

Kutch Coast –People, Environment & Livelihoods

Study jointly conducted by
Fishmarc & Kutch Nav Nirman Abhiyan
with support from
FES (Foundation For Ecological Security)

Project Funded & Supported
Sir Jamshedji Tata Trust

Draft report for discussion during workshop held in Kutch
on 7th, 8th Jan'2010

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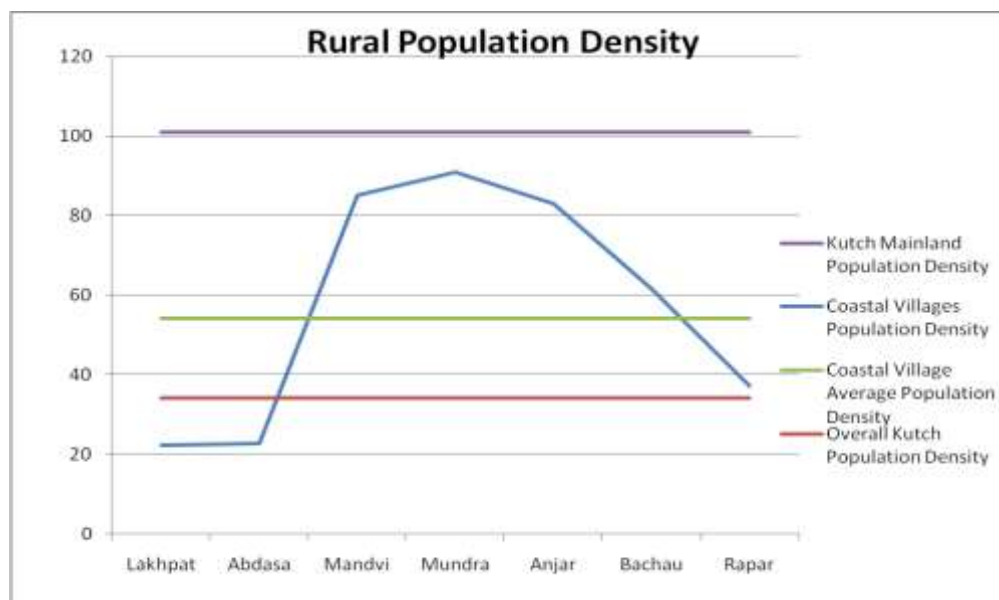
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Chapter 1: Every Desert has Oases

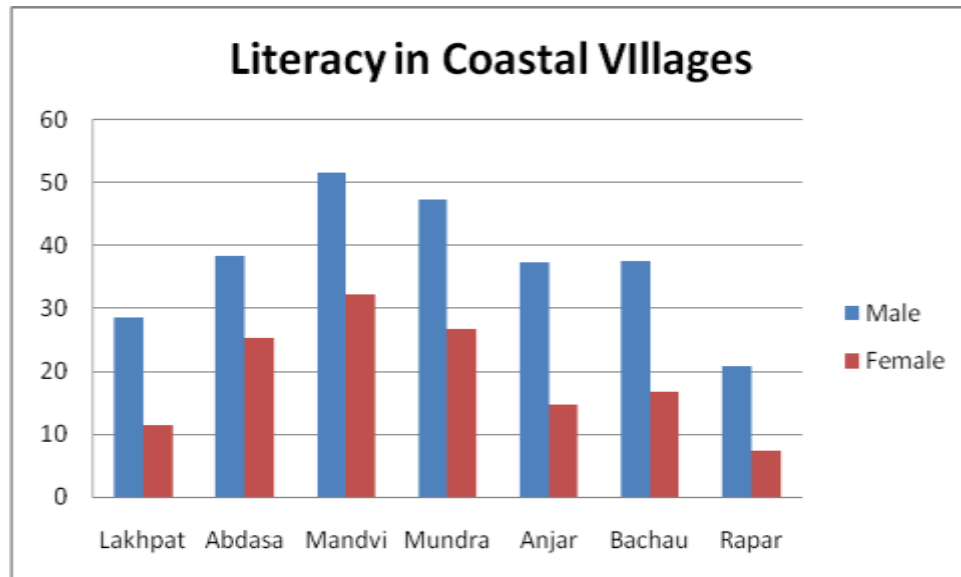
Kutch is the Largest District in India with a total area of 45652 sq km. Out of this, the Rann of Kutch or salt desert occupies nearly 30,000 sq km or nearly 2/3rd of the area. As per 2001 census, total population was estimated as 15,83,225. With a population density of nearly 101 persons per sq km, the Kutch mainland (excluding RANN) is sparsely populated with population density lower than Gujarat's rural population density of 166.



The Taluk wise graph of Rural Population density of coastal villages is shown below.



The literacy levels in the coastal areas is low, as shown in the following graph



Interpretation of the above graphs leads to the following observations:

1. Presence of large vacant tracts in Kutch coast, especially in Lakhpat, Abdasa, Bhachau, Rapar Taluks.
2. Presence of relatively densely populated rural areas in Kutch Coast. The Mundra-Mandvi area has the highest concentration of rural people in the entire Kutch coast.
3. Since rural population is concentrated in areas which support traditional livelihoods, there is likely to be conditions that are conducive to traditional livelihoods in some areas on Kutch coast, especially Mundra, Mandvi etc. Also, since literacy can be linked to disposable income, the disposable income in the Mundra Mandvi areas is relatively higher.
4. Though, overall, Kutch has a population density of 34 persons / sq km, which indicates desert like conditions, there are green areas as indicated by the variation in population density.

Kutch Coast – One of many Oases in Kutch

Kutch Coast is one of the rare ecological zones in the world having rich bio-diversity. It comprises of mangroves, Coral reefs, Mudflats, Seaweeds, Commercial Fishes and several rare marine species. The mangroves of Kutch are the second largest after the Sunderbans in the mainland of India. A prominent feature of the Kutch Coast is the vast intertidal zone comprising a network of creeks, estuaries and mudflats. The Kutch coast provides conducive environment for several sea based traditional occupations like fishing, salt making apart from land based occupations like agriculture, horticulture and animal husbandry.

The Kutch coast is an ecologically sensitive zone as it supports vast areas of Mangroves, Corals, mudflats and the various components of the ecology are interlinked into a fragile ecosystem. The mangroves help the ecosystem by contributing to the oxygen Budget and in Soil Conservation. Mangroves and Corals are the nursing grounds for a variety of economically important fishes, exotic coral fishes and innumerable flora and fauna. The gulf also abounds in more than 210 species of algae. These algae in combination with corals and mangroves provide a conducive ecosystem for diverse flora and fauna.



