Mangroves for the Future
INVESTING IN COASTAL ECOSYSTEMS

Coastal Resilience in Action

Achievements and Lessons Learned from Mangroves for the Future in Pakistan 2014-2018

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Author: Zaigham Khan

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Available from: IUCN Pakistan
Country Office
1 Bath Island, Road,
Karachi 75530, Pakistan.
Tel: +92 (21) 35861540/41/42
Fax: +92 (21) 35861448
www.mangrovesforthefuture.org

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ABBREVIATIONS AND ACRONYMS

AIT	Asian Institute of Technology
CSR	Corporate Social Responsibility
HEC	Higher Education Commission
HRDN	Human Resource Development Network
ICM	Integrated Coastal Management
IUCN	International Union for Conservation of Nature
KM	Knowledge Management
LAPA	Local Adaptation Plans of Action
MEA	Multilateral Environmental Agreement
MFF	Mangroves for Future
MPA	Marine Protected Area
MoCC	Ministry of Climate Change
NCB	National Coordination Body
PN	Pakistan Navy
PQA	Port Qasim Authority
SDGs	Sustainable Development Goals
TED	Turtle Excluder Device
UN	United Nations
UNDP	United Nations Development Programme
UNEP-COBSEA	United Nations Environment Programme-Coordinating Body on the Seas of East Asia
WWF	Worldwide Fund for Nature

BACKGROUND

Mangroves for the Future (MFF) is a unique partner-led initiative aimed at promoting investment in coastal ecosystem conservation. In December 2006, President Bill Clinton planted the first mangrove tree to launch the MFF initiative at a fishing village on Phuket Island, Thailand. MFF provides a collaborative platform among the many different agencies, sectors and countries who are addressing challenges to coastal ecosystem and livelihood issues, to work towards a common goal.

The MFF, launched by IUCN and UNDP in 2006 as a response to the 2004 Indian Ocean Tsunami, aims to improve natural coastal infrastructure and strengthen resilience against future natural disasters. MFF focuses on the role of healthy, well-managed coastal ecosystems as a contribution to building human resilience in ecosystem dependent coastal communities in Bangladesh, Cambodia, India, Indonesia, Maldives, Myanmar, Pakistan, Seychelles, Sri Lanka, Thailand and Viet Nam. MFF is operational in Pakistan since 2010.

In its third phase, MFF Programme (2015-18) became operational in eleven countries of the Asia Region. Under this phase, MFF has introduced a Community Resilience Framework as a guiding principle for building resilience in coastal communities.

In Pakistan, MFF has made substantial progress since inception of the programme in 2010. The National Coordinating Body of MFF Pakistan has been vital in steering several ground and policy level actions to support the implementation of the National Strategy and Action Plan. The ground level actions have targeted the key thematic issues identified through resilience assessment of the five priority geographic sites along the coast of Pakistan. Cumulatively, 30 small grant projects, a medium project and two regional projects have been supported for

implementation in Pakistan through MFF funding. These initiatives pertain to participatory conservation and restoration of mangroves; sustainable management of coastal fisheries resources; post-harvest fish catch management; community resilience building; livelihoods development; coastal erosion; demonstrating biological waste water treatment systems; gender empowerment and advocacy; and capacity building and awareness on integrated coastal resources management.

At the policy level, MFF Pakistan has taken initiatives to support the process of establishment of Marine Protected Areas and to promote transboundary collaboration in coastal resources management with neighbouring countries. The knowledge products produced under MFF- are contributing to policy debates and discussion on coastal issues. Cumulatively, MFF has supported capacity building of more than 200 participants in various aspects of coastal management including Integrated Coastal Management (ICM); Training of Trainers on Ecosystem-based Disaster Risk Reduction; Mangrove Restoration, Sustainable Fisheries Management; Economics of Mangrove and Coastal Ecosystems; Resilience Assessment; Gender Integrated Planning; Project Cycle Management; and Private Sector Engagement. Greater emphasis is now being placed to build upon MFF experiences to develop national ownership and national programmes dedicated to Integrated Coastal Management in Pakistan.

This study analyses overall achievements of MFF Programme in Pakistan and highlights key lessons learnt and the challenges to its implementation and gives recommendations to further enhance the impact of MFF interventions in Pakistan.

METHODOLOGY

A multipronged approach was adopted for this lessons learnt study that included desk review, interviews, focus group discussions and fields visits. A comprehensive desk review of relevant documents was carried out and reports were analysed to assess progress and achievements of MFF in Pakistan. The documents included National Strategy and Action Plan, MFF Progress Reports and Country webpage on MFF website.

In order to prepare this study a range of stakeholders were interviewed including senior government officials of partner organizations, businessmen and beneficiaries. The consultant also interviewed key federal, provincial, private sector and civil society members of the National Coordinating Body (NCB) Pakistan and Country Representative of IUCN Pakistan to document perception of stakeholders about the programme.

Presentations were also sought from selected MFF grantees and focus group discussions were held with beneficiaries of MFF grants to assess the outcomes that have been demonstrated and record their views.

The study makes an effort to identify constraints, including policy issues that have impacted on effective implementation of MFF in Pakistan and recommend solutions to tackle the challenges. It compiles and synthesizes all information gathered from desk review and interviews in a consolidated report on lessons learnt from MFF Pakistan implementation.

The report is divided and discussed under the four sections, as follows:

a. Communications and knowledge management.
b. Stakeholder's empowerment.
c. Governance of coastal resources (policy relevance, partnership building).
d. Sustainability aspects of MFF in Pakistan.

1. COMMUNICATION AND KNOWLEDGE MANAGEMENT

Knowledge management is one of the major strengths of the IUCN and this also reflects organization's capacity to produce, mediate and disseminate knowledge at different levels ranging from the communities to institutions of higher education and the policy making institutions.

