

# Rehabilitation of Mangroves along the Arid Coast of Pakistan



Muhammad Tahir Qureshi  
Coastal Ecosystem Expert



# Key points

- Biologically coastal zone is one of the most productive area and important assets of Pakistan.
- Export of shrimps and fishes yield on an average a sum of Rs. 8.8 billion per annum.
- The growth in the coastal areas is higher (3.3 percent) as compared to the non coastal areas (2.7 percent).
- C & M areas with their fisheries , minerals, oil and gas are contributing towards national growth and development.
- Shipping line in North Arabian sea are considered to be among the busiest in the world.
- Mangroves have proved to be the first defence line against all natural disasters.

# ***Distribution of Mangrove Forests along the Coast of Pakistan***



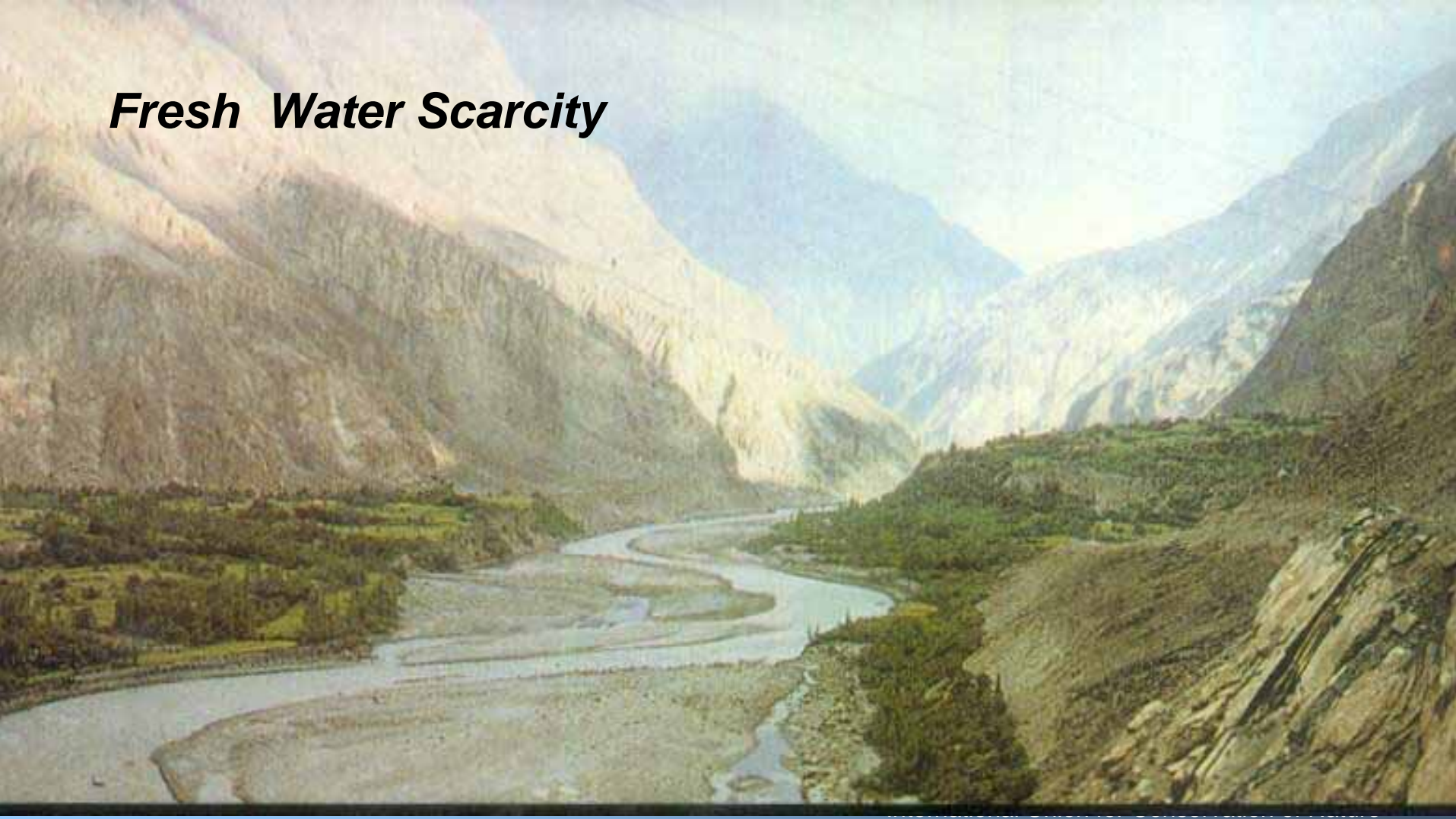
<u><b>Mangrove Categories</b></u>	<u><b>Year</b></u>	<u><b>Area in Hectares</b></u>
1. Dense, normal and sparse mangroves vegetation	1966	604,870
2. Dense, normal and sparse vegetation	1986	440,000
3. Dense, normal and sparse vegetation	1992	160,000
4. Dense, normal and sparse vegetation	2003	86,000 (approx.)