The significance of mangroves in coastal ecosystems is undebatable. The Government of India and the Ministry of Environment and Forests recognise that mangrove forests are ecologically sensitive areas and need to be protected and conserved. Mangroves are critical to marine coastal soil conservation, breeding and nursery grounds for fish, crustaceans and other sea life, as well as vital habitat for birds and other wildlife. As per estimation, just 100 cu m of mangrove area shelters 54,600 prawns. Kutch district has been declared the most important mangrove areas in the state of Gujarat.






The intertidal zone is unique and very important because the fishermen can land their boats in these natural creeks and also keep them there safe from strong winds and currents. The fisherfolk have complete knowledge of the sea and have been living on the coasts for ages. They are familiar with the creeks of the area and the intertidal zone is important for their occupation, economic prosperity and survival of their families. The creeks also form a natural drainage system which if disturbed might lead to flooding during monsoons.

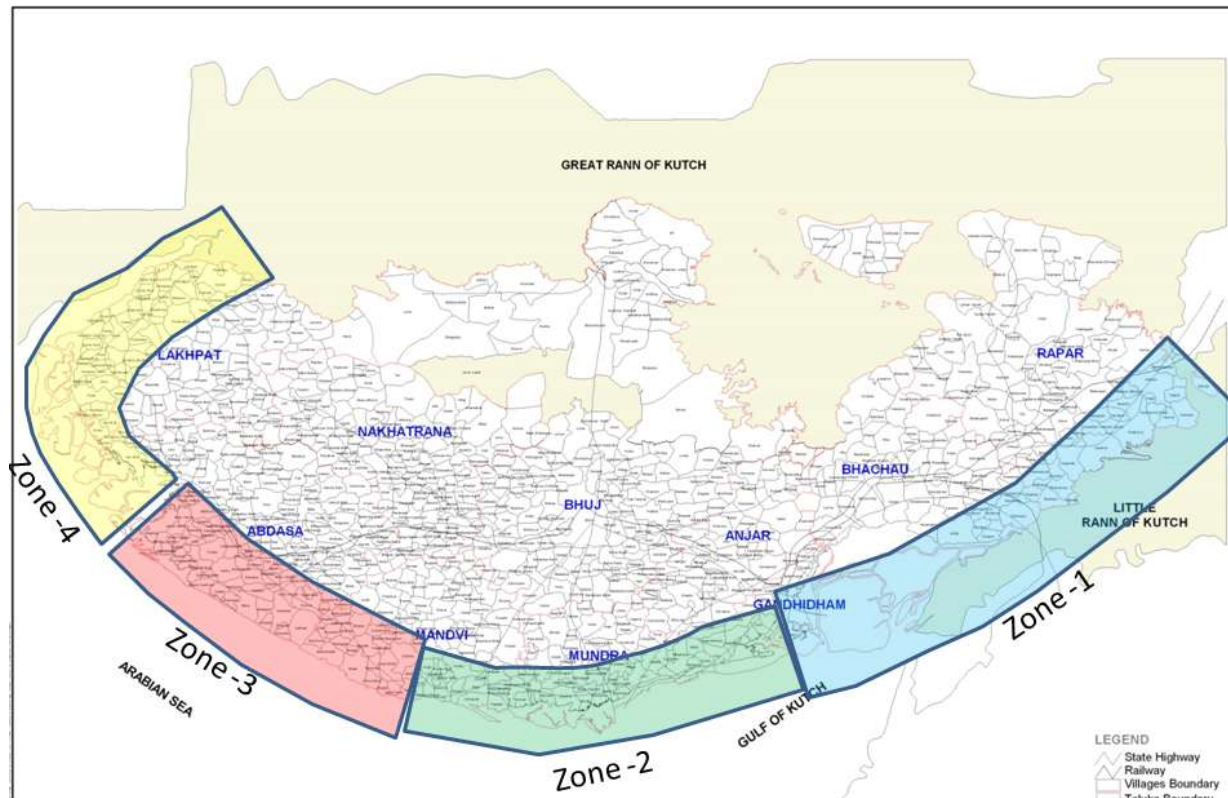
Gulf of Kutch is the only place left along the Indian coast after Gulf of Mannar where live corals occur. In 1982, parts of the Gulf area were declared as a Sanctuary and Marine National Park. Recently, scientists have discovered patches of live corals near Mundra coast.

The large tracts of mudflats provide space for developing saltpans. Scientists have also identified vacant sites along the Kutch coast which could be used for industrial development without significantly affecting the environment or traditional livelihoods.

Upon close observation of the Google earth image of the Kutch coast, the entire coast can be divided into zones on the basis of the intertidal zone and geographical characteristics of the 2 km area from the coast line. The four zones of the Kutch coast are divided as follows:

	<p><u>Zone 1: Bhachau, Gandhidham</u></p> <ul style="list-style-type: none"> - Up to 20 km Intertidal Zone - Has 90% of all Kutch salt pans - Seasonal Prawn Fishing - Wild Ass Sanctuary - Little or no farming - Little or no Animal Husbandry
	<p><u>Zone 2: Anjar, Mundra</u></p> <ul style="list-style-type: none"> - Up to 5 km Intertidal Zone - Full time Fishing - Small extent of Salt pans - Presence of Mangroves - Multi-crop Farming - Significant Animal Husbandry
	<p><u>Zone 3: Mandvi, Abdasa upto Jakhau</u></p> <ul style="list-style-type: none"> - Up to 100 m Intertidal Zone - Sandy Beaches - Part-time Pagadiya Fishing - 3 ATMs (Any Time Machimari)-fishing settlements - Multi-crop Farming - Significant Animal Husbandry
	<p><u>Zone 4: Abdasa from Jakhau, Lakhpat</u></p> <ul style="list-style-type: none"> - Up to 10 km intertidal Zone - Large tracts of Mangroves - Part-time Pagadiya Fishing - Single-crop Farming - Significant Animal Husbandry

To summarize,



The four zones are explained in greater detail in the following sections:

Chapter 2: Zone 1: Bhachau, Gandhidham

Chapter 3: Zone 2: Anjar, Mundra

Chapter 4: Zone 3: Mandvi and South Abdasa

Chapter 5: Zone 4: North Abdasa to Lakhpatt

Chapter 6: Exclusive chapter on the Mundra Issue

Chapter 7: Workshop Recommendations.