The knowledge management aspect of MFF is reflective of the fact that "the field of knowledge management is no longer being treated in isolation from the fields of communications management and partnerships management."[i] Merged into knowledge management are the concepts of dialogue, relationship building, and adaptive learning through constant interaction with users, who have their own knowledge and perspectives to contribute.

1.1 Achievements and Challenges

1.1.1 Production of Knowledge

Lack of reliable data has been a serious impediment to management of coastal and marine resources in Pakistan. The MFF has tried to overcome this gap through various studies and researches. For example; National Assessment Report on Coastal Erosion in Pakistan, prepared in 2014, documents the status of coastal erosion in Pakistan. It is the first study of its kind in the country that focuses on this neglected aspect of coastal management. A Coastal Erosion Management Plan was prepared based on the recommendation of a situation analysis report on coastal erosion in Pakistan conducted under the project. The management plan entails various institutional, policy and ground level actions to address coastal erosion issues in Pakistan. Another related scientific knowledge product produced by MFF is the research report on Valuation of Mangroves in PQA of Indus Delta which assessed the economic values of mangrove ecosystem to the society. The study has estimated total values of mangrove products and service for study area at USD 1,363 /ha/year. Based on the study, a paper titled Mangrove Ecosystem Services: Indus Delta (PQA) has been published in Journal of Geoscience and Environment Protection, 2016, vol. 4, 179-184. The study is a valuable contribution to the knowledge on values of mangrove ecosystems in Pakistan.

Some studies conducted at the local level are helpful to both the national development sector and also feed to the regional knowledge resources. The program used the MFF Gender Analysis Guide/ Toolkit to develop baseline knowledge, to examine gender dimensions related to coastal and natural resources use, livelihoods development and ecosystems management and to understand gaps and opportunities that exist for mainstreaming of gender consideration in planning processes. These studies were conducted at two sites, Gwatar Bay along the Baluchistan coast and Keti Bundar area of the Indus Delta. These studies provide the much needed insight into existing gender roles in coastal and marine resources management.

Some studies were also carried out through the Small Grants Programme. For example, an Assessment of stock and market potential of consumable seaweeds

i Mobilizing IUCN's Knowledge to secure a sustainable future, The IUCN Knowledge Management Study Executive Summary Heather Creech, Director, Knowledge Communications, IISD December 2004.

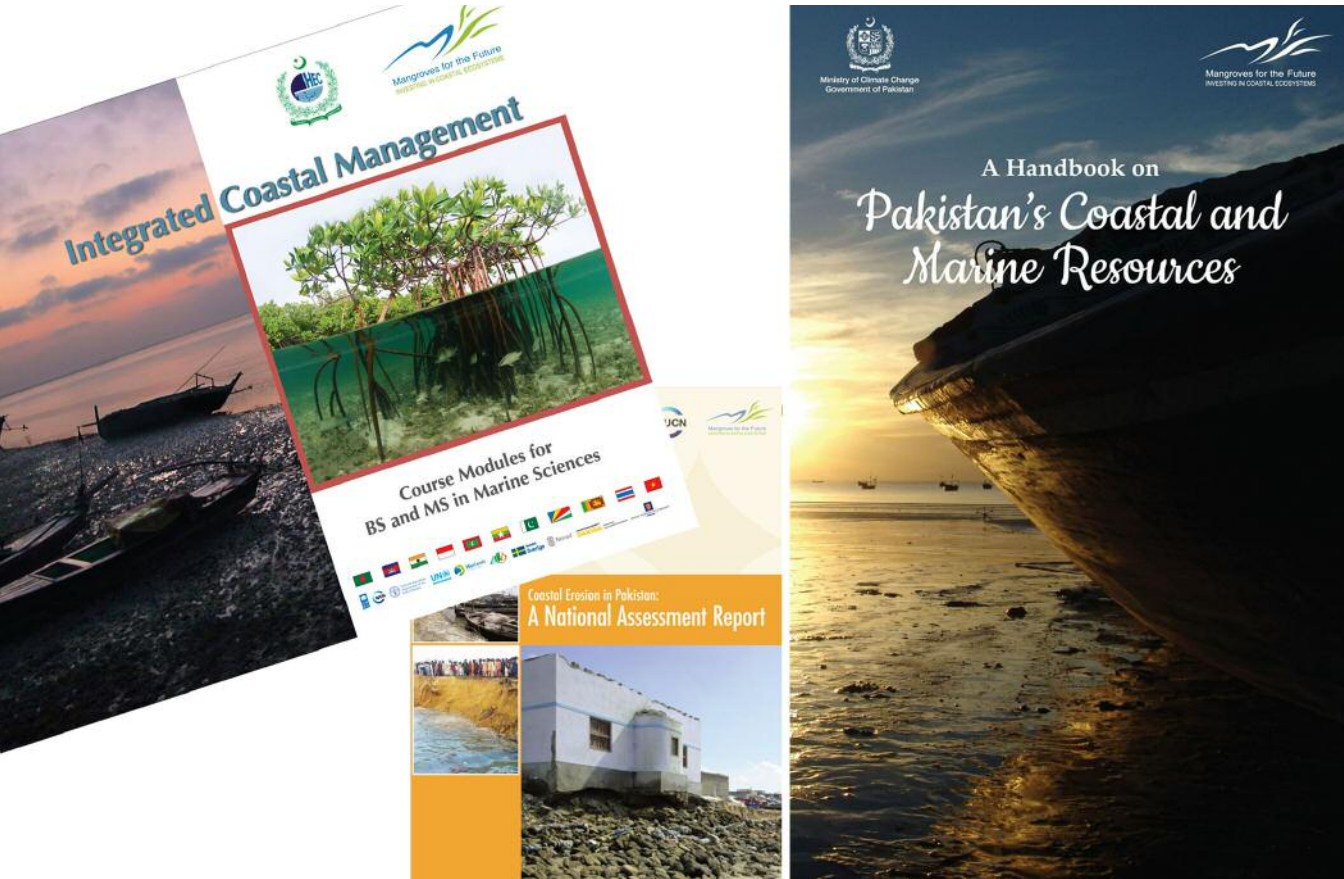
along on-shore and the near-shore waters of Karachi explore the future potential of industrial use of commercial seaweeds. Based on the study, a scientific paper titled, 'Assessment of stock and market potential of consumable seaweed in near shore waters along the Karachi coast has been prepared for publication.
An assessment report on impacts of mangrove based camel grazing in coastal Baluchistan has been also documented through a small grant project. The survey report was shared with the Baluchistan Forest & Wildlife Department as a reference for future use.