Source : Coastal Environmental Management Plan for Pakistan, UNESCAP, GOP

# Key Reasons for Mangrove Degradation



*Fresh Water Scarcity*



# Average Annual & Seasonal Discharge Volumes Downstream of Kotri Barrage



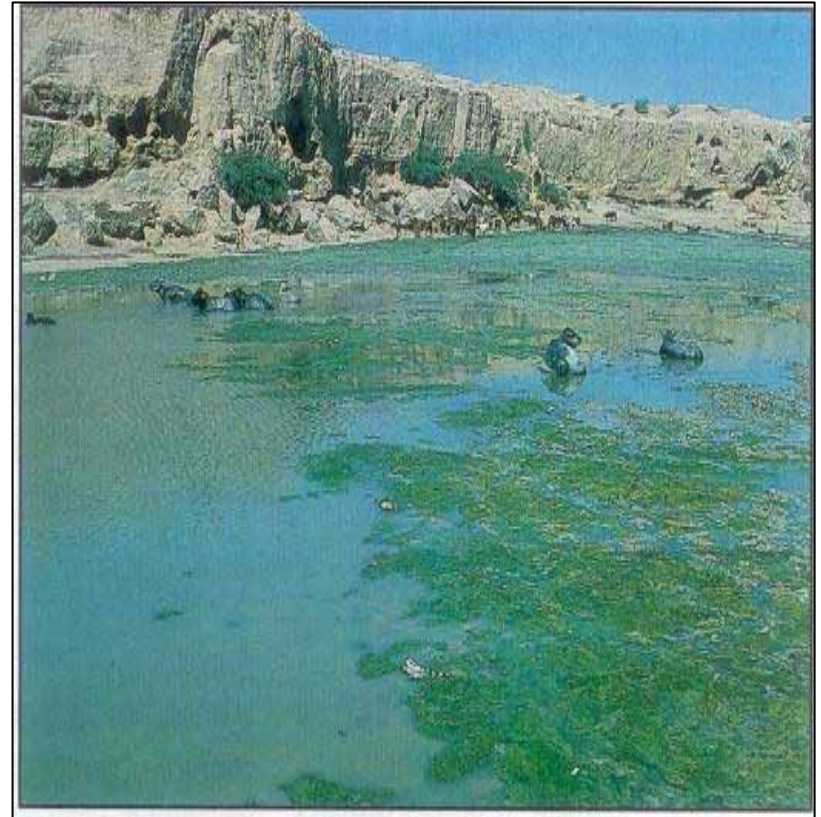
Period	Discharge Volume MAF			Percentage Reduction	Construction with Year	Silt Load
	Annual	Kharif	Rabi			
1880-92	150.0	-	-	-	Canal System	400.0 million tonnes
1940-54	84.7	73.8	10.9	10.0	Sukkur Barrage 1933	225.0 million tonnes
1955-65	79.9	69.7	10.2	12.9	Barrages : Kalabagh (Jinnah) 1955 Kotri – 1955 Marala – 1956 Taunsa – 1958 Guddu – 1962	220.0 million tonnes
1966-76	46.0	44.4	1.6	45.7	Warsak Dam – 1965	133.0 million tonnes
1977-92	35.2	33.1	2.1	58.4	Tarbela Dam – 1975	100.0 million tonnes
1992 onwards	10.0	-	-	-		30.0 million tonnes

