



Mangroves for the Future  
INVESTING IN COASTAL ECOSYSTEMS

# Pakistan: National Strategy and Action Plan for Mangroves for the Future

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Norad



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## ACRONYMS AND ABBREVIATIONS

BAP	Biodiversity Action Plan	NCB	National Coordination Body
BCDA	Balochistan Coastal Development Authority	NCS	National Conservation Strategy
BFWD	Balochistan Forest and Wildlife Department	NEQS	National Environmental Quality Standards
CBO	Community Based Organization	NGO	Non Governmental Organization
CMS	Convention on Migratory Species	NIO	National Institute of Oceanography
EEZ	Exclusive Economic Zone	NSAP	National Strategy & Action Plan
EIA	Environmental Impact Assessment	PAs	Protected Areas
EPA	Environment Protection Agency	PN	Pakistan Navy
FAO	Food and Agriculture Organization	PoWs	Programme of Works
ICM	Integrated Coastal Management	PPP	Public -Private Partnership
IOSEA	Indian Ocean South-East Asian Region	PQA	Port Qasim Authority
IUCN	International Union for the Conservation of Nature	PWP	Pakistan Wetlands Programme
KPT	Karachi Port Trust	SCDA	Sindh Coastal Development Authority
LGF	Large Grants Fund	SGF	Small Grants Fund
M&E	Monitoring and Evaluation	SoED	Sindh State of Environment and Development
MFD	Marine Fisheries Department	UNEP	United Nations Environment Programme
MFF	Mangroves for the Future	UNDP	United Nations Development Program
MoU	Memorandum of Understanding	WWF	World Wide Fund for Nature
MSA	Maritime Security Agency	ZSD	Zoological Survey Department

## BACKGROUND

The coastline of Pakistan lies in the provinces of Sindh and Balochistan. It stretches approximately 990 kilometers, of which 760 kilometers lies in Balochistan province and 230 Km (NIO) along the Sindh coast. The two coasts have different climatic and physical characteristics. The Sindh coast receives the tail end of the southwest monsoon, while the Balochistan coast is semi-tropical and Arid (BCS 2000). The coastline of Pakistan is rich in natural resources and thus the focus of much socio-economic activity. The coastal areas along the Balochistan are characterized by oceanic waters and a rocky, and coral-reef with a thin & scattered mangrove stands. The Sindh coast has a shallower profile with a combination of mangrove forests, mudflats, and sandy beaches. The coastline of Pakistan is a highly productive fishing area due to the presence of an active delta and seasonal streams. Pakistan's coastal resources are extremely important both in terms of biodiversity and economic activity generated through industry which contributes significantly to provincial and national economic development.

Pakistan's Mangrove for the Future (MFF) National Strategy and Action Plan is being developed within a framework consisting of:

- The MFF initiative, as presented in a number of documents
- National goals, strategies and plans for the coastal zone
- Needs identified through National Coordinating Body (NCB) consultative processes;
- A series of Sub-Committee of NCB meetings.

An outline version of the strategy and work plan was developed in November 2009, and likely to be approved in the 6<sup>th</sup> Regional Steering Committee (RSC) meeting to be held in Thailand in late January 2010, when this draft document will be presented.



The MFF approach is not to replace or compete with national policies, programmes and strategies, but rather use them as a national framework. Wherever appropriate, and in accordance with priorities, the MFF will seek to strengthen or complement existing strategies. At the regional level comparative studies, workshops and international networking will encourage the exchange of information and experience, and permit joint action on issues of mutual concern. At the local level, the MFF enables participating countries to implement the strategies by providing support to both large scale and small scale projects.

The Pakistan's National Strategy presented in this document outlines the relationship between the MFF approach with existing country policies and strategies. The current MFF programme during Phase-I runs until 2012, and this Strategy focuses on priorities for next Phase as discussed by the National Coordinating Body within the context when Pakistan will become full member of the MFF programmes of work.

The goal of the MFF is to conserve and restore coastal ecosystems as key assets which support human well-being and security in the Indian Ocean. This goal is pursued through two objectives.

- Promote direct actions and interventions required to manage coastal ecosystems sustainably, equitably and effectively.
- Strengthen the broader policy and legal frameworks at national and provincial levels that enable environmentally sustainable coastal development.

Fifteen programmes of work have been identified at the regional level, grouped in terms of their intention to build knowledge, strengthen empowerment, and enhance governance

## 1. INTRODUCTION

Mangroves for the Future (MFF) programme is a unique partner-led initiative to promote investment in conservation and sustainable management of coastal ecosystem to ensure food security and mitigation of climate change. It provides a collaborative platform among different agencies, sectors and countries who are addressing challenges to coastal ecosystem and livelihood issues, to work towards a common goal. MFF builds on a history of coastal management interventions before and after the 2004 tsunami, especially the call to continue the momentum and partnerships generated by the immediate post-tsunami response. In the aftermath of the tsunami of 2004, in the country that suffered most deaths, Indonesia, coastal mangroves were regarded as having provided a partial buffer which countered the force of the tsunami wave and thereby saved lives (UNEP, 2005).

MFF National Strategy and Action Plan (NSAP) will support the development vision of the Government of Pakistan and associated policies as they relate to sustainable use and management of coastal ecosystems and adaptation to climate change in the context of integrated coastal management. The NSAP does not solely focus mangrove forests but entails mangrove ecosystem and associated biodiversity, thus the term 'mangrove' is used as a symbolic label. Pakistan's NSAP specifically addresses and treats issues related to the dominant coastal ecosystems viz mangroves, estuaries turtle nesting beaches and coral reef. NSAP Pakistan will contribute towards ecosystem-based integrated coastal management (ICM) and its goal would be to improve the quality of life of dependent communities. ICM by its inherent nature requires actions at local geographic sites - both entire ecosystems and parts thereof.

The NSAP conforms to Government of Pakistan's basic requirement of good governance and community participation in development programmes. It builds on the principles that a central body (NCB) should perform only those tasks which cannot be performed effectively at a more immediate or local level. However at local level Programme of Works (PoW) will be implemented by different organizations under the guidance of NCB. The NSAP follows a cross sectoral collaborative approach in harmony with other policies and programmes of development sectors including climate change mitigation and adaptation policy.

In the context of challenges to the coastal areas of Pakistan, the NSAP paves the way for development of ICM programme for Pakistan to ensure good governance, knowledge management, community empowerment, and public-private partnership (sustainable financing) by:

- Setting up ICM models in selected coastal ecosystems
- Scaling up the successful models at the entire coastal belt

## 2. SITUATION ANALYSIS

Pakistan is largely arid and semi-arid country, but with wide geographical and altitudinal range, from tropical coasts bordering the Arabian Sea to mountain tops exceeding 8000 meters, combined with the blending of elements from different biogeographical regions, ensures an interesting and diverse flora and fauna. Pakistan's coastline, which forms the northern boundary of the Arabian Sea, is about 990 kilometers long, with 22,820 square kilometers of territorial waters and an Exclusive Economic Zone of about 240,000 square kilometers. The Balochistan coast extends 760 kilometers from the mouth of the Hub River in the east to the Iranian border in the west, whereas the coast in Sindh is approximately 230 kilometers of length.