References:

1. Indiatat.com
2. 2001 census
3. ICMAM Report, 2002

Chapter 2: Bachau-Gandhidham Zone The 5 km zone from the sea comprises of fishing settlements, saltpans, scrub forest, agriculture land, wind farms and industries. The rough land use pattern of the Bachau-Gandhidham coastal zone is shown below



● - Fishing Settlements



Fishing settlements are located right next to

Traditional Fishing Zone

During the monsoons, freshwater collected in the catchment areas in North Gujarat, flows through the little Rann and enters the Gulf through the creeks in the Bachau region. Prawns are found in abundance in these creeks due to merging of fresh water with sea water. The fisherfolk fix their nets in the creeks and harvest the prawns regularly. This type of fishing is carried on for 3 months - July to September. For the remaining part of the year, the fisherfolk use their


<p>the coastline.</p> <p>There are 616 households¹ involved in fishing. The annual fish production is 5,251 MT² which fetches value of income of nearly 24.3 Cr.</p>	<p>boats to fish in the Gulf region like the Mundra Fisherfolk.</p> <p>The biggest threat to fishing in this zone comes from the salt pans (See case study for more details).</p>
 <p>Salt pans are located on the intertidal area which extends upto nearly 0.5 km in the land.</p>  <p>Smoke emanating from a industry, located 5 km away from salt pans. The plume is directed towards the coast.</p>	<p>Salt Pan Zone</p> <p>There are two methods of salt making in the area – Inland(salt extracted from ground water) and Marine(salt extracted from sea/creek water). Salt is made by solar evaporation in a series of nearly 6-8 salt pans, where the brine with increasing concentration is retained for a fixed duration before moving on to the next pan. In the final pan, salt is crystallised and collected manually.</p> <p>The salt industry is comprised of traditional “Dus Acreias” (owning saltpans of 10 acres or so), private salt traders owning upto 100 acres of saltpans, salt companies/cooperatives. Irrespective of land ownership, the labour in the salt pans are usually from the backward Koli community. Nearly 60,000 labourers are engaged in salt making in Bachau-gandhidham area³. As per estimates, the annual salt production in Bachau/Gandhidham area is 196 lakh MT valued at nearly 979 Cr.</p> <p>The main issue for the salt pans is the pollution from the coal based industries located 5-15 kms away from the salt pans. Because of the pollution, a layer of black soot is formed on the salt and roughly 5% of salt is lost due to pollution. The quality of salt also gets affected due to the pollution.</p>

¹ As per CMFRI survey of 2004

² As per fisheries department statistics

³ Derived from Salt commissionerate data

	<p>Scrub Forest Zone</p> <p>Beyond the salt pans, there are 3- 4 km of highly saline forest land covered with prosopis. There is significant forest area in the zone. Apart from stopping salinity and supporting a variety of wildlife, the scrub forest is useful for Animal husbandry in the coastal villages of Bachau-Gandhidham area. Nilgai are commonly found in these forests.</p>
 <p>Agriculture land extends from about 4 km from the coastline till the northern tip of the village. Horticulture is practiced further North.</p>	<p>Agriculture Zone</p> <p>The major crops grown are Bajra, Jowar, cotton, guwar, castor etc. Mostly, Dryland single-crop farming is practiced in the area. However, there are also some irrigated multi-crop farms where irrigation comes from surface water.</p> <p>The major issue is salinity ingress affecting the quality of soil and hence productivity. Another issue is the decrease in land used for agriculture. Increasingly, land is being used for industries and windfarms.</p>
 <p>Windfarms on Bachau-Gandhidham zone</p>	<p>Windfarms Zone</p> <p>There are an estimated 500 Windmills in the area. For each windmill, 2.5 acre of land is acquired. Because of the low productivity of land, farmers are enthusiastic to lease off their lands to the windmill companies. Each acre of land is fetches anywhere between Rs.20,000 to Rs.,50,000 for a 10 year lease. Each windmill produces 1500 KW or 1.5 MW of electricity and it seems to be for captive industrial purposes.</p>

	<p>Industries Zone</p> <p>(Left) Industries are located right next to the highway. The highway seems to be the main attraction for industries to setup shop. Also, the Narmada water pipe line runs close to the Highway, thereby enabling easy access to water for the industries.</p> <p>The snapshot of the industries in the area is provided in the table below</p>
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Severely Polluting	Pollution Severity	Type of Industry	Investment (Cr)	Number of Industries	Employment Generated	Particulars
		Thermal Power plants	6758	6	995	
		Non-polluting Infrastructure projects	70	6	97	Windmills, Warehouses etc
		MISC.MACHINERY AND ENGINEERING IND	2353	39	13408	Electrodes, pipes etc
		METALLURGICAL INDUSTRIES	1944	43	5910	
		FUELS	1743	14	3046	
		CERAMICS	914	10	8636	
		INDUSTRIAL INSTRUMENTS	842	6	1448	
		CHEMICALS(OTHER THAN FERT.)	475	33	3095	
		VEGETABLE OILS AND VANASPATHI	413	13	779	
		ELECTRICAL EQUIPMENTS	326	15	10344	
		CEMENT AND GYPSUM PRODUCTS	321	4	1205	
		TEXTILES(INC-DYED PRINTED OR PRO	310	17	1041	
		PLASTICS & PLAST.PRODUCT	232	18	9439	

	FERTILISERS	205	1	250	
	PETROCHEM.& REFINERY	179	5	348	
	FOOD PROCESSING INDUSTRIES	152	10	678	
	ELECTRONICS	149	17	8261	
	MISCELLANEOUS INDUSTRIES	129	16	5906	
	SOAPS,COSMETICS & TOILET PREPARA	106	7	227	
	OTHER INDUSTRIES	357	83	10251	
	Total	11,221	357	84,369	

Source of data : Kutch District Industrial Cell

Prawn fishing on the brink of extinction – a case study

Surajbari village is a small village located on top of a mound, right next to the Bachau coast. Officially, Surajbari is a part of the Shikarpur panchayat. Shikarpur is a big village about 6 kms away. But, in reality, Surajbari and Shikarpur are two separate villages and have separate panchayats. The Surajbari panchayat also governs the Cheravadi fishing bander. There is no political isolation of fisherfolk so common in Mundra Banders, as majority Surajbari is comprised of fishing families. There are some Kohlis who work as labourers in salt pans. There are no salt pan owners in the village.

There is no agriculture and animal husbandry is limited to very few sheep, goats and poultry. This is because the soil around the village (upto nearly 4 km from the coast) is saline and no agriculture is possible there. There are very small patches of grasses, prosopis that can provide fodder only for small number of animals.

The area around the village is comprised of salt pans and barren land, where only prosopis grows. Off late, salt industries have been mining sand from the village to construct bunds and roads. This is done without the panchayat permission and without any royalty paid to the village.



There is no traditional source of drinking water. The soil is saline, so any rainwater that collects in the ground turns salty. When the villagers saw the Narmada pipeline passing so close-by, they thought their drinking water problem was solved. However, this was not to be. The villagers went from pillar to post trying to a water connection for their village from the Narmada pipeline. But, in vain. They complain that connections are given easily to industries and big hotels, but for them getting a connection is very difficult. Therefore the villagers have now drawn a “Gair-Quaidesar” connection for themselves and the villagers have helped themselves to piped drinking water. It is said, self-help is the best help, and in India, sometimes, it is the only way out.

