, and have enhanced their knowledge. The lessons learned by grantees were shared in four regional lessons learned workshops held in November and December 2009.

This chapter presents the lessons learned from our experiences both at the level of managing the projects and implementing them in the field. The latter were captured at the workshops. These lessons learned are documented with a view to improving future project performance.

**Lessons learned workshop in Batticaloa on 25.11.2009 (Angela Fernando)**

## 5.1 Project management level

### 5.1.1 General considerations

- Small grants of LKR 500,000, steered by local organizations, proved to be quite adequate to successfully complete community level tasks; several projects brought forth replicable results.

Lessons learned workshop in RUK area on 30.11.2009 (Angela Fernando)

- On the other hand, the 12-month project period was found to be inadequate for many projects, especially those relating to ecosystem restoration. Practicalities such as obtaining planting material on time, delayed onset or failure of rains for planting etc. should receive greater consideration.

- Long-term sustainability of the project must be considered from the outset. Introduction of sustainable economic solutions to the communities is likely to increase the success of the enterprise.

- SGP results, occasionally, raised issues that should be examined at a broader level, e.g. the need to develop guidelines on mangrove replanting.

- Mentoring proponents and guiding them in project planning, instead of merely rejecting imperfect proposals, was found to be highly productive and much appreciated.

- Grantees' perception of timelines for projects was often unrealistic; the need for setting realistic timeframes, at the outset, should be emphasized.

- Project cycle management:

    - The introduction to project management tools, as a capacity building approach, was appreciated by the grantees, especially the small organizations.

- Regular field visits and interactions helped a great deal to maintain the tempo of the programme and to develop a close rapport with the grantees.

- Generally, the budget tracking tools introduced worked well; yet there were grantees who required constant coaching. These were mostly organizations managed by one or two persons.

- The IUCN project team's emphasis on output-based monitoring offered a different perspective to the grantees. Soon, they themselves were looking for outputs and sustainability.

- Capacity building of CBOs was found to improve project performance.

- Registration of the proponent organization with an appropriate institution was a pre-requisite to apply for a grant. Evidently, this did not always ensure that the organization had the capacity and wherewithal to effectively manage the project and its funds. Three projects had to be cancelled; in all three cases, the organization was managed by one person, without any internal controls. In another case, when financial

**Box 5.1: Put your house in order – Some Points to Ponder**

A well-established NGO was provided funds to publish an environmental magazine extolling the biodiversity and associated features of an important wetland area, as well as to warn the community of the dangers faced by this unique ecosystem (see page 41). Initially, the magazine was published regularly, but later on the issues did not materialize on time. Investigating these delays, it was found that funds were not made available to the person responsible for publishing the magazine. The NGO reported that the funds had been siphoned off by two of their office bearers.

Further investigations revealed that the NGO had a very poor governance structure. All decisions were taken by one or two individuals, and the bank account was also operated by the same individuals. These issues surfaced only after IUCN queried about the delay in publishing the magazine; even the Executive Committee was not aware of the situation.

Being a long-standing credible NGO the members, collectively, made good the loss, drawing on their personal funds. The NGO is implementing corrective measures to see that incidents of this nature do not recur. This unpleasant experience underscores the need for organizations to have good governance structures and transparency in their operations.

misappropriation was detected, the organization's governing committee took corrective action, including making good the lost monies. Examining the governance structure of organizations, at the inception stage, would be a sound precautionary measure.

- The Lessons Learned workshops not only facilitated the sharing of experiences but also provided grantees with a good opportunity to network and make 'friends'.

### 5.1.2 Ecosystem Restoration

- The communities are able to look after their ecosystems provided they have the necessary wherewithal and backing from the state agencies to deal with impending threats.

- Most grantees would benefit from receiving technical support to select suitable areas/species for mangrove planting. Some plantings were submerged during high-tide and completely destroyed; others planted too far inland. Although communities are generally knowledgeable about *Rhizophora* and *Bruguiera,* they would like to get information on other species and technical guidance.

### 5.1.3 Education and awareness

- In general, the fishers were aware of the importance of mangroves for sustainable fishery, and the coastal communities were receptive to general education and awareness programmes on the value of ecosystems.