1.1.2 Working with Universities

MFF have been able to create linkages between the regional centres of learning and the national universities to promote knowledge on coastal management. It has also supported national universities in preparing the knowledge base and courses for the purpose.

The Higher Education Commission (HEC) of Pakistan is an independent, autonomous, and constitutionally established institution of primary funding, overseeing, regulating, and accrediting the higher education efforts in Pakistan. IUCN was able to work closely with the commission and succeeded in inclusion of two elective course modules of 30 credit hours each into the postgraduate curriculum. The module focuses on Integrated Coastal Management and Mangrovology (on Mangroves). The inclusion of these modules in HEC curriculum makes these modules available for offer to the BS and MS students by all the universities in Pakistan.

Both the course modules have been included in the revised curriculum of BS & MS in Marine Sciences. These modules were developed with support of MFF regional experts and Asian Institute of Technology (AIT). The ICM course is based on the curriculum of Regional ICM Course delivered at AIT.



MFF has organised five Postgraduate Certificate Courses on Integrated Coastal Management at Asian Institute of Technology, Bangkok, Thailand in which eleven participants from Pakistan have been trained.

With MFF's support, plan for implementation of ICM course in Pakistan has been underway through capacity building of senior lecturers to support delivery ICM course module in two universities, including University of Karachi and Lasbela University of Agriculture, Water and Marine Sciences.

1.1.3 School Book on Coastal Ecosystems and Biodiversity

A number of environmental concepts are included in curriculum of both the government and private schools and colleges which are taught as a part of their education programme. However, realising gaps and inconsistencies in information on coastal areas, concise information on coastal and marine resources was documented in the form of a Handbook on Pakistan's Coastal and Marine Resource based on review of environmental topics included in the secondary and post-secondary curriculum. The Handbook also highlights the various current and future actions and approaches that contribute to the sustainable management the coastal and marine resources of Pakistan and is a useful reference guide for the teachers and academicians for environmental education in colleges and universities.

1.1.4 Communication Activities

Wide-ranging communication activities were undertaken by MFF and its partners to disseminate information and knowledge on themes of coastal management. Below is a list of some of the relevant activities.

- Communities workshops on disaster risks focused on climate change as an area of concern and protective role of mangroves in protection against disasters, and enhancing resilience of the local communities.

- A national conference was held in Karachi on importance and role of mangroves in mitigating the effects of floods and cyclones in the region.
- Guest lectures highlighting the contemporary issues of climate change and alternate energy options were organized in various units of Pakistan Navy.
- Various communication products were prepared by grantees including T-shirts, brochures, pamphlets, banners and posters to disseminate the MFF messages.
- Photo-documentation of SGF activities was undertaken and photo exhibitions were organised.
- Project stories based on grants programme and NCB activities were published in newspapers and magazines and highlighted through media.
- Five documentaries on coastal issue produced and disseminated for highlighting coastal management issues.
- MFF website was used to share information, knowledge and best practices. It played functions of transparency, advocacy, knowledge sharing and communication.

1.1.5 Knowledge Building of Communities and Diffusion of Innovation

MFF used social mobilization to promote sustainable fishing practices and introduce environmental friendly practices. MFF partners undertook social mobilization, group discussions with target groups and exposure visits to sensitize fisherfolks toward adoption of sustainable fishing practices.

Through social mobilisation, 10 fisher folk groups (30 fishermen) were supported in replacement of harmful fishing nets and to switch over to sustainable fishing practices. Use of harmful fishing nets has resulted in depletion of fish stock and impacted livelihoods of dependent communities badly. Some community surveys show that such unsustainable practices are resulting in huge loss to marine resources. In some areas, fish stocks have depleted upto 87% percent. This has also resulted in 51% loss of income due to fast declining fish catches.

The harmful small meshed nets, locally named Bulo and Gujjo, are used to catch fish of very small size that is sold as raw material for the poultry feed. Uses of these nets deplete the fish stock rejuvenating process. Dwindling fish stocks have resulted in loss of income for fishermen communities, aggravating their poverty.

In addition, fishermen were also trained to improve fish catch handling and quality assurance of their catch for improved marketing and their awareness and capacities were built in sustainable fisheries management.

One small but important innovation was provision of iceboxes to small fishermen. Because of unavailability of iceboxes, fishermen used to avoid venturing into the deep sea for longer durations and returned early to sell the catch. They also had to face difficulty in preserving their catch and selling it for better value.

1.1.6 Lessons Learnt

- Absence of current and credible knowledge and data is a huge hurdle in the way of evidence based policy and action. This gap can be filled through the integration of research with the processes of decision-making and management. Research can be effective when designed to be relevant to policy and attention is paid to factors like timeliness and presentation.

- Shared understanding on issues is the key to effective policy and action. The identification of issues should be based on integration of existing knowledge with additional studies in order to promote a common understanding of ecosystem changes in coastal areas. The issue identification works best when it not only contains comprehensive assessment of the status of the coastal and marine ecosystems elements but also identifies the major threats and issues that have to be tackled.