The coastal communities of Pakistan are mostly engaged with fishery, with a small percentage in agriculture and allied professions. In view of dwindling sources of livelihood in the region, due to a variety of factors, a vast majority (about 79%) live below the poverty line. A peculiar feature of the region is its wind potential for generation of electricity which, according to one estimate, is about 43000MW. Then there is a potential of around 50,000 acres of land to be utilized for aquaculture and enterprises associated with it like fish grading, packaging and preservation (Sindh Fisheries Department). The picturesque beaches of the Makran coast offer opportunities for eco-tourism as well. The government of Pakistan is committed to the development of this region with particular emphasis on poverty reduction.

In Pakistan, the mangrove forests are present at only four geographic locations along the coastline. Some 0.6 million hectares in the Indus delta area classified as "mangrove forests". Environmentally and economically these forests are of prime importance as breeding grounds for shrimps, fish and various bird species. This ecosystem possesses large variety of animal species and provides safe refuge for them. Coral reef discovered by a survey mission of PWP during 2005 at Balochistan coast is another important natural resource. So far around 30,000 hectares of mangrove have been replanted at various locations in Indus delta and Balochistan coast through innovative planting techniques. These planting and nursery techniques are now being used in Gulf for raising mangrove plantations along the arid coasts.

Large earthquakes along the Makran Zone are infrequent, but the presence of active mud volcano (Chandargupt) along the stretch of costal belt is a potential threat . It is quite possible that historical tsunamis in this region have not been properly reported or documented. Such past tsunamis affected Southern Pakistan, India, Iran, Oman, the Maldives and other countries bordering the Indian Ocean.

The best known of the historical tsunamis in the region is the one generated by the great earthquake of November 28, 1945 off Pakistan's Makran Coast (Balochistan) in the Northern Arabian Sea. The destructive tsunami killed more than 4,000 people in Southern Pakistan but also caused great loss of life and devastation along the coasts of Western India, Iran, Oman and possibly elsewhere.(Shiekh,M.M 1992); other disasters such as torrential rains and tropical cyclones e.g Yemyin in 2007 on the Balochistan and Sindh coast reaffirms the need for conserving existing stands of mangrove and establishing plantations

Although Pakistan has not directly suffered from the disaster of tsunami 2004; however many lessons were learned from the tsunami including the need to enhance and preserve the natural protection provided by the mangrove ecosystems to the coastal settlements, and the importance of proper risk and vulnerability assessments in development planning.

In Pakistan, the coastal environment is under pressure from development activities such as harbour dredging, land reclamation, disposal of solid waste and sewage. The coastal ecosystem is also vulnerable to the impact of climate change. In the context of these challenges, the Pakistan MFF

NSAP provides an opportunity for implementation of Integrated Coastal Management (ICM) programme to safeguard natural environment.

## **2.1 Country Setting**

### **(a) Geography**

The geographical area of the Islamic Republic of Pakistan including Azad Jammu and Kashmir is 87.98 million hectares. Pakistan is situated at the north-western end of the South-Asian subcontinent. Pakistan with population of 170 million stands seventh amongst the ten most populous countries of the world. It lies approximately between 24° and 37° north latitude, and between 61° and 78° east longitude. It borders Afghanistan and Iran to the west, China to the north, and India to the east. There is a coastline of 990; 230 km belonging to the province of Sindh and 760 km to the Balochistan.

### **(b) Climate**

The climate of Pakistan is generally arid subtropical, with under 250 mm of annual rainfall, and some of the driest regions receive less than 125 mm annually. There is a strip of humid subtropical terrain in the Punjab and some southern slopes of the Himalaya are monsoon influenced and in a few places rainfall exceeds 2000 mm annually. The most important period for rainfall is the south-west monsoon, from June to September. Temperatures are heavily influenced by altitude; in the period just before the monsoon, temperatures in the central plains average 35-40°C degrees and in the deserts may reach 45°C degree. Winter temperatures in the northern mountains remains below freezing for several months.

## **2.2 Coastal processes**

The coastal zone is the interface between two major environmental domains, the land and sea. In Pakistan the Makran coast range, which closely parallels the coast, effectively defines the zone and separates it physically, socially and economically from the rest of Balochistan Province. A narrow continental shelf – in much of the area, only 15-20 kilometers wide at the 200 meter isobaths- defines the extent of the coastal waters. From this point the continental slope dips sharply, delimiting an extensive, deep, offshore zone.. Administratively, the coastal belt of Balochistan falls into two districts, Gawadar and Lasbela. Similarly in Sindh the coastal area is subdivided into the Indus delta/creek system and the Karachi coast. The coastal morphology of Sindh is characterized by a network of tidal creeks and several small islands with scattered mangrove vegetation which constitutes the largest arid land mangroves in the world and the twenty-fourth largest mangrove stands in term of coverage. Cyclones on the Pakistani coast are not common but do occur periodically causing considerable damage to coastal villages. After 1947, major cyclones on the coast of Sindh occurred in June 1948, November 1993 and in May 1999.(SoED 2005)

Pakistan's coastal areas are amongst the most biologically productive areas (50-200g C/m<sup>2</sup> per year). The coastal zone supports highly diversified ecosystems and provides a range of critical habitats for many organisms that are vulnerable to severe change or loss. Changing condition in coastal and terrestrial environments associated with degradation of environmental quality and the health of coastal ecosystems threatens the survival of many species and communities. The coastal domain is dramatically affected by changes in sea level, ground water level, salinity, wave pattern, current regimes, sediment budgets, storm events and erosion patterns. Physical changes themselves result in a wide variety of biological changes at the population, community and ecosystem level, which in turn affect the suitability of the coastal zone and its resource for use by human population.(IUCN 2005)

The coastal waters have high salinity (>36 percent) due to high evaporation rates, combined with negligible rainfall. Oxygen-deficient water layers sometime rise to the surface along the coast, leading to fish mortality. The wildlife along the Pakistani coast consists of both marine and terrestrial species.

## **2.3 Population**

Along the Balochistan coast, the bays and headlands provide natural harbors, around which 35 fishing communities are residing . The population is about 400,000. Four small urban centers – Jiwani,

Gwadar, Pasni and Ormara – account for more than half of the coastal population. Similarly the deltaic coast of Sindh is also sparsely populated with small fishing communities living along the creeks. In contrast, a portion of Karachi coast is heavily populated with major infrastructure development.