- Environmental education should be a continuous effort. Local resources and expertise should be used if it is to be sustainable.

### 5.1.4 Livelihood enhancement/alternate livelihoods

- The benefit of diversifying livelihoods, as a means of reducing excessive pressures on certain ecosystems or resources, was amply demonstrated.

- Initiatives in both aquaculture and agriculture were successful.

- Agricultural pursuits could be effectively introduced to fisher families even though they had no previous experience whatsoever in tending plants.

- Sri Lanka has high potential as a seaweed-farming destination as the environmental conditions are appropriate. Therefore improved techniques for seaweed culture and processing are important. It is evident that a research back-up is essential to address issues brought up by grantees such as reducing the cost of infrastructure and operations.

## 5.2 Project implementation level

### 5.2.1 General considerations:

- Approval of the relevant state agencies and local authorities should be obtained before implementing certain project activities, particularly those related to ecosystems (e.g. mangrove planting). Reporting on the projects at local government level coordination meetings will ensure the cooperation of state agencies, provide the necessary transparency, and also provide opportunities for replication and to attract funds from other sources.

- Winning community support and participation to implement their projects presented a challenging task for several organizations. The following measures were found to be useful in this regard:

  - Providing full information on the project activities and expected outputs, at the very outset; no hidden agenda. Mobilization of the communities is very important. The participation of relevant government officials proved to be useful.

  - Regular motivation was necessary. With proper motivation, it is possible to change the mindset of community members. Introduction of income generating activities also succeeds in getting community participation.

  - When working with local communities, they should be given the responsibility of making decisions; respecting these decisions is also important. If the decisions are obviously flawed, sort out the shortcomings through discussions.

### 5.2.2 Ecosystem restoration

#### *5.2.2.1 Coastal planting*

- Planting should coincide with the rainy season to increase success. A fresh water supply should also be available near the plantation.

- Using a protective cover to reduce the effects of warm winds increased the survival rate of seedlings. The eco-friendly covers made of palmyrah leaves, used by grantees, proved to be effective and long-lasting.

- In a previous coastal green belt programme, a grantee had used concrete posts and barbed wire to fence off the planted areas. This proved very costly and the barbed wire was soon corroded. Learning from this experience, the grantees used wooden poles and live fences (with *Gliricidia)*, which turned out to be cheaper and better.

**Lessons learned workshop in Maduganga on 6.12.09 (Kumudini Ekaratne)**

**Lessons learned workshop in Puttalam on 7.12.09 (Angela Fernando)**

- Bringing about a competitive spirit in the community to care for the coastal plants was found to be very effective. Assigning blocks of newly-planted areas to different groups of women, saw them engaged in healthy competition to ensure after-care of the planted areas.

#### *5.2.2.2 Mangrove planting*

Grantee/Community observations on collecting and/or raising seedlings

- Locally available species should be selected for planting. Introduced species, not normally found in a given ecosystem, were not always successful.

- The availability of planting material should receive serious consideration at the project planning stage. For instance, *Aegiceras* and *Avicennia* seeds are not available in the Pottuvil area, during August and September.

- Nurseries should be established in areas where fresh water is readily available.

- Grantees observed that some species, (e.g. *Hibiscus* and *Cerebus manga)* could be raised in nurseries while others such as *Sonneratia* do not perform well in nurseries.

- *Rhizophora* propagules should be collected at "yellow neck" stage.

Grantee/Community observations on planting and aftercare

- In areas prone to vandalism, mangrove seedlings should be planted in enclosures.

- The distance between two planting points should be 0.9 meters (3 feet) for *Rhizophora* spp and approximately 0.45 meters (1.5 feet) for *Avicennia marina.*

- *Bruguiera gymnorhiza* seedlings do not survive when salinity increases.

- Plants are exposed when the water level falls during the dry season. Consequently, during dry periods, the plants are more likely to be damaged by grazing animals and fungal diseases.

#### *5.2.2.3 Other eco-friendly initiatives*

- Popularizing biogas generators to reduce the use of mangroves as fuel wood was a challenge. Cooking with gas generated from garbage did not appeal to the community. Much effort such as frequent discussions and demonstrations, familiarization visits to other similar facilities, etc., was required to change their mindset. Ultimately, women in fisher families came round and were happy to use biogas; they felt that biogas generated more heat than fuel wood.