- In order to improve policy making on marine ecosystems, it is important to remove barriers inhibiting knowledge exchange among researchers/academia and decisions-makers. Accessible research publications and seminars and trainings can help in filling this gap.

- Academia is strongly interested in mangrove conservation and coastal management. Through proper linkages and support, universities can produce science graduates with sound understanding of marine ecosystems and coast management. Interventions with universities show that huge opportunities of partnership and working together exist that can be built upon.

- The coastal communities have a preparedness for diffusion of sustainable innovation. However, prevalent market practices and lack of effective communication are serious barriers to change. These barriers can be overcome with the involvement of community based organizations.

- Mainstream media has a strong interest in mangroves and coastal issues. However, it faces problems in understanding the technical issues and also needs access and guidance.

2. STAKEHOLDER EMPOWERMENT

Empowerment includes both processes and outcomes. The theory of change suggests that empowerment can be based in actions, activates and structures. The outcomes of such processes result in a level of being empowered. However, empowerment processes and outcomes vary in their outward form and it is not possible to apply a single standard to fully capture its meaning for all people in all contexts.[ii]

Empowering processes are ones in which attempt to gain control, obtain needed resources, and critically understand one's social environment are fundamental. The process is empowering if it helps people develop skills so they can become independent problem solvers and diction-makers.

MFF defines empowerment in terms of the ability of the coastal communities to exercise management control of resources and institutions to enhance livelihood opportunities and secure sustainable use of resources upon which communities depend for the present and future generations. MFF also recognizes that empowerment is most effective when a process called "co-management" is adopted and development is carried out in conjunction with established government agencies and coastal communities' access and control over coastal resources is enhanced. Such a process provides greater chance for economic benefits to accrue locally.[iii]

MFF works closely with local partners to build the capacity of communities and local government to effectively manage their resources. In terms of strengthening the stakeholder empowerment process, MFF builds capacity and understanding that enables genuine multi-stakeholder engagement that enables people and institutions to sustainably manage coastal ecosystems.

2.1 Achievements

2.1.1 Grant Facility

The main vehicle for implementation of National Strategy and Action Plan (NSAP) has been MFF small grant facility (SGF) projects. The grant facility has proved an effective tool, enabling MFF to demonstrate a number of successful management models and approaches that empower stakeholders in coastal management decision making processes. The projects supported by MFF covered a wide range of interventions including support to restoration and management of ecological services in degraded coastal habitats; development of supplementary livelihood opportunities that contribute to reduce threats to biodiversity; and building of capacity through the social empowerment process (education, awareness raising, leadership and organizational development, etc.) for collective action in community based management and co-management.

ii Terms of empowerment/exemplars of prevention: Toward a theory for community psychology, American Journal of Community Psychology Rappaport, J. 1987.

iii Strengthening the Empowerment Process, Case studies featuring MFF interventions that empower stakeholders to engage in decision-making that supports sustainable management of coastal ecosystems, https://www.mangrovesforthefuture.org/news-and-media/news/asia-region/strengthening-the-empowerment-process/

These projects have succeeded in engaging various social groups including fishermen, students, youth, women and local leaders involving them in various initiatives aimed at participatory coastal resource conservation. These projects have also contributed to the creation of an enabling policy environment. The themes covered in the SGF grants include participatory conservation of mangroves, advocacy and awareness on mangroves and other coastal resources to highlight their roles in disaster risks reduction, livelihoods and environmental management

Through grants facility 28 community/civil society organizations were supported to implement 30 small grant projects. These projects strengthened these organizations and facilitated them to organize the communities to take charge of their resources, use them sustainably and protect their environment.

Most members of the fisher folk communities helped through the programme are amongst the most powerless sections of the society. The fisherfolk live away from the cities and are considered low caste by other communities. Their financial situation also marginalizes them.

Improvement in fish catch handling practices was ensured through capacity building and distribution of fish catch handling tools among the selected fisherfolk. Under a small grant, 100 fishermen have been trained in post-harvest fish catch handling techniques and 80 of them equipped with fish catch handling tools to improve the quality of fish catch.

The quality of catch also improved as a result of insulated storage boxes provided under the project that enable beneficiaries to preserve their catch. Due to better post-harvest fish catch management, buyers offered better value of catch to fishermen. Beneficiaries have recorded a jump in their incomes as the rates have increased from Rs. 90-125 to Rs. 130-250 per kilogram.

Under another project, crab fattening ponds were constructed at Keti Bundar area and the fishermen were trained in crab pond management through Sindh Fisheries Department. Due to enhanced income, local fishermen have replicated these ponds and the practice has become popular in the area.

Yet under another small grant, the local fisher folks have supported establishment of a fish sanctuary/no take zone in Miani Hor. An area of 179 ha of Lagoon was demarcated and legally notified as fish sanctuary/no take zone in collaboration with the Baluchistan Fisheries Department. The community also established a watch and ward mechanism to monitor no take zone/ sanctuary adopted rules for management of the no take zone/sanctuary. These rules were also disseminated locally in the form of a brochure. Significant improvement in fish and shrimp stocks has been noticed by the community within the no take zone area.

In addition, NCB members took initiatives for mangrove restoration. The Government of Sindh has initiated implementation of for large scale replantation of degraded mangrove areas in the Indus Delta through local funding. A joint mangrove rehabilitation project is under implementation in collaboration with IUCN Pakistan with total project cost of PKR 698 million. Similarly, the Government of Baluchistan implemented a scheme for mangrove conservation in Gwadar area through the public funding.

MFF Pakistan has also encouraged partnership building for coastal resources conservation. The Pakistan International Bulk Terminal, a private sector organisation, has supported a mangrove rehabilitation project over 500ha with technical support from IUCN Pakistan to offset the damaged mangroves due to their terminal facility development. Similarly, other private sector organisations such as Engro have also supported mangrove offset projects in the coastal areas along Sindh coast.