## 2.4 Ecosystem consequences of development trends

The vegetation on the coasts of Pakistan is dominated by mangrove forests of which four species exist. The main habitats for migratory birds, waterfowl, turtles and mammals are wetlands, estuaries, lagoons, sandy beaches and mangrove forest. More than 200 species of fish and about 20 cetaceans (PWP- communication) have been reported from the sea waters of Pakistan.

### (a) Fisheries

The role of fisheries in the country's economy is important and it is the principal source of livelihoods for the dependant fishermen communities living along the coast as well as rivers, lakes and dams. Both the Inland and Marine fisheries are very important source of animal protein.

Nevertheless the share of Fisheries in GDP is little but it contributes substantially to the national income through export earnings. During 2007-08, around 135000 metric tons of fish and fishery products were exported, earning US\$ 213 million.

**Table 2.1 Fish catch from the Pakistani coastal waters**

	<b>Makran Coast</b>	<b>Sonmiani Bay / Sindh Coast</b>	<b>Total (Thousand tonnes)</b>
Small pelagic	140-240	320-520	450-750
Demersal	120-200	170-290	300-500
Total	260-440	490-810	750-1250

Source: Surveys of Pakistan Fishery Resources, September 1983 to June 1984 - Summary of Findings Dr. Fridtjof Nansen (UNDP/FAO Programme GLO/82/001)

Pakistan has a considerable extent of resources i.e. 0.290 million sq km of marine with 990 km long coastline & extended shallow continental shelf approximately 8.6 million ha

of inland waters. During the year 2006, the total fish production was 0.604 million metric tons (more than 70% coming from marine resources). Fisheries sector provides direct employment to about 379,000 fishermen and around 400,000 people are employed in ancillary industries, mostly in coastal areas in both the categories.

The country's commercially important marine fish fauna comprise of some 250 demersal fish, 50 small pelagic, 15 medium-sized pelagic and 20 large pelagic fish. In addition, there are 15 commercial species of shrimp, 12 of squid/cuttlefish/octopus, and 5 of lobster. Whereas freshwater fauna comprises of more than 200 fish species & 35 of shellfish including prawns & crabs. Around 20 fish species are commercially important.

The fisheries sector plays an important role in the alleviation of poverty and the achievement of food security in many parts of the world. In many economies, fisheries exports generate more foreign exchange than the revenues earned from any other traded food commodity such as rice, cocoa, coffee or tea (FAO 2004). According to the Economic Survey of Pakistan 2006-2007 (ESP 2006-2007), fisheries are the principal source of livelihoods for many rural communities inhabiting the long coastline of Sindh and Balochistan, as well as inland along the major rivers, and in the vicinity of lakes and dams. In 2006 the total fish production was 604,900 metric tons. The fisheries sector is estimated to provide direct employment to about 379,000 fishermen and 400,000 people in ancillary industries (State Bank of Pakistan).

### (b) Mangrove Forests

The mangrove ecosystems of Pakistan are an important natural resource, critical for fisheries and natural barrier to various disastrous threats. Balochistan has a large coastal area and is exposed to tidal action with risk of Tsunami and hurricanes. The mangrove forests are present at only four geographic locations



along the 990 kilometer coastline. Some 0.6 million hectares in the Indus delta area classified as “mangrove forests”. Environmentally and economically these forests are of prime importance as breeding grounds for shrimps, fisheries and different bird’s species. Four different species of mangrove *Avicennia marina*, *Rhizophora mucronata*, *Ceriops tagal* and *Aegiceras corniculatum* have been recorded along the coast of Pakistan however two of them *Avicennia marina* and *Rhizophora mucronata*. dominated the mangrove flora in Pakistan. This ecosystem possesses large variety of animal species and provides safe refuge for them. So far around 30,000 hectares have been replanted at various locations in Indus delta and Makran coast through innovative planting techniques, using *Avicennia marina* and *Rhizophora mucronata*.

**Table 2.2 Area Summary Report of Mangrove Forest of Indus Delta**

#	Class	Area in Hectares	Area in Sq. Kms	%
1	Dense Mangroves	25,320	253.20	4.22
2	Medium Mangroves	34,700	347.00	5.78
3	Sparse Mangroves	46,460	464.60	7.74
4	Sandy Area	9,100	91.00	1.52
5	Mud Flats	183,250	1,832.50	30.54
6	Creeks / Channels/ Sea Water	301,170	3011.70	50.20
	Total (Source: SUPARCO 2009)	<b>600,000</b>	<b>6,000.00</b>	<b>100.0</b>

Coastline of Sindh is 230 km long, which constitute 600,000 hectares of Indus Delta (Table 2.2). The Indus Delta consists of a network of 17 major and several minor creeks mangrove islands in three districts of Sindh, namely Karachi, Thatta and Badin. Besides 600,000 ha of Indus delta( Korangi creek to Sir creek) there are additional 15,900 ha of Mangroves in Karachi coast (Cape Monze to Chinna creek). Similarly on Makran coast mangroves are mainly exists in small patches at Somiani, Kalamat and Jiwani. (Table 2.3). Indus delta mangrove ecosystem is of great

economic and ecological significance.

It is a pool of biodiversity and provides habitat for a diverse community of organisms, ranging from bacteria, fungi, fish, shrimps, birds and mammals. Mangroves are also source of fuel wood for local communities and provide fodder for camels and buffaloes. Mangroves play a crucial role in marine ecosystems as fish nursery and breeding ground, filtering systems and in shoreline stabilization. Mangroves also act as natural barriers against cyclone, tsunamis and hurricanes.

**Table 23 Area Summary Report of Mangrove Forest of Balochistan**

#	Sites	Area in Hectares	Area in Sq. Kms	%
1	Miani Hor	3,431	34.31	84.0
2	Kalamat Hor	194	1.94	5.10
3	Gwater Bay	433	4.33	11.0
	Total (Source: BFW 2009)	<b>4058</b>	<b>40.58</b>	<b>100.0</b>

Global warming, arid conditions, prolong drought spells, inadequate supply of fresh water from river Indus, industrial and thermal pollution, dumping of untreated effluents, overexploitation of mangroves for fuel wood / fodder and population pressure are main causes of degradation of Indus delta mangroves. On account of these human and natural induced stresses, mangrove forests are

depleting both quantitatively and qualitatively. Realizing the importance of mangrove ecosystems, Sindh Forest Department has initiated a massive rehabilitation / conservation programs since 1993. However, to conserve, rehabilitate and develop this vital natural heritage for our future generations, continuous efforts are required with long term vision and planning.

