

## **Brief on Environmental Problems of the Marine and Coastal areas**

Pakistan is located at the gateway of the Persian Gulf. It is close to Iran, Oman, India and the land-locked central Asian countries. Pakistan is thus providing a good opportunity to benefit from its geo-strategic position. However, the increasing levels in the coastal regions and degradation of marine resources of the country are emerging as important environmental threats need immediate action. Pakistan has a coastline about 990 km along with adjacent coastal zone of 240,000 square km in the Northern Arabian Sea, which can be explored and developed into new ports, tourist resorts and industrial sites. It comprises of two distinct units, the passive margin of Sindh which stretches over 370 km and the active margin of the Balochistan coast which stretches over 760 km. Pakistan occupies a very important position on the vital trade and oil supply routes from the Persian Gulf to Pakistan's location is also not far from the Red Sea. This geographical location provides an opportunity to Pakistan to dominate the crucial stretches and vital routes across the Arabian Sea. There are rich living and non living resources in the coastal zone of Pakistan. The living resources include mangrove forests along Sindh and Balochistan Coast with Indus Delta harboring 6<sup>th</sup> largest mangrove forest of the world. The commercially important marine fisheries resources of Pakistan are composed of about 350 different species. Associated with Pakistan's coastal ecosystem is a complex array of natural resources which provide economic goods and services. These goods and services are both marketed, e.g. fish, shellfish and non-marketed, e.g. mangroves for their medicinal uses and their functions as nursery areas for juvenile fish and buffers against storm surges. These goods and services have an extremely important long term strategic value.

### **Economics and uses of coastal areas**

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. The following sectors of economy make use of the coastal and marine environment in Pakistan.

- Ports and shipping
- Fisheries and forestry
- Communication and roads
- Coastal agriculture
- Boat Building
- Ship building
- Oil and gas mineral exploration,
- Salt industries and mineral industries
- Coastal tourism
- Pollution control management
- Coastal power plants and Energy sector.

The coastal and marine areas of Pakistan produce about 596,980 metric tons of marine fish and 25,000 metric tons of shrimp while it exports about 131,000 metric tons of fish worth Rs. 7.272 billion. There are other Port Qasim, Gwadar and some small Jettys. 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.

## **ENVIRONMENTAL ISSUES**

There are number of environmental issues in the coastal zone of Pakistan which have a direct bearing on public health in the coastal areas. The poor sanitation, poor drinking water supply and disposal of untreated sewage and domestic wastes and untreated disposal of industrial effluents causing contamination, pollution and public health risks. The Karachi coastline's growing pollution level, which is tied to the increasing volume of trade via the shipping industry through the Karachi Port, is severely contaminating the mangrove forests and marine life in the area. The government is now faced with the complex problem of encouraging the upswing in trade to foster economic growth while at the same time attempting to contain the environmental damage that ensues with these new opportunities.

### **Marine Pollution:**

The coastal development activities involving manmade alterations of the coastal environment have also accelerated the impacts of pollution leading to the deterioration of coastal environmental quality, depletion of coastal resources, public health risks and loss of bio-diversity. Pakistan is examining the feasibility of developing an "energy corridor" for transporting oil products to China and Central Union via Pakistan. P.R China is now engaged in the construction of a deep channel port in Gwader and Pakistan plans to develop it as a trade and energy corridor with China and Central Asia. All these activities will exert negative impact on the fragile marine ecosystem.

### **Industrial pollution:**

The pollution problems have arisen due mainly to the indiscriminate discharge of effluent from industrial and agriculture sources and disposal of untreated liquid and solid wastes generated from domestic sources into the coastal environment. Karachi has about 8000 small and large industrial units. This can be grouped into different industrial zone. These include Sindh Industrial Trading estate (SITE) in North, Landhi Industrial Estate (LITE) in the east, Korangi Industrial Area (KIA) in the south, and the Hub Trading Estate (HITE) between Karachi and Gadani in the west, along Balochistan Coast close to Karachi. A significant percentage of the coastal pollution is contributed when the export industries ship their goods through the Karachi Port. The port induces polluting industries to set up shop nearby in order to expedite exportation. The pollution from these industries is affecting the environment because much of the factories' effluent is untreated and released directly into the port area. The 1991 Pakistan National Environmental Plan estimates that three main coastal industries located near the port with the largest volumes of effluents are the steel mill, power plants, and refineries and notes

that many smaller industrial units are having more significant polluting effects on the marine environment. In addition to the growing export industries contribution to the pollution, trade activity in the Karachi Port is expected to rise steadily. Moreover, because "recent changes have led to a major realignment in trading patterns in the region leading to the expansion of the Economic Cooperation Organization(ECO) to include the Central Asian states and Afghanistan along with Pakistan, Iran, and Turkey...Pakistan stands already committed to provide a suitable deep water port for the landlocked countries of the ECO." Without improvements in the shipping industry, pollution is overburden the environment along the Karachi coastline. The heavy metals are being accumulated in the sediments and marine organisms. The accumulation of eight heavy metals (As, Cd, Co, Cr, Cu, Hg, Ni, Pb and Zn) in the fauna of coastal waters of Karachi is especially in higher concentration in marine organisms comprising of resident fauna of the polluted localities. Some of the marine life was contaminated with lead, which if consumed by humans through seafood, has been linked to anemia, kidney failure, and brain damage.