- Similarly, fuel efficient stoves were accepted as the women sensed their benefits.

- Fishermen were receptive to new ideas, provided 'mobilization' was adequate. A case in point was the introduction of electric lamps to replace kerosene lamps, for night fishing. They found that electric lamps allow uninterrupted fishing irrespective of the weather; kerosene lamps cannot be used during heavy winds and rain. Since the lamps are charged by a solar panel during the day, the cost was negligible. The fishers also appreciated being free from noxious fumes normally associated with kerosene lamps.

### 5.2.3 Education and awareness

In the light of some individuals proposing that mangroves should be replaced by cash crops, awareness and education programmes on the value and importance of mangroves, were timely and very useful. Some important lessons were:

- School children were the most receptive to awareness raising activities and the best medium to share and spread conservation messages to the larger society.

- It is easy to change the mindset of school children through awareness programmes that highlight the importance of conserving their environment. The change will encourage the students to join and actively participate in environmental conservation initiatives. Understandably, students committed to public examinations will be reluctant to participate when these voluntary activities clash with their private tuition classes.

- A market analysis is desirable before undertaking the publication of a periodical that would depend on sales revenue for its long-term sustainability.

### 5.2.4 Livelihood enhancement/alternate livelihoods

The importance of diversifying livelihoods, in order to decrease excessive pressures on certain ecosystems or resources, was clearly evident. Aquaculture and agriculture were the two areas explored.

#### *5.2.4.1 Aquaculture*

Aquaculture has potential for substantial supplementary incomes for the communities. Some key considerations here are:

- The viability of new aquaculture technologies must be pilot tested before they are transferred to the coastal communities.
- Small-scale intensive aquaculture (cage culture) initiatives may be viewed positively for poverty alleviation, but the communities need to be educated on possible environmental impacts.

**Box 5.2: Fin-fish cage culture - a success story with a not so happy ending**

The achievements of this project (see page 66) are many. The pilot intervention enabled the transfer of technology for intensive culture of fin-fish to the traditional fishermen in Maduganga. Income per fisherman per cycle from cage culture of sea bass (5.5 months) and tilapia (about 4 months) was LKR 26,750 and 34,100 respectively. With these achievements the grantee won another small grant to expand the project to four more beneficiaries, bringing the total to eight. The aquaculture practice reduced the pressure on capture fishery.

Initially, the unity in this eight member group was such that they had their cage units installed next to each other in a row. This enabled them to share the workload by taking turns to feed the fish and provide the much needed round-the-clock security.

It was not long after the project closed things began to go sour. The increasing incomes earned by the beneficiaries spawned envy and brought about disharmony amongst the community members. The grantee had chosen to work with individual members rather than with the Fisheries Society. Nevertheless, the Fisheries Society sought to intervene but may not be with the best of intentions. Unfortunately, the governance structure of the Society was not transparent. The meetings were held in the president's house, rather than in the community hall.

The president's father was the patron of the Society, and since the meetings were held in their house, the patron too was a strong voice at the meetings. Members felt they could not openly discuss issues at these meetings, which were conducted according to the whims and fancies of the president and his family.

Eventually, the members split into two 'groups', one with and the other against, the President. The Society had been formed several years ago under the aegis of the Coast Conservation Department. IUCN took the initiative and brought all parties together in a bid to resolve the issues, but to no avail. The beneficiary fishermen insisted on having the cages separated and managed on an individual basis.

In order to ensure sustainability, the grantee offered to manage a scheme whereby 30% of the income will be retained to fund the purchase of fingerlings and feed for the following cycle. Here again there was no consensus. As a result of this conflict, the only option available was to separate the cages, and let the individuals (or their own groups) continue with the operation.

This is a sad example of a promising pilot project leading to irremediable disharmony among a group of fishermen. It underscores the need to help communities deal with social conflicts that arise from marked disparities in income. Of equal importance is the governance structure of CBOs and similar societies. Conducting their business in a transparent and democratic manner is an absolute must.

- Aquaculture initiatives should ensure, as a prerequisite, a reliable supply of fingerlings (sustainability of sea bass culture was jeopardized by the lack of fingerlings) and reliable markets.