### (c) Marine Turtles

Marine turtles are listed on IUCN red list of species as endangered. Out of the seven marine species, two Green turtle (*Chelonia mydas*) and Olive Ridley (*Lepidochelys olivacea*) are found on the beaches of Pakistan. Pakistan has declared the marine turtles as protected species under the concerned provincial Wildlife Acts and actively involved in conservation activities since last 30 years. So far more than 760,000 hatchlings of turtles have been released in the open sea. More than 760 turtles have been tagged for monitoring their migratory pattern and routes. More recently a significant decline in the population of Olive Ridley (*Lepidochelys olivacea*) has been noticed, the reason is yet to be known (SWD Personnal communication) Migratory pattern of green turtle have also been determined by the

help of satellite transmitters. Pakistan has also signed an MoU with the Indian Ocean South East Asian (IOSEA) Marine Turtle programme under CMS.

**(d) Coral Reef**

It was widely believed that corals do not occur in Pakistan. In year 2004, during a preliminary survey of four areas along the Balochistan coast 25 species of scleractinian coral and 77 species of reef fish were discovered. Astola Island located approximately 37 km off the Balochistan coast stood out for its diversity of corals and fish. In the vicinity of Astola Island, natural sanctuary of Coral reefs exists, which is already well preserved by Navy, as the area is under Pakistan Navy custody. The expertise of Pak Navy can be utilized for further conservation of these coral reef resources, this would require a collaborative approach by developing better understanding of naval personnel about the importance of corals in the coastal and marine ecosystem. A project on environmental education with reference to coral and coral reefs in Marine and Coastal area at Jiwani, Balochistan has been successfully implemented in 2008 with the financial assistance of UNEP.

**(e) Protected Areas**

There are few protected areas existing in the coastal zone of Pakistan including Hingol National Park and Buzi Makola Wildlife Sanctuary on Balochistan coast and Keti Bunder Wildlife Sanctuary on Sindh coast. Other than these protected areas Indus delta, Nurri-Jhubo lagoons and Astola Island are designated as Ramsar sites – wetlands of international importance. In addition, Karachi coast, Hawks bay and Sandspit beaches are world famous turtles nesting sites. This coastal area also contributes as the flyway of migratory birds visiting the area in winters to avoid harsh conditions.

**(f) Tourism**

Tourism in Pakistan is not a well developed sector, and currently it does not play any significant role in the economy of the country. Compared to the volume of international tourism, domestic tourism in Pakistan is fairly large. Its role in degrading the environment has been found to be very significant, mainly because it concentrated in only a few areas including coastal areas with a high degree of seasonality. The other contributing factor in this particular activity can be recognized as religious tourism. As compare to mountainous area related tourism, the volume of coastal area tourism is very limited.



**(g) Waste management**

The beaches and coastal waters of Sindh are relatively free of man-made pollution, except at the harbours, urban discharge points and waterfront development sites. Because there are no industries or dense populations along the coastal belt, there is no large scale pollution except along the Karachi coastline. However projects both in Sindh and Balochistan such as the Gwadar Deep Sea port, Mirani Dam, constructions of Right Bank Outfall Drain, jetties and coastal highways are likely to result in the environmental degradation of coastal areas.

Seventy percent of the total industry of Pakistan is located in Karachi, Bin Qasim and Hub Choki industrial areas adjacent to the coastal zone. They discharge around 400 MGD of effluents that carry pollutants including heavy metals, organic matter, oils and greases, and toxic chemicals. The effluents are discharged untreated into the Lyari River which drains into the Arabian Sea. The river also carries calcium, alum, sulphates, magnesium, sodium, potassium, arsenic, halides and bicarbonates.



Solid waste generated in the small coastal towns and villages, as well as significant portion of the municipal and industrial waste of Karachi and Hub is dumped along the coast. This is flushed into the coastal ecosystems at high tide. Only urban Karachi generates about 10,000 to 12,000 tones of solid waste per day. This is one of the major causes of the reduced aesthetic and recreational potential of the coastline. Components of waste, such as plastic bags, are

known to damage mechanized fishing crafts and harm marine life. This problem is growing in magnitude and could increase if the coastal areas are developed without planning for the effective management and disposal of solid waste. This un-satisfactorily functioning solid waste management system poses a serious threat to the coastal life and its potential development. It is clear that current arrangements for solid waste disposal are not much effective. Waste is principally an aesthetic and health issue, but there are also serious implications for the future development along the coasts of Pakistan.

Karachi is the biggest trade and economic center of Pakistan. Karachi Port handles the majority of the country's seaborne trade while the surrounding city of Karachi accounts for half of the government's revenues and contributes 20 percent of Pakistan's GDP.

About 2,500 ships and 200 oil tankers visit the Karachi coast (Manora Channel) every year and some 20 million tons of cargo are handled here. Added to this is the large scale shipping traffic at Port Qasim, also on the Sindh coast. The sources of oil pollution in Manora Channel are bilges, washings from engine rooms of vessels, discharges and leaks from bunkering points, leaks and small spills occurring during loading and unloading from oil piers. Some oil is also brought to the channel through the Lyari River discharge. It is estimated that all the sources of oil pollution in the Karachi harbour contribute about 15 – 20,000 tons of oil per year within the harbour and adjacent waters connected with it through the Manora Channel. Port Qasim is Pakistan's second busiest port, handling about 35% of the nation's cargo (17 million tons per annum). It is located in an old channel of the Indus River at a distance of 35 kilometres east of Karachi city centre.



## 2.5 Natural hazards and consequences

A comprehensive assessment related to natural hazards and vulnerability of the coastal areas of Pakistan has not yet been made by any organization. However on the basis of past history and future trends, the following natural hazards could easily be predicted:

- Geological hazards – i.e. earthquakes and coastal erosion;
- Climate-related hazards – i.e. sea level rise and changes in monsoon pattern etc.

### (a) Environmental vulnerability

The coastal areas of Pakistan has reportedly a set pattern of natural regime; that is why the damage to the physical environment from naturally developed events is usually minor. However, with human habitation biophysical changes to the environment are inevitable. As regards the whole coastal belt of Pakistan a classification of hazard zones is yet to be determined.

### (b) Natural vulnerabilities and assets

The key geophysical features include islands, shipping ports, naval bases, large scale industrial units including ship-breaking industry, fish harbours, coastal vegetation, human settlements and coral reef. At one end of the spectrum, some of the features are assets in mitigating natural hazards, but become vulnerabilities at the other.

In summary:

- The most dominant of these features against sea induced hazards are the mangrove forests
- The topography is one of the main natural vulnerabilities in some areas whereas it is most efficient natural mitigation measure against hazards in other areas

Human-induced biophysical changes have exacerbated the natural vulnerabilities and also introduced new vulnerabilities. The coastal line is also affecting the environment with its heavy shipping of oil and subsequent dredging activities, traits common in the shipping industry. Due to country's spiraling

dependence on oil imports, oil is one of the major cargoes imported at the port. However, an estimated 90,000 tons per year of oily discharges are pumped out within port limits Oil spills are a continual hazard when importing oil, which Karachi Port does in great quantities.