- MFF also encouraged investment from other donors in the coastal areas. A project “Saving the Endangered Sea Turtles on Coastal Areas of Pakistan” was implemented by IUCN in collaboration with financial support by USAID Small Grants & Ambassador’s Fund Program which complemented MFF objectives.

The project enabled Pakistan's certification by US State Department Inspection Team for shrimp export during 2015 and 2016 due to promotion of use of TEDs in fishing nets.

2.1.2 Women's Empowerment

Women's have a close relationship with environment and nature. However, they are often excluded from the decision making processes. MFF in Pakistan promoted empowerment of women of coastal communities by including them into various initiatives and supporting various exclusive initiatives that have improved the relative power of women in the communities.

MFF promoted gender mainstreaming by providing opportunities for women to take part in implementation of project activities. Some projects specifically focused on capacity building of women in alternate livelihood skills and other grant projects involved women in various project activities including training in making of fuel efficient stoves, exposure visits and mangrove planting. Below is a highlight of some of the activities that focused on gender mainstreaming.

- Women, children and teachers of coastal villages Rehri and Ibrahim Hyderi were part of awareness programmes of a MFF supported project related to disaster risk and mangroves. This included 500 male and female students and 38 male and female community members. The quantitative post project evaluation showed a 73% increase in the knowledge and awareness of the women in Ibrahim Hyderi and Rehri in the post survey about natural disasters and

tsunamis and how they were generated. The quantitative data showed a 42% increase in the knowledge of the women about mangroves. The post survey data showed that there was a 40% increase in knowledge of students of selected schools about mangroves.

- Under another small grant more than 600 women and children in Keti Bundar area were involved in mangrove planting and protection, and were part of various environmental awareness raising activities.

- Women group consisting of 30 community women established in Gwater Bay area of Baluchistan. Ten members of the group were involved in mangrove plantation activities, besides, 15 girls students participated in a mangrove plantation event organized by the grantee, 27 female students participated in viewing of environmental documentaries.

- Twelve women members of Fishermen Development Organisation, village Kakapir, Sandspit were involved in mangrove plantation and nursery establishment, and approximately 312 girls' and boy students were part of awareness raising activities.

- Approximately, 50 women from different areas of Pakistan belonging to different walks of society participated in National Conference on Mangrove Ecosystem of Pakistan and exposure visit to mangrove areas organized by HRDN at Karachi.

- Women and youth were also part of quiz competition, beach cleaning and awareness raising activities organised by Pakistan Navy, a MGF grantee.

- MFF trained 10 women trained as Master Trainers in making of fuel efficient stoves to support adoption of energy efficient stove in Kalmat area of Baluchistan. MFF also supported 50 households in adoption of fuel efficient stoves and electrification with LED light unit. The use of improved fuel-efficient stoves can reduce the production of smoke and harmful gasses within households, reduce the use of biomass by up to 40 percent (wood, crop waste, dung etc.), reduce cooking cycle times, and create significant household safety and labour benefits. That means less carbon dioxide emissions that cause health and safety problems. It also means less in the way of deforestation, which helps conserve the mangroves and other vegetation.

- Similarly, solar lights bring clean, reliable and affordable emissions-free lighting to under-served communities. These lights create opportunities for children, students and families to improve their lives and living conditions – all without the need for power grid access, costly infrastructure investments, or environmental pollution. They are significant in terms of improving health, safety and ecosystems conservation. Provision and adoption of fuel efficient stoves and installation of solar LED light units under the small grant implemented at Kalmat has reduced women's work burden involved in collection of fuelwood and saved them from hazards of smoke. They have also been able to save time that can be used for other productive activities. The community members reported approximately 30%-40% saving on fuelwood due to adoption of fuel efficient stoves. LED lights have enabled children to study at night.

- In Keti Bandar area of Indus Delta, MFF has equipped 37 women with alternate livelihood skills including tailoring, candle making and value added craft development. Most trained women belonged to extremely poor households and reported using their skills to earn additional income ranging between PKR800 to PKR2,000 during the period of four months, besides saving the cost of PKR600 per month that they otherwise spent on buying candles for their household consumption. Similarly, the women who learnt sewing skills and were provided with machines reported savings from stitching family cloths, as well as earning additional income from sewing cloths for others. The beneficiaries have reported using the earned income for supporting household expenditures on food and health.

- Under another small grant livelihood skills of women in Sandspit were developed through vocational training targeting 55 women. The women skills were developed inhome-based backing and embroidery. In deeply conservative areas, MFF has given women a chance to become entrepreneurs and take charge of their lives. One beneficiary, Khair-un-nisa, has set up a tailoring shop in her house and has since been overwhelmed by stitching orders from local area. Another beneficiary, Saima, who developed a love for baking during the training, is now able to bake a variety of cookies, cakes, donuts and pizza to cater to order for birthdays, weddings and other family events.

MFF also imparted knowledge and enhanced capacities of various stakeholders through various trainings and seminars. A training workshop on "Eco-Disaster Risk Reduction and Ecosystem-based Adaptation to Climate Change", organised in HEJ Institute, University of Karachi was attended by more than 20 participants belonging to government, civil society and academia. The training was organised with support of a Resource Person who participated in regional training of trainers on Disaster Risk Reduction and Climate Change Adaptation which was organised by MFF in collaboration with United Nations Environment Programme (UNEP) at Bangkok.

2.1.3 Lessons Learnt

- Capacity of CBOs and NGOs working in the coastal areas varies widely. Their capacity building can play an important role in sustainable development of coastal areas. Capacity must first be instilled within individuals and then expressed through institutions. Specialized training and exchanges among practitioners form effective strategies when they are tailored to the identified needs in the different sectors and specific places.