### **Shipping of Oil:**

Major sources of oil pollution along Pakistan coast are oil refineries and shipping traffic, mechanized fishing fleet and oil terminals at Karachi Harbour, Port Qasim, and occasional oil spills. 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 and there exists no oily ship waste reception or treatment facility within the port. Dredging is the process of removing the silt buildup in the port from the entering and exiting of the ships. The dredged material is dumped out to sea to maintain the port. However, there is no system for monitoring trace metal in the dredged spoil which is likely further deteriorating the environment. Oil spills are a continual hazard when importing oil, which Karachi Port does in great quantities. In fact, oil importation is project to steadily increase due to the country's urgent need for more energy production.

### **Mangroves:**

Mangroves along the Pakistan's 990 km coastline occur mostly along Indus deltaic region along Sindh Coast and a few areas along Balochistan Coast. Pakistan is heavily dependent on these mangrove forests to maintain the ecological balance. For example, the mangrove leaf litter provides a major source of nutrients. The mangroves provide a diverse habitat for a complex and interdependent community of invertebrates, fish, birds, and reptiles; and the primary productivity of these mangrove-covered deltaic areas are four to seven times those of coastal areas without mangroves. Of a global concern is that the South Asian waterfowl seek food and shelter in these estuaries and mangroves. In addition, most of the tropical marine--such as the commercially important shrimp species seek shelter in the mangroves for one stage of their life cycles.

### **Ship breaking Industry**

Provide scrap steel and other scrap metals for foundries and scrap wooden products etc. for a variety of reuse for local industry. The ship breaking industry at Gadani has been a prominent source of pollution because of the booming business of ship-breaking along the coast of Gadani particularly during 1970s. This industry has been the biggest source of heavy metal pollution in the area. In addition, waste oils, bilge oils, and other waste products are also discharged directly into the inter-tidal area on the beach at the sea front.

### **Economic Losses**

The economic losses to future generation from degradation of coastal environment and natural systems will be immeasurable. This will be reflected in loss of agriculture land close to the coast, loss of biodiversity, dislocation of coastal communities, loss of livelihood, loss of fisheries, pollution of beaches and recreational facilities, decline in tourism. The ultimate goal of integrated zone management is to promote national development through the rational use of the coastal resources and environments of Pakistan in a manner which balances economic, social and environmental goals. Pakistan is a signatory to a number of conventions, protocols and international treaties that include:

- Convention on biological Diversity, (CBD),
- MARPOL,
- Convention on trade of endangered Species (CITES),
- The Pakistan Fisheries Ordinance,
- International Seabed Authority (ISBA),
- RAMSER Convention,
- Kyoto Protocol etc.

### **Setting Management Objectives for Priority problems:**

- To protect and maintain critical stocks of coastal resources from harmful affects of industrial and urban contaminants and the oil.
- Ensure treatment of industrial wastes by enforcement of existing and appropriate new environment legislation.
- Provide incentive to help treatment of industrial wastes and their environmentally safe disposal.
- Ensure use of low lead oils product, furnace oil, petrol, and diesel.
- Enforce strict environment controls at oil refineries and oil terminals and bunkering points to check oil spillage.
- Protect coastal resources, coastal structures (i.e. ports, harbours, seawater, intake of coastal power plants and industries etc.), beaches and amenities from accidental oil spills.
- Adopt environmentally safe and efficient solid waste management in the coastal towns and cities with special emphasis on Karachi city.
- To improve existing environmental legislation to cover all aspects of pollution control management.

- Foster development and conservation of biological diversity under wetlands, mangroves forests and deltaic environment.
- Promote research to conserve mangrove forest and associated ecosystems.
- Develop sea farming in region where agriculture is not possible.

There is a need to constitute a high level inter-ministerial steering committee to develop and coordinate the implementation of national plans for integrated coastal area management. The committee should be assisted by provincial high level steering committees who should look after coordination and implementation of provincial plans for coastal area management and sustainable development. .

### **Efforts to be made:**

- Pakistan has developed a draft for National Action Plan (NAP) on Environment for the protection of Marine environment from land based activities. National Action Plan of Pakistan has been prepared by a team of local experts identified by the Ministry of Environment, local government and rural development, government of Pakistan. The important role of environmental assessment (EA) in integrated coastal zone management is recognized.
- In 1994 the government set up the Marine Pollution Control Board (MPCB) to supervise and implement pollution control and prevention measures along Pakistan's coastline. A well coordinated national programme of monitoring marine ecosystem and biodiverse designated protected areas, should be initiated.
- National Institute of Oceanography established in 1981 in Karachi by Ministry of Science and Technology, Government of Pakistan. NIO also has a research station at Gwadar Baluchistan coast. NIO in a relatively a short period of its existence has made optimum use of the limited resources. It has initiated, conducted and completed a number of projects related to ocean research and has effectively responded to a wide variety of user's requirements, that is marine industry and national institutions involved in the field of marine research.
- Pakistan's maritime sector is a vital component of our national economic and military power. The Government of Pakistan has approved National Maritime Policy of Pakistan.
- The Sindh Wildlife Management and Worldlife Fund for Nature (WWF) have initiated a protection and research program to conserve the turtles, their eggs and hatching at their habitats.
- The National Oil Contingency Plan is based on the essence provide vide international obligations inter-alia the International Convention on Oil Pollution Preparedness, Response and Co-operation, 1990 (OPRC-90), to which pakistan is party.