The most serious impacts appear to result from the alteration of topography and coastal environment, and from improper land use patterns. Alteration of topography involves land reclamation and road maintenance activities. Alteration of coastal environment through development activities such as harbour construction, beach erosion mitigation, and land reclamation often alter the coastal processes operating along the coast. In some cases, this leads to rapid coastal erosion and decreases the natural adaptive capacity against natural hazards. The removal of mangroves for Islands (Budho & Bundal) development purposes will further exposes the coast to natural hazards, such as erosion and storms.

## 2.6 Stakeholders

There are large number of agencies and institutions at the federal and provincial level that are responsible for the coastal zone management. However, the Ministry of Environment being a Federal government's relevant policy-making body has made necessary Stakeholder consultations in preparation of this document through NCB. The organizations identified as stakeholders are:

**Table: 2.4 List of stake holder involved in consultative process**

#	Stake holders	#	Stake holders
1	Federal Ministry of Environment (MOE)	13	Ministry of Ports and Shipping
2	National Institute of Oceanography (NIO)	14	Pakistan Navy
3	Zoological Survey Department (ZSD)	15	Maritime Security Agency
4	Marine Fisheries Department	16	Pakistan Coast Guards
5	Karachi Port Trust (KPT)	17	Provincial revenue departments
6	Port Qasim Authority (PQA)	18	Provincial Environment Departments (Sindh & Balochistan)
7	Gawader Port Authority	19	Provincial Coastal Development Authorities (Sindh & Balochistan)
8	Ministry of Food, Agriculture and Livestock (MinFAL)	20	IUCN-Pakistan
9	Federal Environmental Protection Agency (Pak-EPA)	21	NGO's
10	Provincial Forest and Wildlife Departments (Sindh & Balochistan)	22	Local Communities
11	Provincial Fisheries Departments (Sindh & Balochistan)	23	Academic and Research institutions (Universities in coastal areas)
12	Tourism departments of Sindh and Balochistan.	24	Private Sector (e.g. Petroleum Exploration, Agro business and General trading sectors)

### 3. ECOSYSTEM TRENDS

The Situation Analysis revealed important trends in coastal ecosystems. Some trends are measurable, e.g. mangrove degradation or marine pollution, while others are anecdotal but very important for planning. The important question is how should the NSAP respond to these trends? Assessment of the trends is required to be made on the basis of the available monitoring tools including GIS and supportive legal instruments e.g. provincial forest acts, PEPA 1997.

The changes that occur in the Indus delta cannot be generalized to the entire coastline upto Jiwani. The reverse process also is not meaningful since aggregate information regarding whole coasts is not representative of actual changes in a particular area. The diversity all along the coast is relatively high. Therefore, the appropriate application of ICM planning is desired primarily to strengthen the developments made in this aspect

#### 3.1 Coastal Ecosystem – The Geographic Units for ICM

The ICM boundary of a coastal ecosystem includes the 'exclusive resource use zone towards sea'. These coastal ecosystems possess both bio-physical and sociological attributes which are mutually interactive.

**Table 3.1 National Policies, strategies and action plans influencing coastal and marine areas**

A coastal ecosystem is best conceptualized as a socio-ecological system for the purpose of management. This enables understanding of interaction and interdependencies among the (i) biophysical and social process components that constitute a coastal ecosystem, and (ii) the manner in which they are influenced by the cascade of policies from the national to the local level. Policies (Table 3.1) have the potential to both positively and negatively impact the behaviour of a complex coastal ecosystem.

#	National Policies, Strategies and action plans	Year
1	National Conservation Strategy	1992
2	Biodiversity Action Plan	2000
3	National Environmental action plan	2001
4	National Environmental Policy	2005-15
5	National Fisheries Policy	2006
6	National Water Policy	2006
7	National Sanitation Policy	2006
8	Draft National Forest Policy	2010
9	National Energy Conservation Policy	2005
10	Draft National Wetlands Policy	2009

#### 3.2 Ecosystem Based ICM

ICM is a process of searching for the best combination of practices to suit a changing environmental situation in a coastal ecosystem. Today these changes include the consequences of Climate Change, especially sea level rise. Clarity regarding the principles and elements of ICM is therefore useful in understanding the meaning and content of the NSAP.

The goal of ICM is to improve the quality of life of human communities who depend on coastal resources while maintaining the biological diversity and productivity of coastal ecosystems. Therefore, ICM must integrate government with the community, science with management, and sectoral with public interests in preparing and implementing actions that combine investment in development with the conservation of environmental qualities and functions (GESAMP Reports and Studies No. 61, 1996). The scope and focus of ICM is included the UN Agenda 21.

**Principal Features of ICM:** These are summarized below to show the diverse aspects that need to interact and cohere to become a national ICM programme.

**Geographical:** It takes account of interrelationships and interdependencies (viz., physical, chemical, biological, ecological, sociological) between the terrestrial, littoral, beach and coral reef habitats, inhabitants, built environment which constitute a coastal ecosystem;

**Temporal:** It supports the planning and implementation of management actions in the context of a long-term strategy to address change trends in ecosystem structure and functioning;

**Sectoral:** It takes account of interrelationships among the various human uses of coastal areas and resources as well as associated socio-economic interests and values, relative efficiencies of development sectors and their optimization;

**Institutional:** It provides for the widest possible consultation between government, social and economic sectors and the community in policy development, planning, conflict resolution and regulation pertaining to all matters affecting the development, use and protection of coastal areas, resources and amenities.

The main coastal ecosystem trends are generally classified in four classes which suggest the planning options available for addressing them. These are:

- i) maintaining the existing situation;
- ii) restoring equilibrium;
- iii) knowledge acquisition; and
- iv) Environmental Impact Assessment.

All trends have multiple causes and cannot be reduced to simple cause-effect relationships.(Annex III)

## 4. THE NATIONAL STRATEGY AND ACTION PLAN

### 4.1 MFF Strategic Planning and Implementation Framework

The MFF Strategic Planning and Implementation Framework (2006) provides the foundation for action to address the basic problems faced by the coastal areas of Pakistan. The MFF goal and objectives contribute toward the conservation and restoration of coastal ecosystems as an essential part of the coastal development. The MFF objectives are as follows:

- To strengthen the environmental sustainability of coastal development, and
- To promote the investment of funds and effort in coastal ecosystem management for sustainable development..