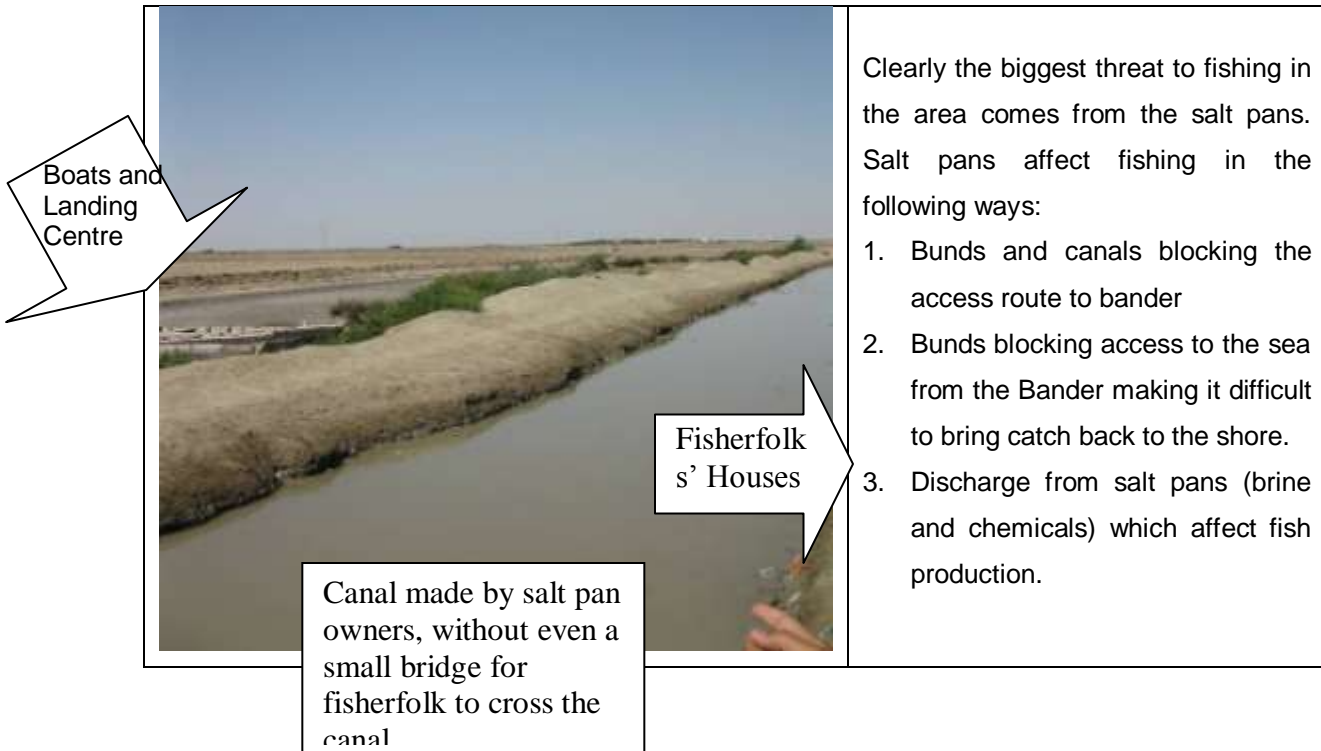
Habib bhai the sarpanch spoke fairly good Hindi and when complimented, he remarked that he learnt Hindi from the people who came to help after the earthquake.

Cheravadi is a Traditional Fishing settlement inhabited by Surajbari villagers. It is about 3 kms away from Surajbari. The main fishing season is June to September (during the monsoons), when prawns are caught by Pagadiyas. For the rest of the year, the fisherfolk venture out to the sea on boats and do Gunja fishing.

The surprising aspect of the Bander is that the houses are all pucca houses in stark contrast to the fisherfolk in Mundra’s banders who stay in shacks made of gunny bags and plastic material. The difference seems to be because the Bachau fisherfolk occupy the Bander throughout the year, sometimes the fishing continues for two years at a stretch, while the Mundra fisherfolk occupy the Bander for only 8-9 months in a year. However, the houses in Ceravadi do not have electricity or drinking water facilities.



Prawn catch has declined drastically in the last few years thereby rendering fisherfolk workless in the monsoon season. This has forced many of them to migrate to cities and make a living as construction workers. The decline in prawn catch is attributed to failure of monsoons and the unchecked expansion of salt pans in the area. Fisherfolk claim that freshwater from the creeks, which is required for prawn breeding is blocked by the saltpans, so that the salt pans are not affected by the freshwater. Also, the salt pans exploit the freshwater, turn it saline and extract salt from it.