Source: Irrigation and Power Development

# Key reasons for Mangroves Degradation



***Waste disposal and pollution***





# Key Reason for Mangroves Degradation

## *Marine Pollution*

**Municipal Waste**      **104 million gallons/day**

**Industrial Waste, Tanneries**

**Power Plants, Steel Mills,**

**Harbours, Ports etc**

**157 million gallons/day**

**Oil Pollution**

**1.5 million tons/year**

International Conventions relating to Sea

**MARPOL 73-78**

**Prevention of Marine Pollution by Dumping of Wastes and other Matters**

**Oil Pollution Preparedness, Response and Cooperation Control of**

**Transboundary movement and hazardous waste and their disposal.**

Laws Relating to Pakistan

**Pakistan Penal Code 1861**

**Port Act 1905**

**Factories Act 1934**

Regulating Bodies / Agencies

Maritime Security Agency (MSA), Sindh and Balochistan

(Environmental Protection Agencies), Port Authorities, Fish Harbour Authorities

**Source: Karachi Development Authority (Defunct)**

# Key reasons for Mangroves Degradation



***Improper management  
and over exploitation***



# ***Ecological Implications of Destruction/Depletion of Mangrove Resources***



## ***Increased Coastal Erosion***

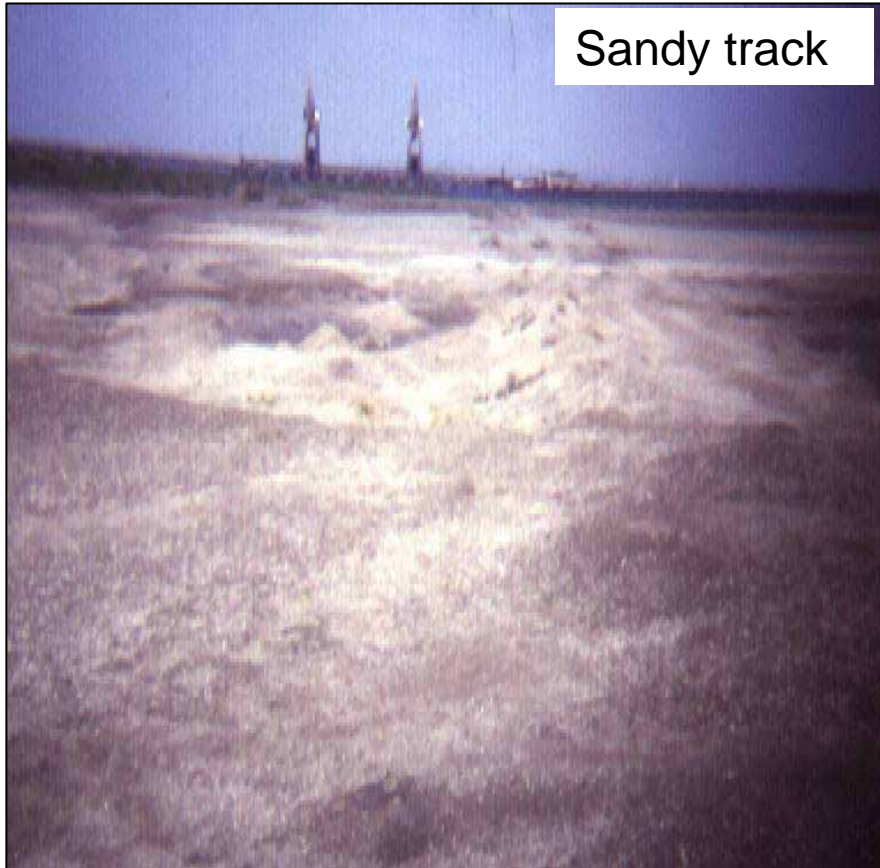


# ***Ecological implications of the Destruction of Mangroves***

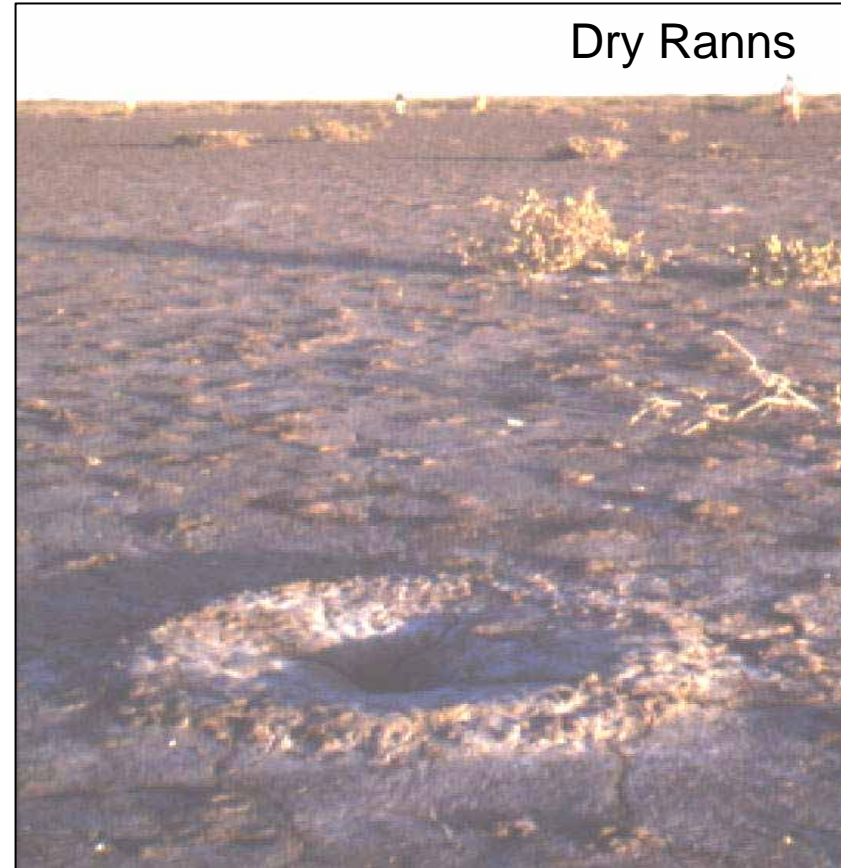


Change in condition and composition of the crops.

Sandy track



Dry Ranns



# ***Ecological implications of the Destruction of Mangroves***



## ***Ecological Disaster - Sea Intrusion***



# ***Ecological implications of the Destruction of Mangrove***



- ***Recurrence of cyclones – Loss of life and property***
- ***Acidification of Soil***