All the definitions utilized in the NSAP are adapted to be responsive to the objectives of the MFF Programme in the context of the Pakistan. The NSAP is integrated with the National Conservation Strategy and development plans of the Pakistan to ensure that it acquires effectiveness and efficiency by not duplicating ongoing and already planned activities.

The MFF Framework is composed of fifteen (15) programmes of work (POWs) as given in. Fig. 4.1 . These POWs and specific activities are arranged under three themes:

- Building knowledge;
- Strengthening empowerment; and
- Enhancing governance.

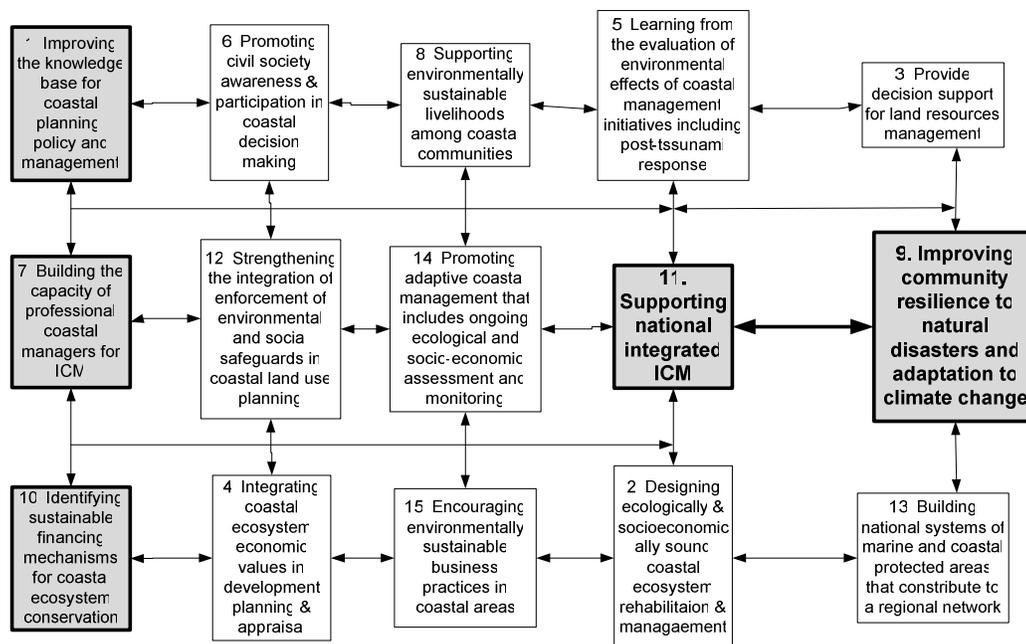


Figure 4.1- A possible set of relationships of the inter-dependent POWs (numbered) focused upon the eventual development of a national ICM programme, and adaptation to climate change (Nos. 9 & 11). The POWs with the heavier borders are the key poles of the ICM process development which also supports adaptation to climate change. The POWs in the NSAP may be sequenced and prioritized in keeping with the decisions made at diverse levels of institutional consultation.

## **4.2 National Strategy and Action Plan (NSAP)**

The NSAP was developed by way of consultations during October – December 2009. Consultation during October 2009 included an NCB meeting and according to its decision a Sub-committee was constituted to prepare a draft Strategy and Action Plan. A draft NSAP was developed and circulated in December 2009. The draft NSAP will be submitted in January 2010 for approval by the National Coordinating Body chaired by the Secretary, Ministry of Environment.

The NSAP will adhere to the guiding principle of inclusive participation in the method of preparation of the coastal area specific action plan under the guidance and supervision of the NCB. Consensus based interventions shall be prioritized for financial support from the MFF Small Grants Fund (SGF) and Large Grants Fund (LGF).

### **(a) Specific Goal and Objectives**

The goal and objectives are in conformity with national policies and priorities contained in the NCS, Provincial Strategies, National Environment Policy, and Biodiversity Action Plan and Strategy. The existing policies and strategies shall require harmonization with the National Vision 2030 and Strategy for Forest Biodiversity Conservation in Pakistan and other National Development priorities.(Table 3.1)

**Goal:** To initiate conservation, rehabilitation and development programmes to ensure equitable sharing of benefits by supporting the ICM approach.

#### **Objectives:**

1. To identify and introduce mechanisms to ensure that the NSAP is able to support ICM in Pakistan..
2. To develop mechanisms for public-private partnerships (PPP) to acquire sustained and equitable economic benefits from coastal development.
3. To stimulate policy commitment towards sustainability of ICM programmes.

### **(b) Key elements of the Strategy**

Under this strategy the MFF's work in Pakistan will:

- Focus on sustainable livelihoods that respect the integrity of the natural environment, while reducing vulnerability and increasing resilience within coastal communities.
- integrate inputs by sectoral specialists, non-government organisations, community based organisations, private sector stakeholders, and local authorities, as expressed by co-management
- treat knowledge as a critical resource that must be continuously expanded through participatory action research, collation, interpretation, and dissemination
- Apply a holistic approach, encompassing environmental, socio-economic and administrative dimensions. This was expressed through terms such as eco-system, landscape, co-management, and multi-stakeholder participatory approaches (Table 3.1). and (Annex I)

Experience has shown that awareness of environmentally sustainable development is not enough in itself to effect change. There must also be both an intention, and the means to do so. The main thrust would be:

- To strengthen the partnership of government, with the private sector and the civil society is essential. Communities need to be empowered to allow meaningful partnership, while the public service sector must demonstrate confidence and trust in the partnership.
- The particular capabilities of NGOs and CBOs will be mobilized to support the participation civil society in achieving National Strategic goals and activities.

- National sectoral institutions like National Institute of Oceanography, Marine Fisheries department, Zoological Survey department, Ports and Harbour Authorities are expected to work through Provincial and lower levels of government.
- National level policies and development norms set standards that are equivalent to specific goals for application in the coastal and marine areas.

**(c) Current issues**

Pakistan faces most of the usual pressures in respect to coastal areas, such as coastal erosion, habitat degradation, overexploitation of resources and population increases that lead to greater risks and vulnerability along the full stretch of coast to meet these problems. However there are the following strategic issues that need to be addressed:

- The use and documentation of local knowledge is essential to any successful achievement of the goals of the MFF on the ground.
- Sustainable development is only possible if the boundaries of functions provided by nature are recognised and environmental resources are maintained.
- Effective mechanisms of coordination among the major custodians of the coastal resources need to be ensured.

**(d) Communication Strategy**

The communications strategy would be prepared to facilitate, the National Coordinating Body (NCB'), its partners, in how they will communicate with the stakeholders- both internally and externally. These will be designed directly into project proposals.

The communication strategy would flow from the objectives set by the NCB to ensure the flow of information between the regional level and project level. It will support the realization of key programme objectives of MFF. In order to align with MFF the NCB Communication Strategy would undergo revision on a need basis to accommodate unforeseen changes. The Strategy will be concentrated on five defined objectives of MFF while addressing local issues at the same time.