- Marked disparity in incomes within the community brought forth conflicts, sabotage etc. Continuing community mobilization is needed to reduce conflicts arising out of aquaculture farming in common waters.

#### *5.2.4.2 Agriculture*

- Generally, agricultural pursuits could be effectively introduced to fisher families, although a few were reluctant to engage in agriculture.

- Cultivation of *Aloe vera* by fisher families in Kalpitiya was an outstanding success. The input package, consisting of planting material, technology and a marketing scheme, provided to the cultivators was the key to

success. The economic benefits were such that there was voluntary replication, as well as adoption of *Aloe vera* cultivation by others.

- Providing incentives, at the beginning, in the form of planting material and advice, enabled the fisher families to plant their homesteads.

- The considerable effort that was put into train fisher families in basic agriculture paid off. Some of the topics covered were: optimum time of planting to ensure high plant survival, using organic manures to reduce dependency on mineral fertilizers, new techniques such as using potted plants where the garden soil was poor, using *Gliricidia* as green manure, fuel wood or as a support for pepper, and utilizing the limited home garden space in the most efficient manner.

- Fisher families that took to agricultural pursuits started to appreciate homegrown vegetables. As a result, the household consumption of vegetables increased.

**Box 5.3: *Aloe vera* cultivation empowers fisher families in Puttalam**

This project (see page 53) is, arguably, the most successful of the 41 SGP projects implemented in 2009. The commitment of the grantee and the beneficiaries was exemplary. The beneficiaries quickly picked up the skills required for a new livelihood activity and invested time for aloe cultivation while attending to their daily chores. The grantee provided technical advice and planting material to start up the project. More importantly, the grantee organized a buy-back system for the *Aloe vera* harvest - a key factor in the success of the project. Their excellent teamwork made the project a resounding success.

The monthly income of the beneficiary fisher families has increased by 26% and fishing pressure on the Puttalam lagoon has decreased by 5%. With the beneficiaries doing well there was a ripple effect - more fisher families have taken to *Aloe vera* cultivation. There were only 29 beneficiaries to start with, but the number of fisher families cultivating aloe has now increased to 44.

Another significant achievement of the project is its contribution to biodiversity conservation. The cosmetic company which buys the fisher families' harvest no longer collects *Aloe vera* in the wild.

## Annex 1 - Format for quarterly technical progress report

**Mangroves for the Future (MFF)**
*Investing in Coastal Ecosystems*

**Small Grants Facility**

**Technical Progress Report**

1. Project No:
2. Project Title:
3. Project duration:
4. Total project cost:
5. Reporting Period: from…… to…….
6. Progress of activities/deliverables during the period under review. Please report on each deliverable set down in Annex 1 of the Contract:
7. Work Plan for the next quarter:
8. Issues and constraints:
9. Signature of Grantee, and date:

Signature: …… Date:……..

For Office Use

10. Comments of the Small Grants Officer:
11. Comments of the Country Representative:

Signature: ……..… Date:……..

## Annex 2 a - Reimbursement claim form

Project Name
Project Number MFF/xx
Grantee XX
Period XX
Currency LKR

| | Description | Approved Budget (A) | Reference to supporting documents | Expenditure | | | | Total Expenditure (B) | Balance (A-B) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Submission for 1st Quarter | Submission for 2nd Quarter | Submission for 3rd Quarter | Submission for 4th Quarter | | |
| 1 | PREPARATORY WORK | | | | | | | | |
| 2 | PROJECT ACTIVITIES | | | | | | | | |
| | Ecosystem Restoration | | | | | | | | |
| | Conservation | | | | | | | | |
| | Awareness creation | | | | | | | | |
| | Training/ Capacity Building | | | | | | | | |
| 3 | MONITORING & EVALUATION | | | | | | | | |
| 5 | PROJECT MANAGEMENT | | | | | | | | |
| | TOTAL | | | | | | | | |

**Summary**
Total Expenditure

Less
Funds Received from IUCN
**Balance**

**Notes**

1 **Approved Budget**
Budget attached to the signed contract is the approved budget