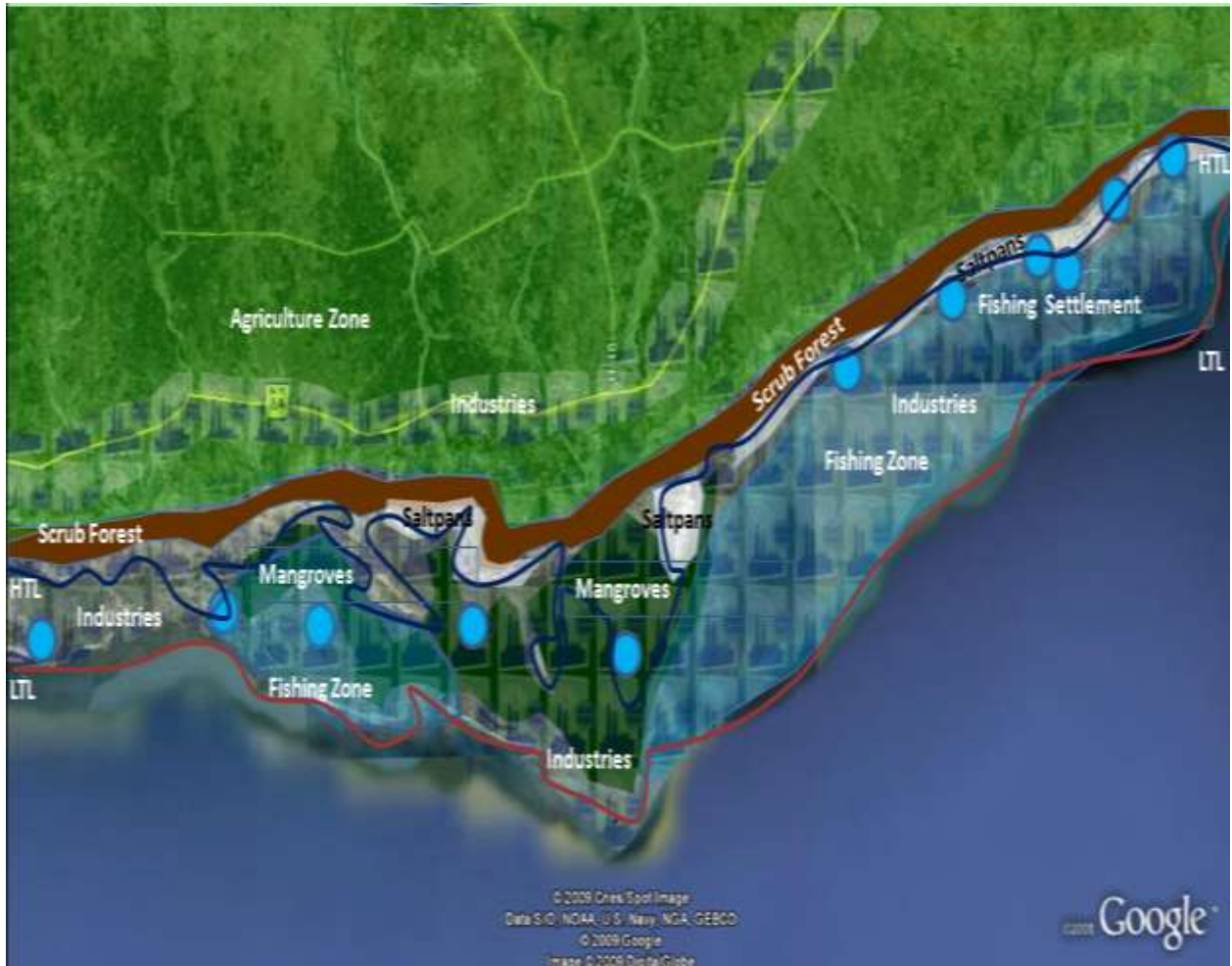


The fisherfolk are relatively less powerful vis-a-vis the salt pan owners and have very little or no influence/say over the changes that are taking place in the area. This is because the salt pans are owned by a few rich people (mostly from Gandhidham) and not local villagers. These are “salt companies”, and not traditional salt workers/owners who are locally called as “dus-acre-ias”.

The irony of the bander is that it is village with no electricity or drinking water, but it is right in the midst of all signs of modern development – railway lines, National Highway, Narmada Water Pipeline, Windfarms.



Chapter 3 Anjar-Mundra Zone The Anjar-Mundra coastal area (simply referred to as Mundra coast hereafter) comprises of nearly 5 km wide intertidal zone having mangrove forest, where traditionally fishing and salt have been practiced, now rapidly being used for industrialisation, 1-2 km of scrub forest, agriculture/horticulture area. The rough landuse classification of Mundra coast is shown below





Rich mangroves in Mundra coast provide conducive ecology for traditional livelihoods, esp. fishing



Randh Bander, a fishing settlement in Mundra coast is strategically located on a sandy ridge next to the mouth of a river in the intertidal zone,

Ecology of the Anjar-Mundra coastal zone

The 5 km long intertidal zone has several creeks. The area around the creeks has abundance of mangroves. The mangroves support fish breeding. The intertidal area provides specific strategic locations where traditional fishing can be carried out. See example of Randh Bander.

Ten years ago, scientists discovered patches of live corals off the Mundra coast. Because of the abundance of mangroves and associated biodiversity, scientists had recommended that the Mundra coast be demarcated as Marine national park and sanctuary.

The Mundra coast has nearly 2096 Ha of mangroves. Due to indiscriminate cutting and blocking of creeks by industries, the mangrove cover has reduced by about 300 Ha since 2000. The Mundra intertidal zone covers nearly 15,000 Ha, making it an attraction for industries that reclaim land by filling the intertidal area. See Chapter 6 on Mundra Issues for more details.



A view of the 200 year old bander (traditional fishing settlement).



Pagadiya fishing (fishing on foot) and boat fishing

Traditional Fishing

Fisherfolk migrate from the main villages to the banders (fishing settlements), where they stay for 8-9 months in a year and practice traditional fishing. There are two types of fishing – pagadiya (fishing on foot) and fishing by motorised boats. The main fish in the area is Bombay duck. As soon as the fish catch arrives at the bander, women sort the fish, wash it and put up for drying on bamboo poles. After the fish is dried, it is sold to local agents.

From here, the fish goes to markets in Mumbai, Assam and even exported to Srilanka, Bangladesh etc.

There are roughly 988 households⁴ engaged in traditional fishing on 12 Banders on the kutch coast. The total annual income generated from traditional fishing in the Mundra area is about 45 Cr.⁵

Two main issues for the fisherfolk are the immediate threat of physical displacement due to setting up of industries on/near their banders and the long-term threat of decline in fish catch due to deterioration of marine ecology caused by industrial pollution and environmental destruction, such as mangrove cutting. (See Chapter 6 on Mundra Issues for more details)

⁴ As per 2004 CMFRI survey

⁵ Calculated using fisheries department data

is carried out in the intertidal zone.



Bander Activity : Women sorting Bambay Duck before putting it up for drying on bamboo poles



Mundra Cattle depend on Gauchar land for fodder



Camel rearing has been badly affected due to

Animal Husbandry

There is significant animal husbandry in Mundra-Anjar area. The fodder for the cattle comes mainly from Grazing (Gauchar) lands in the village and agriculture waste. Additional fodder is purchased from the market.

With average 2000 cattle in a Mundra village, as per Gujarat Government norms, nearly 2500 Ha of Grazing land are to be maintained by the Mundra coastal villages in order to sustain animal husbandry in the villages. The shortage in gauchar land which was a manageable 10% of required Gauchar land 10 years ago, has now reached alarming proportions of 44%⁶ as gauchar land has been allotted to industries in the area. Also, the destruction of mangroves has led to drastic decline in camel population in the Mundra area. Locals claim that the camel population has reduced from 10,000 10 years ago to about

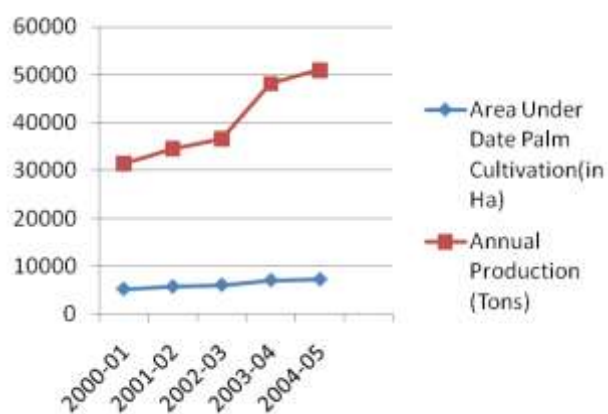
⁶ Calculated using data from panchayat records

clearing of mangroves.	500 currently.
 <p>Aerial image of a Mundra Salt pan</p>  <p>Salt pan workers and fisherfolk rally against industrial pollution in Mundra</p>	<p>Salt Making</p> <p>In the Mundra-Anjar zone, marine salt is produced. The salt is produced by the process of solar evaporation in salt pans as illustrated in the picture on the left.</p> <p>The salt pans in this zone produce roughly one tenth of the total salt produced in Kutch. The area under salt pans is about 1720 Ha, nearly 15,000 persons are involved in salt making and the annual production is around 6 lakh MT valued at around 30 Cr.⁷</p> <p>The main issue for the salt pans is the allocation of land previously used for salt pans to industries. Also the industrial pollution has started affecting salt production.</p>