- It is important to balance development and conservation. In Pakistan's coastal regions degradation has impacted the sustainability of livelihoods of local populations. The decline in local economies is leading to negative impacts on subsistence activities. The ecological and economic systems have linkages, often with direct and immediate feedback.
- Women in coastal areas are willing to enter into gainful economic activities and play an important role in the local economies. When supported in a culturally sensitive manner, they find support from male members of their families as well.

- By diversifying the livelihood options of marginalized families, the basic needs can be met through varied sources of income. Facilitating communities' access to basic social services can widen the range of socioeconomic opportunities available to them. Livelihood development or sustainable livelihood development in coastal communities is still in its infancy. Partnering with other development partners can be helpful.

- Coastal communities often live in relative isolation away from the main markets. Their daily routines also prohibit interaction with markets. This creates a huge hurdle in guarding against economic exploitation by the middlemen and promotion of gainful economic activities. Weak linkages with markets create a hurdle to sustainability of income generating activities.

- Contributing to improving livelihood can play an important part in partnering with local communities to protect ecosystems. Livelihood is not just confined to production activities.

- Livelihood development not only reduces the harvest pressure, it also cushions community members from the impact of poverty and helps in responding to the immediate needs of the people.

3. GOVERNANCE OF COASTAL RESOURCES (POLICY RELEVANCE, PARTNERSHIP BUILDING)

Like many other natural resources, multiple actors are involved in governance of mangroves and other natural resources. As local people benefit from timber, fuelwood, fish, crabs and coastal protection, governance involves actors from forestry, fisheries, and coastal zone management, including community-based organizations, NGOs and local and national governments.

The management of marine resources is scattered among an array of stakeholders in a federal set up where each province is run by a different political party. Pakistan's coast is divided in two provinces with different governments in charge, while the federal government is commanded by a third party. Similarly, due to strategic importance of Pakistan's coastline, the national security services, including Rangers, Pakistan Navy and the Ministry of Defence have an important role in governance of Pakistan's coastline. Pakistanis do not consider themselves a maritime nation and most policymakers have little idea of living conditions of coastal communities and the marine resources. MFF therefore had the challenge of bringing those stakeholders together who had no previous experience of working together.

3.1 National Coordination Body (NCB)

Effective governance of marine resources requires effective coordination between different stakeholders. Absence of such a policy forum has been a significant roadblock in the way of catalyzing collective action of key stakeholders.

MFF has tried to achieve coordination the 'National Coordinating Body (NCB)' in each of the member countries. This mechanism has proved extremely helpful in Pakistan and benefitted far beyond the scope of the programme. The 'implementation mechanism' of the MFF has provided a unique opportunity for programme to assemble all the relevant stakeholders, from the government, private sector, and civil society, on a single 'forum'.

The NCB Pakistan is a multi-stakeholder body headed by the Secretary Ministry of Climate Change (MoCC). The federal MoCC is a leading policymaking institution on environmental issues including the coastal zone management. MoCC is also the focal ministry for national, regional and international coordination on policy matters related to environment.

The NCB comprises 26 members representing various government departments (17), civil society (05), private sector organisations (01), UN Agencies (02) and academic institution (01). A sub-committee (Working Group) consisting of 09 members drawn from NCB members facilitates NCB in technical matters and decision-making processes.

The NCB meetings have provided a unique platform for improved horizontal and vertical interactions among key coastal stakeholders to discuss important coastal issues. The NCB has succeeded in generating a momentum for collaborative efforts and kindled interest in coastal resources conservation and provided a platform for engagement among all the key stakeholders.

3.2 Working with Pakistan Navy

An important success of MFF is its success in engaging important non-traditional actors in coastal governance including Pakistan Navy (PN). Due to the nature of defence services, development sector remains shy of creating close association with them. However, a relationship based on suspicions can be extremely harmful to the themes where defence services are closely involved. Building a relationship with the Pakistan Navy and the Ministry of Defence was not simple either, as these agencies operate under strict regulations. Focal points also change frequently. Despite this, a steady relationship has been maintained, resulting in a staunch friendship with the institution as a whole.

MFF has been able to build strategic policy level engagement with Pakistan Navy (PN), a powerful and influential stakeholder. MFF built the relationship of trust in small steps starting from small grant project in 2011 that focused on raising environmental awareness among PN personnel. The project was able to sensitise senior officers and win support of Pakistan's Chief of Naval Staff.

Due to this association, MFF was allowed to access important locations which are usually restricted to general public. As a member of the MFF NCB, the Pakistan Navy played an instrumental role in designation of Astola Island as Pakistan's first Marine Protected Area (MPA). Pakistan Navy was a key facilitator of the designation process, helping to organise site visits to the island for experts to conduct situational assessments.

MFF has also influenced Pakistan Navy's interest in mangrove conservation. In 2016, PN launched a mangrove plantation campaign with the pledge to plant more than one million mangrove plants in collaboration with forestry departments of Sindh and Baluchistan provinces. Since, then the campaign has become a regular feature of PN activities with enhanced pledged by PN to plant two million plants during 2018 in collaboration with provincial forestry departments of Sindh and Baluchistan.

3.3 Sewage Management at Manora Island

The Manora Island is a culturally rich area located close to the Karachi harbour. Though it contributes only 4% of sewage entering the sea from the entire Karachi metropolis, water pollution emanating from the island has a significant impact on the harbour and beach, which draws an estimated 150,000 visitors per year. Pollution in harbor areas results in adverse impact on the marine life and reduces the lifespan of naval ships, boats and other infrastructure due to enhanced corrosion.