2 **Reference to the supporting documents**
The supporting documents should be clearly marked with reference numbers and related to the expenditure items in the financial report.
The reference number/s should be noted in this column

3 **Expenditure**
Expenses incurred in each quarter should be entered in these columns

4 **Total Expenditure**
Sum of the quarterly expenditures should be entered in this column

5 **Balance**
Approved budget (A) minus Total expenditure (B) is the Balance

## Annex 2 b - Sample of an actual reimbursement claim

Project Name
Project Number MFF/xx
Grantee XX
Period XX
Currency LKR

| | Description | Approved Budget (A) | Reference to supporting documents | Expenditure | | | | Total Expenditure (B) | Balance (A-B) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Submission for 1st Quarter | Submission for 2nd Quarter | Submission for 3rd Quarter | Submission for 4th Quarter | | |
| 1 | **PREPARATORY WORK** | | | | | | | | |
| | * Beneficiary identification | 20,000 | | 20,000 | | | | 20,000 | |
| 2 | **PROJECT ACTIVITIES** | | | | | | | | |
| | **Ecosystem Restoration** | | | | | | | | |
| | # Establishment of alternative fuel-wood plantation (0.5 ac) | 36,000 | | | | 20,000 | | 20,000 | 16,000 |
| | * **Conservation** | | | | | | | | |
| | # Purchase of fuel efficient stoves, training in their use and establishment | 150,000 | | | 120,000 | 29,900 | | 149,900 | 100 |
| | # Purchase & planting mangrove plants | 80,000 | | | | 22,000 | 29,075 | 51,075 | 28,925 |
| | * **Awareness creation** | | | | | | | | |
| | # awareness creation - school children | 36,000 | | | 36,000 | | | 36,000 | |
| | * **Training/Capacity Building** | | | | | | | | |
| | # Training on fuel saving stoves | 20,000 | | | 20,000 | | | 20,000 | |
| | # Field discussions | 12,000 | | | | 12,000 | | 12,000 | |
| 3 | **MONITORING & EVALUATION** | 12,000 | | | | | 9,100 | 9,100 | 2,900 |
| 5 | **PROJECT MANAGEMENT** | | | | | | | | |
| | * Personnel | 84,000 | | 14,000 | 21,000 | 21,000 | 28,000 | 84,000 | |
| | **TOTAL** | 450,000 | | 34,000 | 197,000 | 104,900 | 66,175 | 402,075 | 47,925 |

**Summary**

| | |
|---|---|
| Total Expenditure | 402,075 |
| Less | |
| Funds Received from IUCN | 389,000 |
| **Balance** | **13,075** |

## Annex 3 - Posters

Mangroves for the Future
Highlights of the Small Grants Programme, Sri Lanka

Mangroves for the Future

### 1. GROWING TREES TO IMPROVE COASTAL HABITATS

**Coastal communities plant local plant varieties to restore their degraded coastal and riverine areas and protect them from natural hazards**

Two 'green belts'[1] each 0.5 km x 4 m in extent, were established in the Hadjiar and Ethukaal beaches in Kattankudy. Plant survival is high due to protective covers made of palmyrah leaves and after-care by the communities.

[Project of Arifa Enterprises in Batticaloa]

Women from fisher families planted a 1,200 square meter area in the South Panama beach with 2,880 seedlings of coastal plant varieties[2].

[Project of the National Ethnic Unity Foundation (NEUF) in Panama]

5,500 bamboo plantlets propagated in community nurseries were planted in 15 hectares in Rekawa to reduce erosion from river banks and enhance the riverine ecosystem. The bamboo will also be an alternative for wood from mangroves.

[Project of the Ruhunu Development Consortium in Rekawa-Ussangoda-Kalametiya area]

1. Using *Casuarina* and *Barringtonia* spp.
2. Species include Maila (*Bauhinia racemosa*), Wara (*Calotropis gigantea*), Demba (*Syzygium assimile*) and Palmyrah (*Borassus flabellifer*).

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Mangroves for the Future
Highlights of the Small Grants Programme, Sri Lanka

Mangroves for the Future

# 2. REGENERATING MANGROVE AREAS TO IMPROVE PRODUCTIVITY

**Communities plant mangroves in degraded lagoon habitats to conserve biodiversity and improve the productivity and services.**

Fisher families are actively involved in rehabilitating selected areas in the Batticaloa lagoon by planting 17,000 mangrove seedlings[1].