# ***Mangrove Rehabilitation Programmes in Indus delta and Balochistan Coast***



***Replanting 1985-2008 : 30,000 hectares***



**Plantation**



**Nursery**

**Organizations involved –**

**IUCN-Pakistan, Sindh & Balochistan**

**Forests Department, Shirkat Gah, WWF**

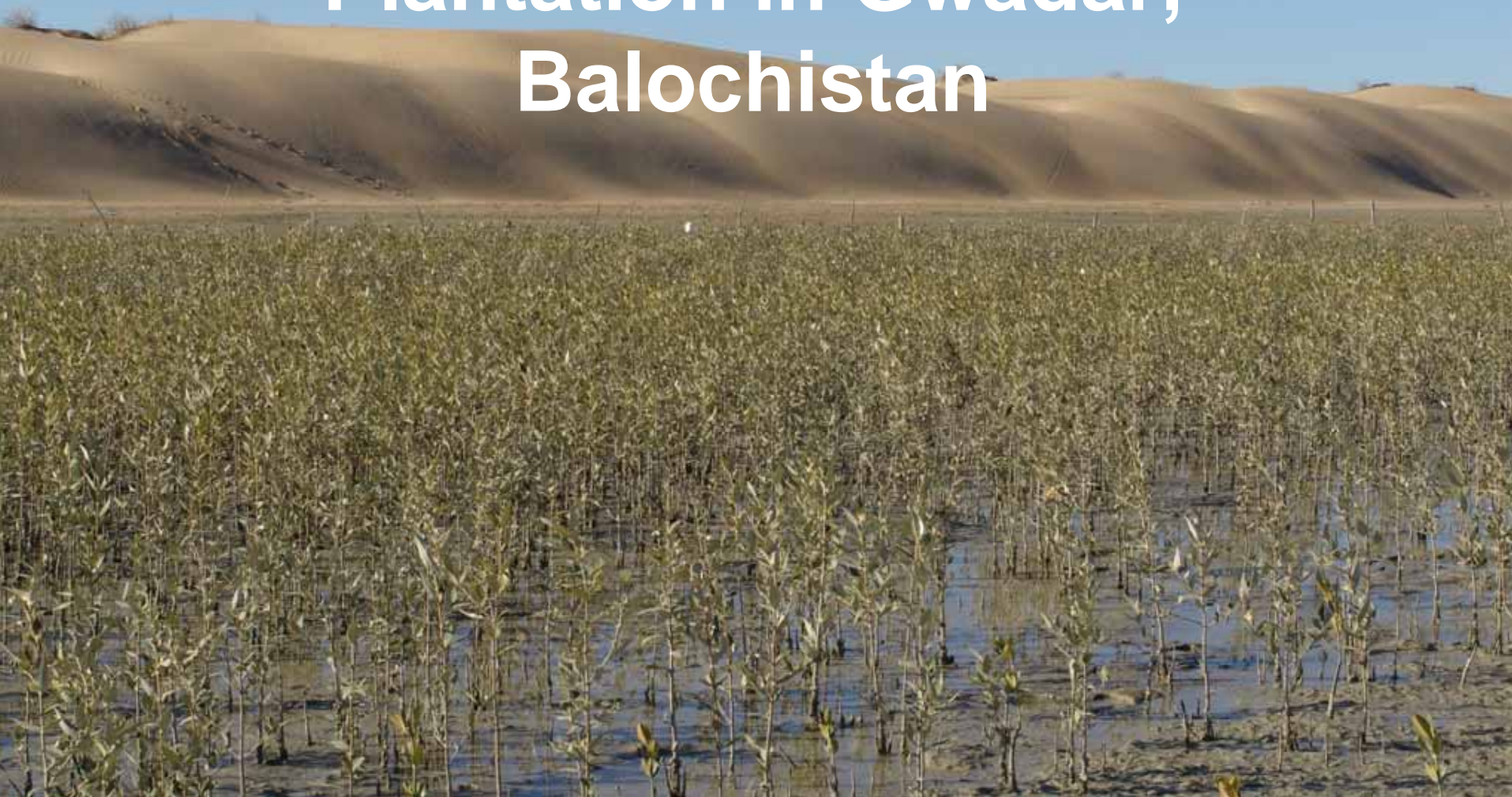
**International Society for Mangrove  
Ecosystem (ISME), Coastal communities**