Being cognisant of coastal pollution issues, Pakistan Navy implemented MFF funded medium grant project for demonstrating a wastewater treatment facility based on the concept of a wetland system for biological wastewater treatment using aquatic reed plants. The facility has a capacity to treat 30,000 gallons of wastewater per day which has been used for greening purposes at Manora Island, transforming a barren sports field into a lush green field. Artificially-constructed wetland is

designed to imitate the processes found in natural wetland ecosystems. The system involves a series of gravel filter beds planted with reeds to treat wastewater passing through the root zone. The system is cost-effective as it is less energy-intensive than traditional wastewater treatment techniques and uses natural materials and processes. The project has helped in saving thousands of gallons of freshwater that may otherwise have been used for the greening purposes.

Navy has extended the system to its other installations and residential area. The success of the project encouraged Pakistan Navy to upscale the treatment initiative on its own. Pakistan Navy has established similar models with a cumulative capacity of treating about 287,000 gallons wastewater in their various units in Karachi and have plans to expand the system to other areas making the combined capacity of all such systems to 500,000 gallons per day.

3.4 Engagement with Private Sector

MFF has been able to facilitate formation of a Business & Biodiversity (B&B) Platform which is led by the private sector to address coastal sustainability issues. The founding chapter of the platform in the name of Karachi Conservation was launched in December 2017 in Port Qasim Area of Karachi with support from some of the leading corporate sector companies including Engro Foundation, Pakistan International Bulk Terminal (PIBT) and FELDA WESTBURY Qasim (Pvt) Limited (FWQ) joining as the Initiating Partners together with the Port Qasim Authority (PQA), which is a regulatory agency of port operations and business in the area. Both PQA and Engro Foundation are members of NCB Pakistan.

B&B platform is an initiative with a marked shift from the traditional focus on CSR activities to a more encompassing focus on sustainable development. The initiative was founded as a follow up of the first ever roundtable of leading private sector companies organised in April 2017 in collaboration with Port Qasim Authority (PQA) to float the idea, and an exposure visit to Sri Lanka to learn from their experiences. Keeping in view the regional experiences; the mission, vision, goals, governance structure of the proposed platform has been formulated to expand the membership base of the platform.

3.5 Policy Achievements

The MFF programme in Pakistan is aligned with the country's commitments under the Convention on Biological Diversity (CBD), and more generally under the Sustainable Development Goals (SDGs). With respect to multilateral environmental agreement (MEA), the NCB initiatives and grants have contributed to SDGs 3, 5, 6, 13, 14 and 17, as well as Aichi Targets 1, 6, 8, 11, 14, 15 and 19 and Ramsar Convention. The most important contribution being to ABT 11 and SDG 14 with the declaration of Astola Island MPA, and NCB's perseverance to establish other Marine Protected Areas, such as in Miani Hor, Churna Island and Gwatar Bay. Pakistan, in September 2012, passed its National Climate Change Policy, which mentions vulnerability of coastal and marine ecosystems. A National Climate Change Action Plan has also been developed. The Local Adaptation Plans of Action (LAPA) adopts a decentralised and bottom-up approach. MFF activities have been consistent with various recommendations made in the National Framework for Implementation of Climate Change Policy Government of Pakistan (2014 -2030).

With MFF's regional project support, National Assessment Report on Coastal Erosion in Pakistan, prepared in 2014, succeeded in drawing attention of various stakeholders towards this challenging issue. The Standing Committee of the Senate of Pakistan requested the Ministry of Climate Change for provision of a copy of National Assessment Report on Coastal Erosion which was produced under the MFF funded Regional Coastal Erosion Project implemented by UNEP-COBSEA. The Standing Committee has directed relevant authorities to follow the recommendations of the National Assessment Report.

Following the recommendations of the study, a coastal erosion management plan has been prepared, outlining various institutional, policy and ground level actions to address coastal erosion issues in Pakistan. Pakistan Navy has also integrated the recommendations of the report in the National Maritime Policy.

3.6 Establishing Marine Protection Areas (MPAs)

Vital marine ecosystems are facing increasing threats. An important approach to counter this threat is to establish Marine Protected Areas (MPAs) around biologically diverse hotspots. This can be best done by involving local communities in the process. By delineating the boundaries of MPAs through stakeholder consultation and consensus, encroachment becomes less likely and enforcement becomes more effective. When local communities are involved in the governance and protection of their ecosystems, much of the pressure on both nature and governments can also be relieved.

NCB of MFF Pakistan took initiative to create a Technical Working Group and initiated a dialogue process among the various federal, provincial and civil society organisations for identification and designation of MPAs which resulted in designation of Astola Island as the first MPA in Pakistan through a notification issued by the Government of Baluchistan on June 15, 2017. The Astola Island is located approximately 25 km off the coast of Baluchistan province and is Pakistan's largest offshore island spanning 6.7 km2. The island is ecologically important as its beaches provide nesting ground for the endangered green turtle and hawksbill turtle, while also supporting a large variety of migratory birds. The Astola saw-scaled viper is also endemic to the island. The island's marine ecology supports a variety of corals, creating a breeding ground for a vast range of marine species. Designation of Astola as MPA also supported to the fulfilment of a resolution to declare Astola Island an MPA which was adopted at the IUCN Congress held in Hawaii in September 2016.

3.7 Miani Hor – Establishment of Community Managed No Take Zone

Through a small grant, MFF was able to establish a no-take zone/fish sanctuary at Miani Hor, covering an area of 179 ha to support recovery of depleting fish stock. A co-management model has been adopted for the purpose. The no take zone has been officially notified by the Baluchistan Fisheries Department under fisheries legislation. This no take zone is the first ever notified no-take zone established along the coast of Pakistan.

Miani Hor no-take zone provides safe habitat for recovery of shrimp and fish species in a lagoon that provides livelihoods to 90% of the local communities. Local

communities have reported a positive impact on the diversity and abundance of fish species in the lagoon.

3.8 Lessons Learnt

- The lack of coordination between various departments is a major hurdle for action. Due to this lack of coordination, departments keep guessing about each other's mandate and avoid taking pro-active actions. Similarly, many actions that require multi-departmental involvement remain unresolved.