[Project of MANDRU in Batticaloa]

The lagoon fishermen have rallied as a group to plant 10,000 mangrove seedlings[2] to rehabilitate the Manthode and Kothukal areas of the Pottuvil lagoon.

[Project of True Vision in Pottuvil]

Members of St. Mary's Fisheries Cooperative Society Ltd. restored a 4,000 square meter degraded mangrove patch in Kurrakkanhena village in the Puttalam lagoon with 10,000 mangrove seedlings[3] raised in community-managed nurseries.

[Project of the Semuthu Fisheries Cooperative Society Ltd in Puttalam]

1. *Rhizophora mucronata, Excoecaria agallocha, Corebus manga, Sonneratia alba, Bruguiera gymnorrhiza, Lumnitzera racemosa, and Avicennia marina.*
2. *9,000 R. mucronata and 1,000 A. marina*
3. *A. marina, L. racemosa, E. agallocha and R. mucronata.*

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Mangroves for the Future

# 3. MANAGING MANGROVE RESOURCES FOR LONG-TERM BENEFITS

## Coastal communities turn to efficient cooking energy options to reduce their dependency on mangroves for fuel wood

A community operated bio-gas unit, using kitchen and organic waste, supplies gas for cooking to four households in the fringes of Madu Ganga estuary area.

While reducing the use of mangrove fuel wood, the residual slurry is popular among the neighbourhood as a fertilizer for their home gardens. The neighbours in turn give kitchen waste to the unit.

[Project of HELP-O in the Madu Ganga area]

The energy efficient cooking stoves reduce fuel wood usage by 40-50%. Over 400 households are now using these stoves for cooking in several villages near the Puttalam lagoon and in the Rekawa-Ussangoda-Kalametiya area.

[Projects of the Vinivida NGO Coalition, Semuthu Fisheries Cooperative Society Ltd, PEARLS in Puttalam and SEEDO in the Rekawa-Ussangoda-Kalametiya area]

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Mangroves for the Future
Highlights of the Small Grants Programme, Sri Lanka

Mangroves for the Future
INVESTING IN COASTAL ECOSYSTEMS

# 4. REDUCING PRESSURE AND DAMAGE TO MANGROVE ECOSYSTEMS

## Initiatives based on community participation help maintain the integrity of mangrove ecosystems

In the banks of the Lunama lagoon, an eco-friendly accommodation for visitors has been built to enable tourists and students to enjoy and study the lagoon with minimal disturbance. The facilities are being provided by a community-based organization (CBO), which is also providing guided tours of the lagoons and the mangroves. The income is being shared among the members of the CBO who have obtained employment at this facility.

[Project of the Ruk Diya Eco Holidays in the Rekawa-Ussangoda-Kalametiya area]

As in other parts of the country, fishermen in the Madu Ganga area use kerosene for lighting their lamps during night fishing expeditions. Each fishing boat is estimated to use one litre of kerosene worth LKR 85 a day.

As a pilot initiative, 18 fishermen have been given electric lamps, which are charged during the day-time through a community-operated solar panel. The fishermen no longer use kerosene, and each fisherman is able to save about LKR 25,000 annually. This also reduces noxious kerosene fumes and other gases.

[Project of the Nagenahiru Foundation in Madu Ganga area]

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Highlights of the Small Grants Programme, Sri Lanka

Mangroves for the Future
INVESTING IN COASTAL ECOSYSTEMS

# 5. ENSURING REGULAR INCOME THAT SUPPORTS CONSERVATION EFFORTS

## Women in fisher families begin *Aloe vera* (medicinal aloe) cultivation and reed-based handicraft production as alternative income generation activities

Fifteen women from fishing families in Kudawa and Anawasala in Puttalam began *Aloe vera* cultivation in February, 2009. The harvest is sold to a leading cosmetics production company in Sri Lanka. The average monthly income is LKR 2,000 – 5,500. Preliminary surveys show that fishing is now reduced by 5% and monthly income of fisher families increased by 26%.