⁷ Based on data provided by Bhadreshwar Salt association



Agriculture begins 2-3 km away from the coast



Production trend of Date Palm

Source: Date palm research centre, Mundra

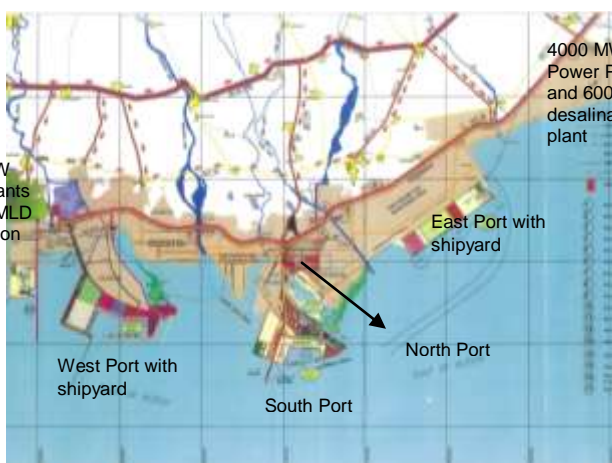
Agriculture/Horticulture

Mixed farming (Agriculture with horticulture and animal husbandry) is practiced in the area. Agriculture cropping practice in Mundra area is as follows:

Summer (Feb to May)	Bajra, Goundnut (with Irrigation)
Kharif (June to Sept)	Cotton, Castor, Groundnut, Jowar, Bajra, Luceran(fodder), Pulses, Guwar
Rabi (Oct to Jan)	Wheat, Mustard, Isabgol, Jowar (with Irrigation), pulses


Land prices in areas adjoining highways/ industries have increased nearly 100 times in last ten years. Interest in agriculture is on the wane, due to increasing land price, decreasing productivity and lack of Marketing Facilities.

West Mundra is part of the Mundra-Bhuj Horticulture Belt. Due to Salinity Ingress, plantation has changed from Chickoo to Date Palm in last few years. Date palm plantation and productivity is on the increase due to use of tissue culture/ Offshoot technology



Industries

The entire 60 km intertidal zone in Mundra area is being used up by industries. In addition to the existing Adani port, four new ports, backup facilities and shipyards are coming up in the Mundra coast. A multipurpose SEZ is being established along with the port. Nearly 25,000 MW power is to be generated by coal based power plants in the Mundra coast. Apart

 - The shaded portion is the proposed SEZ area.	from these, industries are coming up near the National highway which passes through Mundra. The details of the industries are shown below. See Chapter 6 for more details and issue related to the Adani Port and SEZ.
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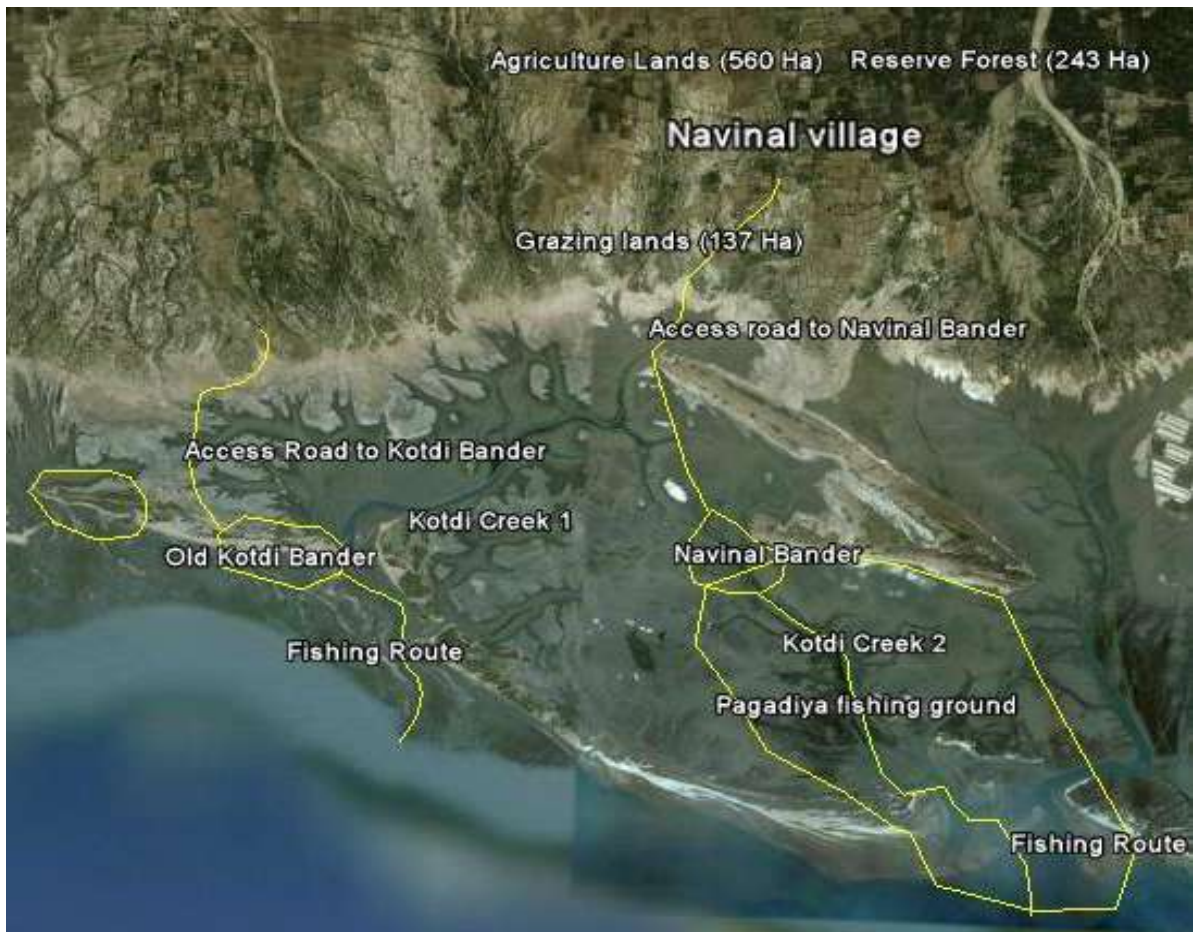
Pollution Severity	Type of Industry	Investment (Cr)	Number of Industries	Employment Generated	Particulars
	INFRASTRUCTURE PROJS.	131702	7	38875	Adani port, SEZ and 9900 MW power plant and Tata's 4000 MW Ultra Mega Power Plant and others.
	TRANSPORTATION	4321	2	1850	
	METALLURGICAL INDUSTRIES	3074	9	4266	
	CHEMICALS (OTHER THAN FERT.)	969	4	811	
	PETROCHEM.& REFINERY	791	3	500	
	MISC.MACH AND ENGINEERING IND	686	7	3040	
	VEGETABLE OILS AND VANASPATHI	171	2	378	
	PLASTICS & PLAST.PRODUCT	68	3	725	
	TEXTILES(INC-DYED PRINTED OR PRO	63	1	64	
	INDUSTRIAL INSTRUMENTS	31	1	70	
	MISCELLANEOUS INDUSTRIES	16	1	75	
	CEMENT AND GYPSUM PRODUCTS	15	2	246	
	FOOD PROCESSING INDUSTRIES	3	2	15	
	Total	141909	44	50915	

Source of data: Kutch District Industries Cell.