**(e) Monitoring & Evaluation Strategy:**

Monitoring and evaluation (M&E) of the consequences of ICM, and the manner in which decision makers and coastal managers use that information will determine success or failure of the NSAP. This information may be used as an opportunity for extracting lessons from actual experience, and for applying them toward improving future endeavor. In due course of NSAP implementation the M&E indicators will be developed in consultation with concerned stakeholders.

## **5. THE MFF PLAN OF ACTION FOR PAKISTAN**

The main thrust of the Action Plan is to operationalise the MFF National Strategy. This includes the specific activities listed bellow. Bodies and individuals mentioned in brackets after inputs, refer to those responsible for the activity or input.

- Establishment of an NCB secretariat, including the employment of a Coordinator and Assistant Coordinator to support the work of the NCB. This is considered to be a critical issue for the NCB's successful operation.
  - **Output:** Establishment of a secretariat with staff including a Coordinator and Assistant Coordinator operating under the direction of the Chairperson of the NCB, a Terms of Reference, equipment and an operating budget.

- **Inputs include:**
  - the identification of suitable individuals to take the positions of Coordinator, and any other necessary support staff (**NCB chairperson and IUCN**);
  - Terms of Reference, particularly for the Coordinator (**IUCN, approved by NCB Chairperson**);
  - Decision on physical location of the Secretariat (**approved by NCB Chairperson**)
  - Decision on budgetary contributions and operations (**IUCN, and NCB Chairperson**)
- The Secretariat will need to gather existing basic information about the geographic focal areas, in order to pursue NSAP. several of the strategies to build knowledge and share experience.
  - **Output:** of this activity is a small reference documentation unit at the Secretariat, including information on all on-going activities and as many as possible completed projects in the geographic focal areas.
  - **Inputs include:**
    - Written material and other audio-visuals on coastal projects in the geographic focal areas from all members of the NCB and stakeholders as appropriate. Subjects should cover all aspects of terrestrial and marine resources, but also socio-economic and demographic work, institutional and capacity building projects, infrastructure projects and EIA studies of proposals in the area (**Assistant Coordinator and NCB members**).
- Finalise the operationalisation of the Small Grants Facility, including adaptation of the Guidelines to Pakistan's circumstances. The Small Grants Facility aims to issue its first call for proposals just after Pakistan becomes a full member of the MFF programme in 2010.
  - **Output** is an operational system, with the verification being a successful call for proposals, review of proposals, acceptance and memoranda of agreements signed.
  - **Outputs** include a formal agreement between IUCN and UNDP on relative roles, responsibilities and budgets.
  - **Inputs include:**
    - Finalisation of the Operational Guidelines (**IUCN with inputs from UNDP**)
    - Agreement reached with IUCN and UNDP on their respective roles and responsibilities regarding the Small Grants Facility (**IUCN and UNDP**)
    - Bank account established, signatories determined, funds transferred and financial reporting agreed upon. (**IUCN and UNDP**)
- Preparation of a large project proposal, for submission to the Regional Steering Committee. Assuming that the pre-proposal is accepted, a full scale project document will be prepared and submitted within stipulated timeframe. The nature of the project will require considerable consultation with local authorities in the region.
  - **Outputs** will include a pre-proposal for in time submission to the Regional Steering group, and upon acceptance, a full project proposal for final approval.
  - **Inputs include:**

- Identification of one or more project ideas (**NCB members**);
  - Drafting a pre-proposal. This requires a project proponent to take responsibility for ensuring the work will be done in time (**project proponent**).
  - Review by the Provincial Steering Committee (**all NCB members**).
  - Drafting full scale proposal with views of affected project beneficiaries and participants. (**Project proponent**)
  - Approval and support of the NCB. (**all NCB members**)
  - Submission to the RSG within the stated deadline.
  
- Arrange first networking event for the NCB, possibly a field trip to study the potential activities in the areas of Thatta, Karachi, Somiani, Ormara, Astola, Gawadar and Jiwani.
  - Output: A comprehensive study trip, with written documentation of the findings.
  - **Inputs include:**
    - Contact with relevant stakeholders (**Assistant coordinator, NCB Secretariat**)
    - Contact with NCB members on suitable timeframes, and features of interest to examine. (**Coordinator, NCB Secretariat**)
    - Make logistical arrangements (**Coordinator, NCB Secretariat**)
    - Arrange for financing the trip (**Coordinator, NCB Secretariat and IUCN**)
    - Preparation of introductory session and debriefing session for participants (**Assistant coordinator, NCB Secretariat**)
    - Production of Study Trip Report (**Coordinator, NCB Secretariat**)
  
- Host a Regional Workshop on Sustainable Management of Mangroves and associated Natural Resources.
  - **Output:** A well organised regional workshop and publication of its proceedings.
  - **Inputs include:**
    - Formation of an organising committee (**NCB, IUCN**)
    - Arrange all logistics for the workshop (**Organising committee**)
    - Request for technical as well as financial support to MFF Secretariat (**Organising committee**)
    - Manage production and dissemination of abstracts, agendas, etc. (**Organising committee, MFF Secretariat**)
    - Manage collation and publication of Proceedings of the workshop (**IUCN/ MFF Secretariat, NCB**)
  
- Participation in Regional activities, including a Regional Steering Committee, training courses.

- **Outputs:** Participation in RSC will help in developing guidelines on future activities/projects and participation in training courses will contribute in increased capacity to use ICM tools more effectively,
- **Inputs include:**
  - Selection of participants (**NCB**)
  - Participation in the revision (if needed) of the Country Strategy and Action Plan incorporating appropriate recommendations of the regional studies.
  - An Country Strategy and Action Plan (**NCB**)
  - Report on progress made on the SGF (**NCB**)
  - Training course, Selection of participants (**NCB Chairperson**)
- Development of a communication strategy to cater the communication need of the NCB and the MFF.
  - **Outputs:** To establish and strengthen the flow of information between the NCB and MFF the Communication Strategy will be necessary.
  - **Inputs include:**

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## ANNEXURE I

Table 1a. National legislation related to Environment with particular references to coastal marine areas.