Furthermore, a marketing channel has been established for the women's society. The company no longer buys wild-collected *Aloe vera*.

[Project of the Marine and Coastal Resources Conservation Foundation in Puttalam]

Fifty women from fisher families in Danketiya, Palathuduwa and Netolpitiya villages were trained in reed-based handicraft production as an alternative income generation activity. Reeds are collected from the nearby wetland.

Each person is now able to make an additional monthly income between LKR 2,000 – 6,000. Their average monthly income has increased by about 60%.

[Project of the Wanasarana Thurulatha Swechcha Society in Rekawa-Ussangoda-Kalametiya area]

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# 6. WORKING TOGETHER TO INTRODUCE PRODUCTIVE COMMUNITY FARMING PRACTICES

## Fisher communities restore an old village tank and transform the tank environment into habitable and productive agricultural land

The Palugaswewa tank in Lunama was rehabilitated with the participation of 22 farmers, increasing the tank capacity from 6 to 14 hectare meters.

These farm families are now able to cultivate the surrounding land (Palugaswewa Farm), even during the drought season, and increase their income.

[Project of the Youth Enterprises Information Centre in Rekawa-Ussangoda-Kalametiya area]

Fisher families are introduced to agriculture, which is a novel experience for them. Women in the fisher families are trained and assisted in cultivating their homesteads, with vegetables and fruits as well as perennial crops, to secure food and additional income from the sale of surplus produce.

The farmers have enhanced their knowledge on sustainable agricultural practices.

A fence erected around the 9 hectare farm prevents crop damage by wild animals.

[Project of the Youth Enterprises Information Centre in Rekawa-Ussangoda-Kalametiya area]

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Highlights of the Small Grants Programme, Sri Lanka

Mangroves for the Future

# 7. ADOPTING LOW-INPUT HOME GARDENING PRACTICES

## Coastal communities learn homestead agriculture using low-input sustainable cultivation methods to increase access to food and improve income

Women in fisher families were trained in low input agricultural practices, and provided with seed materials initially. They now cultivate a variety of vegetables such as snake gourd, bitter gourd, okra and fruit varieties such as banana and papaw.

[Project of the Methsith Development Foundation]

Fisher families in the Soththupitiya Wadiya enjoy a new-found vocation – cultivating their own homesteads.

They are trained on organic agriculture to reduce expenses on chemical fertilisers and pesticides as well as on the benefits of chemical-free produce.

[Project of the Sewa Lanka Foundation in Puttalam]

Fifty members of Amma Thottam Janahanda Fishing Women's Guild cultivate their home gardens with vegetables and several varieties of greens. They enjoy their new work which provides them with a fresh supply of vegetables.

[Project of PEARLS in Puttalam]

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Mangroves for the Future

# 8. PROVIDING OPPORTUNITIES FOR ALTERNATIVE LIVELIHOODS

## Women in fisher communities and tsunami-affected families supplement their income by engaging in livestock development

In Pottuvil, women from eight fisher families are engaged in running a goat farm. The farm, surrounded by a protective live fence, ensures that no damage is done by the goats to the surrounding environment.

The number of goats almost doubled within a period of six months. The women are actively engaged in the new venture; they now receive an average monthly income of LKR 2,000.

[Project of the Al-Ameen Samurdhi Society in Pottuvil]

The newly-established poultry farm in Pottuvil is run by almost two dozen widows of tsunami affected families (including those who were also affected by the armed conflict in the Eastern Province).

Profit from the initial sale of 500 chickens fetched LKR 40,000, which was equally divided amongst the women.

[Project of the Arugam Bay Tourism Association in Arugam Bay, Pottuvil]

Sixteen widows are engaged in rearing 32 buffaloes at a community farm owned by the Livestock Development Dairy Farmers' Association. Their monthly production of milk averages about 500 litres, which fetches LKR 17,000 - an additional income to the families.

[Project of the Livestock Development Dairy Farmers' Association in Pottuvil]

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Mangroves for the Future
INVESTING IN COASTAL ECOSYSTEMS

# 9. HARNESSING COASTAL ECOSYSTEMS TO AUGMENT INCOME

**Fishermen are engaged in seaweed farming and sea bass culture in a systematic and sustainable manner to increase their income and thereby reduce over-exploitation of the fishery**

Dried seaweed and dessert from it

Seaweed is cultivated for the extraction of carrageenans, used in confectionery and in other industries. As a pilot project, the seaweed *Eucheuma denticulatum* is being cultivated in cages in the near-shore off Panama and Pottuvil by six fishermen using 60 cages.