Navinal Village – displacement fear looming large – A case study

Nidhi, Pawan , PRM participants IRMA.

Navinal is a small village located on the coastal area of Mundra. The demography is a unique mix of Hindu Darbars and Muslim Waghers. While the Durbars form the dominant caste, the Muslim Waghers form the marginalized section of the residents. The Waghers with their low literacy and awareness have continued with their traditional occupation of fishing while the Durbars who were traditionally involved in agriculture have now moved on to other occupations or are even unemployed after they had to sell off their lands.



Google Map of Navinal village showing resources used for traditional livelihoods

It all started with the coming up of two mega thermal power plants with a total capacity of 15,000 MW in the adjoining area. While large tracts of land were procured for the construction of the power plants including agricultural and pasture lands, the real blow came when the Adanis started developing their West Port. This led to direct displacement of one of the weakest sections in the village – Waghers, who used to migrate to the coast for their only source of livelihood, fishing.

The village has a large livestock population and animal husbandry was an important livelihood option. With the sale of pasturelands, the livestock population faced a grave risk. The Sarpanch said that the land had been sold off by the higher authorities. The possession had not still been granted since people wanted a favorable deal for fodder. The Sarpanch gave us an example of the nearby village Tunda where the Tata Power had acquired land for the Power Plant and promised to provide the fodder for all the animals of the village. But in many cases the company has not kept its promise of providing the fodder in rainy seasons. When asked about such agreement in his village, he replied the conditions on which company acquired land was not clear.

b) Agricultural land

Navinal had witnessed sale of huge agricultural lands. Though apparently the government had not intervened but the people did confess that the company had used various tactics to force people to sell off their lands or face the fall of their land values. Loss of agricultural lands meant loss of livelihood for many farmers in the region. Though being promised of alternate jobs the real situation told a different story. Unemployment had increased in the village and not many had found jobs or any other source of livelihood. Moreover those who had resisted selling off their lands were now facing a sharp fall in land prices as now the general perception was that since a majority of land had been acquired the rest would be taken under the land acquisition act of the government.

c) Bandar land

One of the worst hit communities seems to have been the Waghers. Involved in fishing since the last several hundred years, this fishing community had been displaced after the construction of the west port of the Mundra Port and SEZ Ltd. Compensation though provided was meagre and the community now fears being permanently displaced from their current location on the coast. Lack of any alternative skill set means that this community would have no option but to perish.

2) Environmental and Economic Impacts:

The environmental impacts of the rapid industrialization have been severe. Large tracts of mangrove forests were cleared to provide land for the industries. People allege that while constructing the West port the promoters of MPSEZL had destroyed all the mangroves in the area. Cutting of these mangroves which serve as fish breeding grounds has severely affected the fish population in the region. Many fishermen of this village said that they were forced to sell their boats as the fish catch was not enough for sustenance.

During our visit to West Port we personally saw dredgers reclaiming land from sea and filling the creeks. The bottom of this creek serves the habitat for many small fishes which are the prey for

the carnivore fishes like Bombay Duck which is the main catch of the Kutch region. This directly results into fish catch reduction.

The promoters of MPSEZL have built one SPM in the region. These are used to transfer the oil from the point where the ships docks to the port. But during this operation there occurs oil spill in the sea and this is poisonous for the fishes. Also after the emptying of the vessel it is usually washed with water in the sea and the polluted water is released in the sea. There will also be various possible future implications of the Power plant on the village as it is very near to the plant site.

During our visits to the village we were told that there had been reduction in the traditional livelihood opportunities. Villagers were trying to cope up with the changed scenario by shifting to other occupations – like setting up small businesses and shops. Hawa Bai, a fisherwoman at Navinal told us that her son had set up a small restaurant near the power plant. People had taken up other small jobs like driving, masonry, security etc

3) Social and Cultural Impacts:

Although to a lesser extent but social and cultural impacts also seemed to be emerging in the village. Loss of livelihood and easy money by selling off lands had resulted in liquor addiction increasing in the village. Other cultural impacts had not been much as of now possibly because the village people had not allowed the migrant population to live within the boundaries of the village.

4) Infrastructure and Other Impacts:

The impact on the infrastructure has been a mixed one. The Panchayat road of the village has been ruined by the heavy loaded trucks which were using these roads while the construction of the plant. But simultaneously the new road has been constructed but it is on the other side of the village.

When asked about the various development activities carried out by the companies like providing healthcare facility at the village, people replied that it was only an attempt to gain sympathy from the people and it was serving no real use. The doctor came only once a week and the quality of service provided was very poor. Most people said that they preferred visiting the doctor in the nearby town.

Comments: Our study of the Navinal village gave us an impression of a bleak future for the residents. Those who had benefitted in terms of money obtained from selling lands had not found many avenues of using it constructively while largely many people had lost their livelihoods. People were trying to adopt survival strategies but did confess that they feared being permanently displaced from their village.

Chapter 4 Mandvi-Jakhau Zone The Mandvi-Jakhau coastal zone comprises of 3 fishing settlements at the extreme corners and a thin corridor which has a 100 m wide intertidal zone, beach front with windfarms, scrub forest, wasteland, and agricultural land. The rough landuse of the entire zone and the thin corridor is shown below





Fisherfolk live on the shore in shacks and navigate into the sea irrespective of the tide.



Government houses for fisherfolk unused as there is no electricity and got damaged during the 1998 cyclones



Fishing Settlements

Three main fishing settlements – Jakhau, Nanalayja and Salaya are located in this zone. Both pagadiya fishing and boat fishing are practiced here. Since the intertidal zone is very thin in this area, fisherfolk can venture into the sea at anytime and are not dependent on the tide. Fishes like Pomfrets, Tuna, Bombay duck etc are commonly found.

The fisherfolk in these settlements are engaged full time in fishing and have no other occupation. There are nearly 1340 fishing households in these settlements. The annual fish production is nearly 48,300 MT valued at nearly 222 Cr.

The main issues of fisherfolk are inadequate infrastructure facilities, threat of industrialisation.