- Improved institutional arrangements and mechanisms can play a crucial role in sustainable management of coastal resources and ecosystems. Such mechanism for policy making can work wonders when multiple stakeholders are involved and they enjoy access to scientific knowledge and links with the communities.

- Orientation of government departments is critical to redirect their political will in favour of mangrove protection and coastal resources management. If sustainability is to be attained, government officials have to have longer term perspectives in development.

- The Coastal Management Policies must have a more holistic view of the coastal system as an integrated natural-human system. but also of the significant value of ecosystem goods and services and the importance of viewing coastal management as an opportunity to invest in future sustainable development opportunities.

- Effective regional coordination with national implementation can facilitate cross-fertilization of ideas and learning from other countries in the region and regional institutions.

- Law enforcement is vital to coastal resource management: Policies may be in place but require collaborative and credible efforts for effective enforcement.

- Management of MPAs should be based on the socio-cultural conditions and needs of communities and the locally perceived threats/issues and sound data on local resource status.

- In order to build trust, formal workshops, participatory training exercises and community development should be undertaken to build trust.

- The goals of objectives of MPAs should be formulated and communicated in a manner that they are understandable to the target audiences. Similarly, economic and other benefits of MPAs should be clarified to the communities to maintain stakeholder interests and manage expectations.

Create a forum for stakeholder interaction, query, and debate to provide opportunities for collaboration and mediation within the context of social interactions and conflicts.

4. SUSTAINABILITY

The sustainability plan of MFF focuses on three key elements: institutionalization of National Coordinating Body as a national coastal management body; exploring resources to sustain NCB functioning and MFF grants and support adoption of "soft governance" approach of MFF through national capacity building.

As government ministries and state institutions have assumed the leadership role of NCB, the institutional sustainability of the MFF is ensured. In all likelihood, it will continue as a vibrant forum for coordinated actions and decision-making on coastal issues. Ownership of the initiative is clear from the fact that MFF members have started co-hosting NCB meetings on rotational basis.

IUCN has also succeeded in engaging large private sector organizations that can play an important role in supporting NCB Operations and other MFF initiatives. The private sector organizations have already made some headway in that directions and have also made commitments to support NCB meetings. IUCN has also succeeded in diversifying the funding portfolio with support from private sector organisations.

The MFF, throughout its lifespan, has focused on capacity building of civil society organizations, academia and government institutions. The enhanced social capital can go a long way in ensuring the sustainability of the MFF initiatives.

The learning integrated into universities through introduction of ICM Course in Curriculum will also sustain the soft governance approach as a part of the tertiary education of future environmental professionals. Teachers and academics trained on the coastal management will be able to keep teaching. Enhanced capacity of the community organizations is another aspect of sustainability. These organizations are a part of the social capital of the coastal communities and they will keep working in their respective locations through support from local funding sources.

4.1 Lessons Learnt

A number of donors have strong interest in the work of MFF Pakistan, as it covers many cross-cutting themes including environment, poverty, gender and community development. Sustainability of MMF in Pakistan requires broadening the base of support for the initiative.

- NCB members are willing to take steps for institutionalization of NCB as a national coastal management body. There is a wider recognition that the NCB Pakistan is the only national coastal management body in Pakistan comprising key government departments, civil society organizations, members of academia and representatives from the private sector. The members recognise NCB as a vibrant forum for coordinated actions and decision-making on coastal issues.

- Private sector is willing to work with the government and credible non-profit organizations on issues of environment. Many businesses realize that with the growth in Pakistan's economy, the ecological footprint of the corporate sector is bound to grow. They are willing to play a part in mitigating threats to coastal ecosystems.

Mangroves for the Future
INVESTING IN COASTAL ECOSYSTEMS

About Mangroves for the Future

Mangroves for the Future (MFF) is a unique partner-led initiative to promote investment in coastal ecosystem conservation for sustainable development. Co-chaired by IUCN and UNDP, MFF provides a platform for collaboration among the many different agencies, sectors and countries which are addressing challenges to coastal ecosys-tem and livelihood issues. The goal is to promote an integrated ocean-wide approach to coastal management and to building the resilience of ecosystem-dependent coastal communities.

MFF builds on a history of coastal management interventions before and after the 2004 Indian Ocean tsunami. It initially focused on the countries that were worst affect-ed by the tsunami – India, Indonesia, Maldives, Seychelles, Sri Lanka and Thailand. More recently it has expanded to include Bangladesh, Cambodia, Myanmar, Pakistan and Viet Nam.

Mangroves are the flagship of the initiative, but MFF is inclusive of all types of coastal ecosystem, such as coral reefs, estuaries, lagoons, sandy beaches, sea grasses and wetlands.

The MFF grants facility offers small, medium and regional grants to support initiatives that provide practical, hands-on demonstrations of effective coastal management in action. Each country manages its own MFF programme through a National Coordinat-ing Body which includes representation from government, NGOs and the private sec-tor.

MFF addresses priorities for long-term sustainable coastal ecosystem management which include, among others: climate change adaptation and mitigation, disaster risk reduction, promotion of ecosystem health, development of sustainable livelihoods, and active engagement of the private sector in developing sustainable business practices. The emphasis is on generating knowledge, empowering local communities and advo-cating for policy solutions that will support best practice in integrated coastal manage-ment.

Moving forward, MFF will increasingly focus on building resilience of ecosystem-dependent coastal communities by promoting nature based solutions and by showcas-ing the climate change adaptation and mitigation benefits that can be achieved with healthy mangrove forests and other types of coastal vegetation.

MFF is funded by Sida, Norad, Danida and the Royal Norwegian Embassy in Thailand.

Learn more at: www.mangrovesforthefuture.org