100 g of seaweed seed grow to 1 kg within a period of two months.

Seaweed can be harvested in 6-8 weeks after stocking; hence the possibility of cultivating 4-5 cycles per year in Panama and Pottuvil.

Income of fisher families increased by about LKR 2,000 per month.

[Project of Sewa Lanka Foundation in Panama & Pottuvil areas]

Sea bass *(Lates calcarifer)* is a delicately-flavoured flesh, and is in demand both locally and abroad. Four fishermen from the Ampe Freshwater Fisheries Cooperative Society are practicing sea bass cage culture in the Madu Ganga estuary, on a pilot scale. Fish can be harvested in five months.

The additional income per cycle per fisherman is approximately LKR 28,000. This initiative has reduced the over-exploitation of fishery resources.

[Project of Sewa Lanka Foundation in the Madu Ganga area]

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Mangroves for the Future

# 10. SHARING KNOWLEDGE TO REDUCE THREATS TO COASTAL ECOSYSTEMS

## School children, youth and elders are actively engaged to monitor threats to their coastal ecosystems

About of 100 junior and 75 senior students in two remote schools in Ambalantota learned about mangrove ecosystems though discussions and field excursions. Knowledge gathered from project activities was shared with other schools and the elders in the area through exhibitions and other events held by the students.

[Project of the Visura Development Foundation in the Rekawa-Ussangoda-Kalametiya area]

Fifty school children from two schools in Ambalangoda and Balapitiya, and about 100 youth and elderly persons in the Galmanduwa, Pathemulla and Maduwa islands in Balapitiya were made aware of the threats to the Madu Ganga wetland ecosystem – an important RAMSAR site.

A water testing facility was set up in the vicinity so that students in the area are able to test the quality of the water and monitor the health of the wetland environment.

[Project of the Lanka Jathika Sarvodaya Shramadana Sangamaya in the Madu Ganga area]



Educating resource users and school children and involving them in protecting the Madu Ganga environment by combining 'Knowledge & Action' is one of the many services provided by the Mangrove Education Centre in Pathemulla. About 1,000 people attend these sessions annually.

The corrugated sheet shed built in 2006 was replaced with a brick-walled permanent structure to provide a comfortable learning atmosphere for the visitors.

[Project of the Nagenahiru Foundation in the Madu Ganga area]

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Mangroves for the Future
INVESTING IN COASTAL ECOSYSTEMS

MFF builds on a history of coastal management interventions before and after the 2004 tsunami. It focuses on the countries most-affected by the tsunami; **India, Indonesia, Maldives, Seychelles, Sri Lanka,** and **Thailand**. MFF also includes other countries of the Region that face similar issues, with an overall aim to promote an integrated ocean wide approach to coastal zone management.

Its long-term management strategy is based on identified needs and priorities that emerged from extensive consultations with over 200 individuals and 160 institutions involved in coastal management in the Region.

MFF uses mangroves as a flagship ecosystem in recognition of the important role mangroves played in reducing the damage caused by the tsunami, and the implications on livelihoods because of mangrove forest destruction. But **MFF is inclusive of all coastal ecosystems,** including coral reefs, estuaries, lagoons, sandy beaches, sea grasses and wetlands.

Its vision is a healthier, more prosperous and secure future for all sections of the coastal population in Indian Ocean countries. It is a unique partnership-led initiative working in four key areas of influence: regional cooperation, national programme support, private sector engagement and community action.

The initiative undertakes collective actions to build knowledge, strengthen empowerment, and enhance governance through 15 broad programmes of work to address the current and future threats, and to conserve and restore coastal ecosystems. These are implemented through a series of on-the-ground projects, through small and large grant modalities.

MFF seeks more effective and inclusive institutions, policies and mechanisms for cooperation at national and regional levels by prioritising coastal ecosystem management across national development agendas, policies and budgets.

www.mangrovesforthefuture.org