**Gwadar Development Authority (GDA)**

**Coastal Development Authority (CDA)**



# Protective Mangroves Plantation in Gwadar, Balochistan



# Creation/Development of new mangroves areas in Pishukan Bay, Shadi Kaur Pasni, Sawar and Hingol National Park



Transplanting of *R. mucronata* propagules



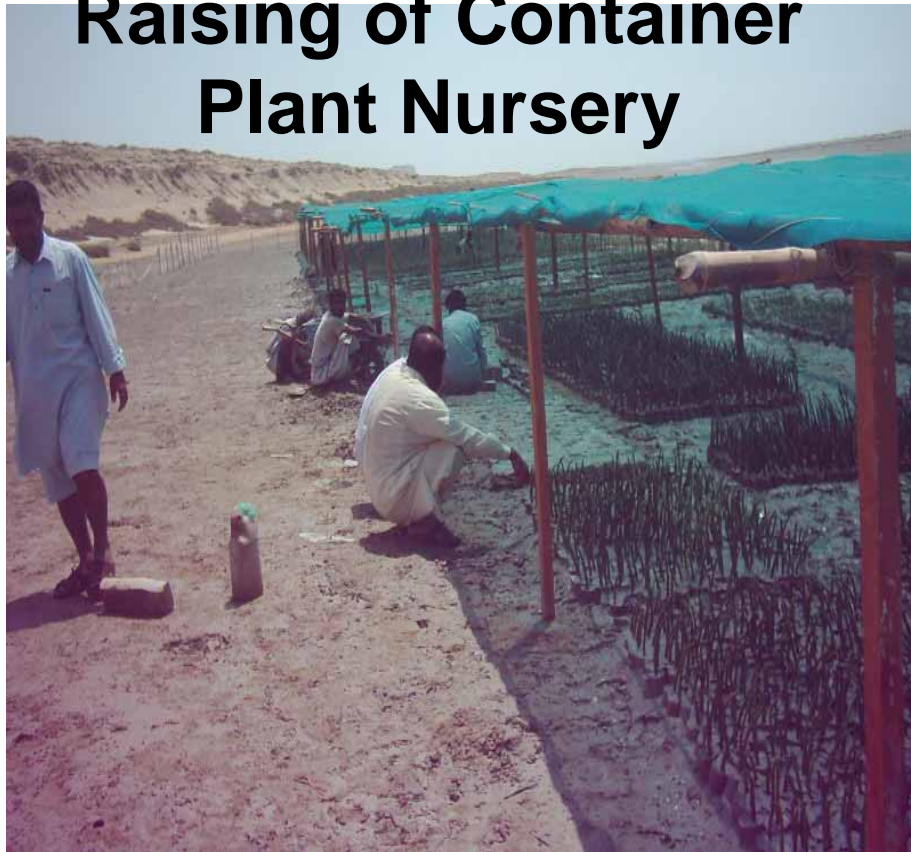
2 year old *A. marina*



# Rehabilitation of degraded mangroves areas



## Raising of Container Plant Nursery



## 4-months old Nursery



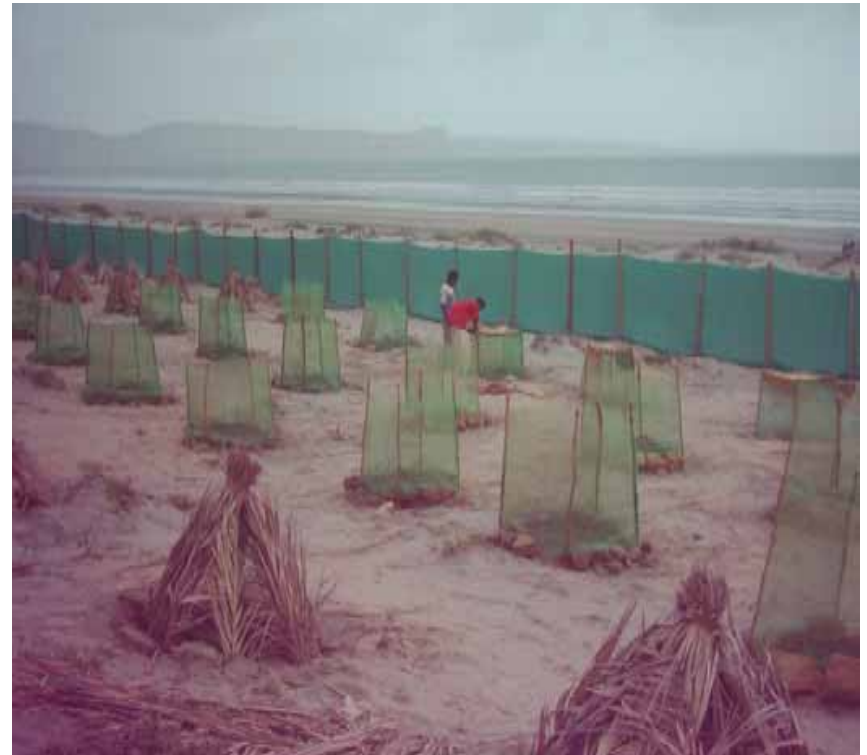
# Improving livelihood of local population through involving in mangroves rehabilitation work - Green Village



- Participation of community



- Shelter belt Mangroves Plantation



# Improving livelihood of local population through involving in mangroves Ecosystem work



- Establishing Integrated Aquaculture/Fish farms near coastal villages



# Capacity Building - Forest Department, Balochistan Coastal Development Authority and Gwader Development Authority



Teaching Silviculture in the  
classroom

Field training session



# Positive Impacts



- Resulted in improved social cohesion and participatory decision making
- Created awareness about conservation and sustainable development
- Trained and experienced manpower available within communities, governmental organizations and non-governmental organization.
- Improvement in micro and macro environment of the coast.
- Increase in forestry and fisheries resources.

# Lesson learnt



- The Mangrove project should be well conceived with sufficient flexibility and long term.
- High quality managerial and technical capacity is a pre-requisite for its success.
- Stakeholder participation at activity identification, implementation and monitoring and evaluation stages leads to positive outcomes.
- Problems due to frequent transfer/ changes of staff specially in government agencies.
- Problems due to rough terrain, climate and political uncertainties and insecurity.

A photograph of a sunset over a field. The sun is a bright yellow circle in the center of the sky, casting a long, shimmering reflection on the ground. The ground is a mix of dark and light patches, possibly a field of low-lying plants or a wet surface. The sky is a gradient of orange and yellow, fading into a darker blue at the top. The overall mood is peaceful and serene.

# Thanks