#	Laws	National Nomenclature	Regulatory Body
1	<b>Umbrella Environment Act</b>	Pakistan Environment protection Act 1997	Ministry of Environment Local Govt. and Rural Development
2	EIA and IEE	Pakistan Environment protection Act 1997	Federal and Provincial EPA's
3	Coastal Legislation	Coastal developmental Authority Acts Sindh 1994 and Balochistan 1998.	Provincial Coastal Development Authority
4	Marine Pollution	Pakistan Environment protection Act 1997	Federal and Provincial EPA's and Port Authorities.
5	Coastal Forest, Mangroves	Forest Act 1927	Sindh and Balochistan Forest and Wildlife Departments.
6	Flora, Fauna & wildlife (incl. Corals)	State Wildlife Protection ordinances of 1972 in Sindh and Balochistan.	Provincial Forest and Wildlife Departments
7	Mining Law	West Pakistan Mines and Mineral Development Act, 1958: Balochistan Mining concession rules 1970.	Mineral Development Authority.
8	Ports	Ports Act, 1908 Karachi Fisheries Harbour Ordinance, 1984;  Karachi Port Authority	Karachi Port Trust, Fish Harbor Authorities and Port Qasim Authority.
9	Land Use	Land Acquisition Act 1894	Ministry of Environment Local Govt. and Rural Development. Land Revenue Departments under Provincial Governments
10	Fisheries	Provincial fisheries Ordinance	Sindh and Balochistan Fisheries departments and Marine Fisheries department.
11	EEZ	Territorial Waters and Maritime Zones Act 1979	Pakistan Maritime Security Agency, Pakistan Coast Guards, Port and Harbor Authorities.

Source:(R.Rajagopalan and A. Lakshmi 2003) and (Pernetta, 1993)

## ANNEXURE II

Table 2a. International obligations related to Coastal and marine areas

#	Treaties	Established at	Year	Signed by Pakistan	Known as
1	Convention on the Conservation of Migratory Species of Wild Animals	Bonn	1979	1987	CMS- Bonn Convention
2	Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	Washington	1973	1976	CITES
3	Convention on Wetlands of International importance especially as Waterfowl Habitat	Iran	1971	1976	Ramsar
4	Convention concerning the Protection of the World Cultural and Natural Heritage	Paris	1972	1972	World Heritage Convention
5	United Nations Convention on the Law of the Sea	Montego Bay	1982	1982	UNCLOS
6	UNESCO Man and Biosphere (MAB) programme	Paris	1968	Supports	MAB
7	International Convention for the Prevention of Pollution from Ships		1973/78		MARPOL
8	UN Convention to Combat Desertification	Bonn	1994	1997	UNCCD
9	Convention of Biological Diversity	Montreal	1992	1994	CBD
10	UN Framework Convention on Climate Change	Bonn	1994	2005	

Source:(R.Rajagopalan and A. Lakshmi 2003) and (Pernetta, 1993)

## **ANNEXURE III**

### **Initiatives related to the coastline of Pakistan**

#### **Coastal Environment Management Plan for Pakistan (CEMP 1996)**

The Coastal Environmental Management Plan (CEMP) for Pakistan was prepared in 1996 by Economic and Social Commission for Asia and the Pacific (ESCAP) in collaboration with Government of Pakistan. The CEMP was never implemented, however covers a large variety of subject relating to coastal zone development and management. The physical setting, ecology and status of living and nonliving resources, development potential, associated problems of sanitation and pollution- all relevant aspects have been described which has a pervasive bearing on the entire ambit of coastal zone development, protection and management planning.

#### **Balochistan Conservation Strategy (2002)**

In 2000 Balochistan Conservation Strategy highlighted the serious threats which confront the coastal and marine areas of Balochistan, Conservation efforts for the marine environment have been lagged far behind for the terrestrial environment, and an integrated approach to the management of the marine ecosystem is yet to be implemented.

Recognizing these problems, a number of areas have been proposed for protected - area status. represented as important for nesting green turtles on a sandy beach and rich marine fauna in the surrounding waters. It used to have diverse wildlife populations with large numbers of over- wintering and nesting birds. The sand scaled viper *Echis carinatus astolae* .Ormara turtle beaches, Jiwani turtle beaches, Astola Island and Miani Hor have already been declared as Ramsar sites and further worth for investigation for CMPAs.

#### **Balochistan Programme:**

The Balochistan Programme was the follow up of BCS.This initiative was implemented by IUCN Pakistan in Partnership with Government of Balochistan It was a five year programme with three major components i) District Governance ii) Integrated Water Resource Management iii) Coastal Conservation. The programme had its strong presence in the coastal district of Gawader in Balochistan; where the programme was able to help in development of District Vision for Gawader and simultaneously able to establish mangrove plantations.

#### **Balochistan Partnerships for Sustainable Development:**

Capitalizing on the success of Balochistan Programme which resulted in the form of BPSD (Balochistan Partnerships for Sustainable Development). This initiative is also implemented by IUCN Pakistan with the help of partners including Government of Balochistan. The work which has been done in Balochistan Programme has been upscale and the success stories are replicated.. The response is positive and the partnership is gaining more popularity among the stake holders.

#### **Pakistan Wetlands Programme**

Pakistan Wetlands Programme. The Programme is implemented by WWF- Pakistan and the Federal Ministry of Environment. The main programme objective is to deal with the protection and conservation of Wetlands; acknowledging the vital importance of the coastal area, The Programme identified Makran Coast Wetlands Complex project stretching westwards from Basol River to Jiwani on the border of Iran as an effort towards recognition as protected area.

The project has many phases of implementation, mainly to enhance the capacity of conservation agencies to protect the area in context of wetlands through an enhanced policy framework. the establishment of effective management mechanisms, an awareness campaign is envisaged to create conditions conducive to the replication of proven conservation techniques.

The project will reduce threats to biodiversity. The goal of conservation initiatives within this project is closely tied to community involvement. A reduction in anthropogenic threats has been foreseen through community agreements on limiting resource-use and investment in livelihood diversification ([http://www.gefweb.org/Documents/Work\\_Programs/wp\\_Jul03/Executive\\_Summary7.pdf](http://www.gefweb.org/Documents/Work_Programs/wp_Jul03/Executive_Summary7.pdf))

**Indus for all programme:**

Indus for all Programme is being implemented by WWF Pakistan and one of its project sites is in Keti Bandar. This project is also aimed at the conservation of coastal resources, community mobilization and providing alternate sources of energy to local people to reduce burden on coastal mangroves and other resources.

**Sindh Coastal Community Development Project**

Sindh Coastal community Development Project (SCCDP) is being implemented in the Coastal areas of Karachi, Thatta and Badin by Sindh Coastal Development Authority (SCDA) through Forest, Fisheries Departments and NRSP. This project is aimed at mobilizing coastal communities, restoration and rehabilitation of coastal resources including mangroves and fishery products.

**Aquaculture & Shrimp Farming Project (GOP-FDB)**

This is a recently approved Programme. Implemented by Fishery Development Board and Government of Pakistan. The operational area of the programme would be along the whole coastline of Pakistan.



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.

MFF's vision is a healthier, more prosperous and secure future for coastal communities. 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](http://www.mangrovesforthefuture.org)**