(Left) A board announcing the plans to construct a port in the coastal area off Nana Layja village. Though land has been procured from the villagers, there has been no construction so far. The Nanalayja fisherfolk are worried that the proposed port will displace them from their traditional settlement.



Mandvi intertidal zone where pagadiya fishing takes place.

Pagadiya Fishing

The pagadiya fisherfolk of Mandvi coast (apart from the three settlements explained above) combine pagadiya fishing with agriculture and animal husbandry. Pagadiya fishing is carried out in the 100 – 150 m wide intertidal zone. The Mandvi fisherfolk venture for longer distances, sometimes upto 10 km away from their village,

The main issue of the pagadiya fisherfolk is the uncertainty in fish catch and the low returns from fishing, which only supports a hand-to-mouth existence.



The Mandvi coastal area is a thriving cotton cultivation zone, with cotton farms seen 1.5 – 2 km away from the coast.

Agriculture

Both Irrigated and dry land farming are practiced in the area. Usually, the source of water for irrigation is Ground water drawn through bore-wells. Ground water is saline upto 15 km from the coast and highly saline upto 4 km from the coast. Thus, we see that dry land farming is practiced near the coast and irrigated farming is practiced in the farms that are 5-6 km away from the coast. Cotton, Jowar, Bajra are the main crops grown here. Some villages, especially in the central corridor are endowed with good surface water facilities, and irrigated agriculture is possible in these villages.



Cultivable wastelands near the coast are used for grazing

Animal Husbandry

Animal husbandry is a main occupation in the area. Grazing land is available as cultivable wastelands and agriculture by-products. The thin forest cover acts as grazing land for the cattle. Fodder is also purchased from the market.



Windfarms dot the entire 100 km Mandvi – Jakhau coastline

Windfarms

Windfarms have been established on the entire Mandvi beach front. Apart from the beaches, windfarms are also being setup on private land near the coast. Villagers allege that the company officials used to grab lands from them by posing as Government officials and pay the villagers a pittance. After a while, the villagers realised that their land was being taken by a private company and started resisting the land grab. Though the company continued to purchase land, they had to negotiate a fair price with the owners.

Industries on Mandvi Coastal area

Industry	Investment (Cr)	No of industries	No of persons employed
WINDFARMS	7500	1	800
ALUMINIUM INDUSTRY	5876	2	1509
BENTONITE BASED INDUSTRY	13	1	40

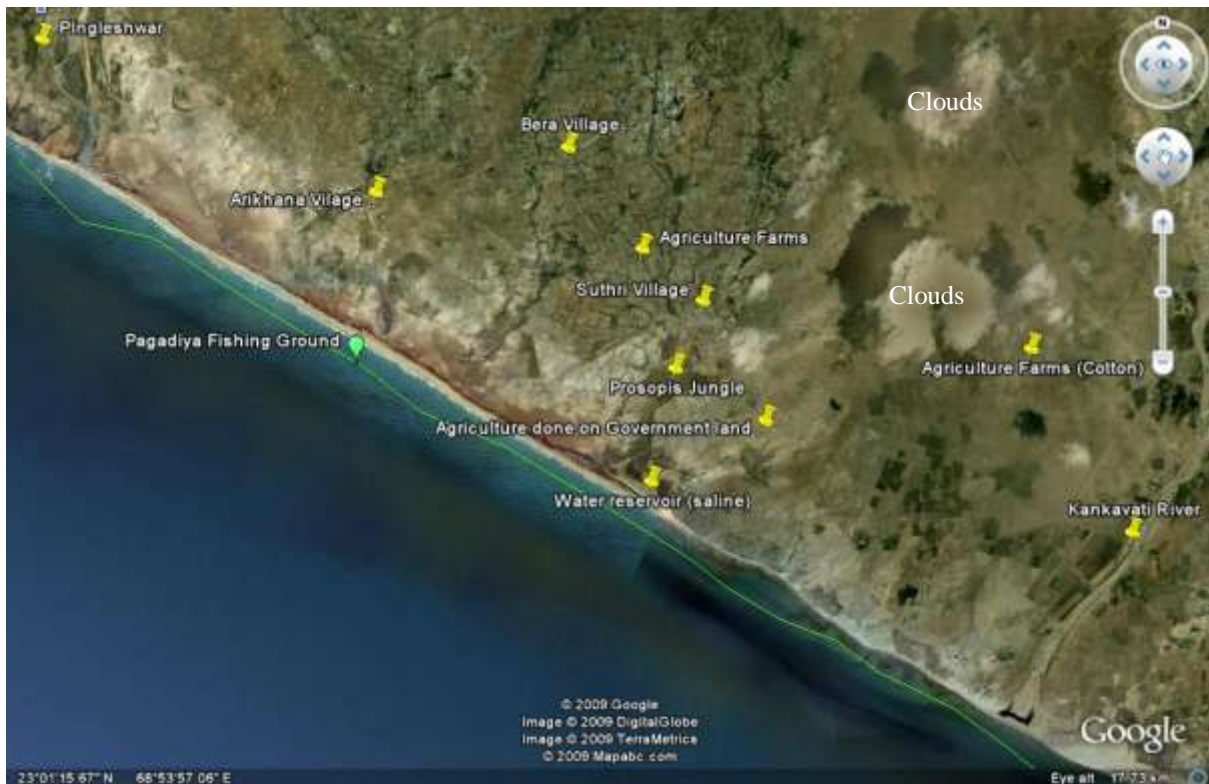
Industries

So far, Mandvi area has been untouched by industries, with the exception of Windfarms. It is surprising that there are no industries even along the highway in Mandvi coastal villages. Ironically, scientists have identified the Mandvi coast as the ideal zone for developing industries as the ecological and livelihood damage will

Total	13,389	4	2,349	be minimal. The reasons for this glaring contradiction are not clear – the Government in its website states that it is planning to develop Mandvi as a tourist hub – with hotels, resorts and other tourist attractions. But, the situation might change in the next few years as a lot of land has been acquired by agents and industrial giants like Ashapura group are having plans to establish big projects in the area.
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Pagadiya fishing on Mandvi coast: A hand-to mouth existence

Suthri village (Abdasa Taluka) is some 35 km East of Jakhau.



The village is comprised of Jains, Hindus and Muslims. Most of the Jains of the village have migrated to Mumbai and only some 20 families remain. Over 3/4th of the village is comprised of muslims, who are involved in agriculture and animal husbandry. Jowar, Bajra and cotton are the main crops here. Mostly rain-fed dryland farming is practiced

here as the ground water is saline and there are no other sources of freshwater for irrigation.

Hindu Kolis are involved in full-time pagadiya fishing. There are 50-60 full time pagadiya fisherfolk in the village. Women of the Koli community are involved in door to door retail sale of fish. Fish is sold locally at Rs.30-Rs.50 per kg. The bigger fish are sold in Jakhau market as it fetches a high price there.

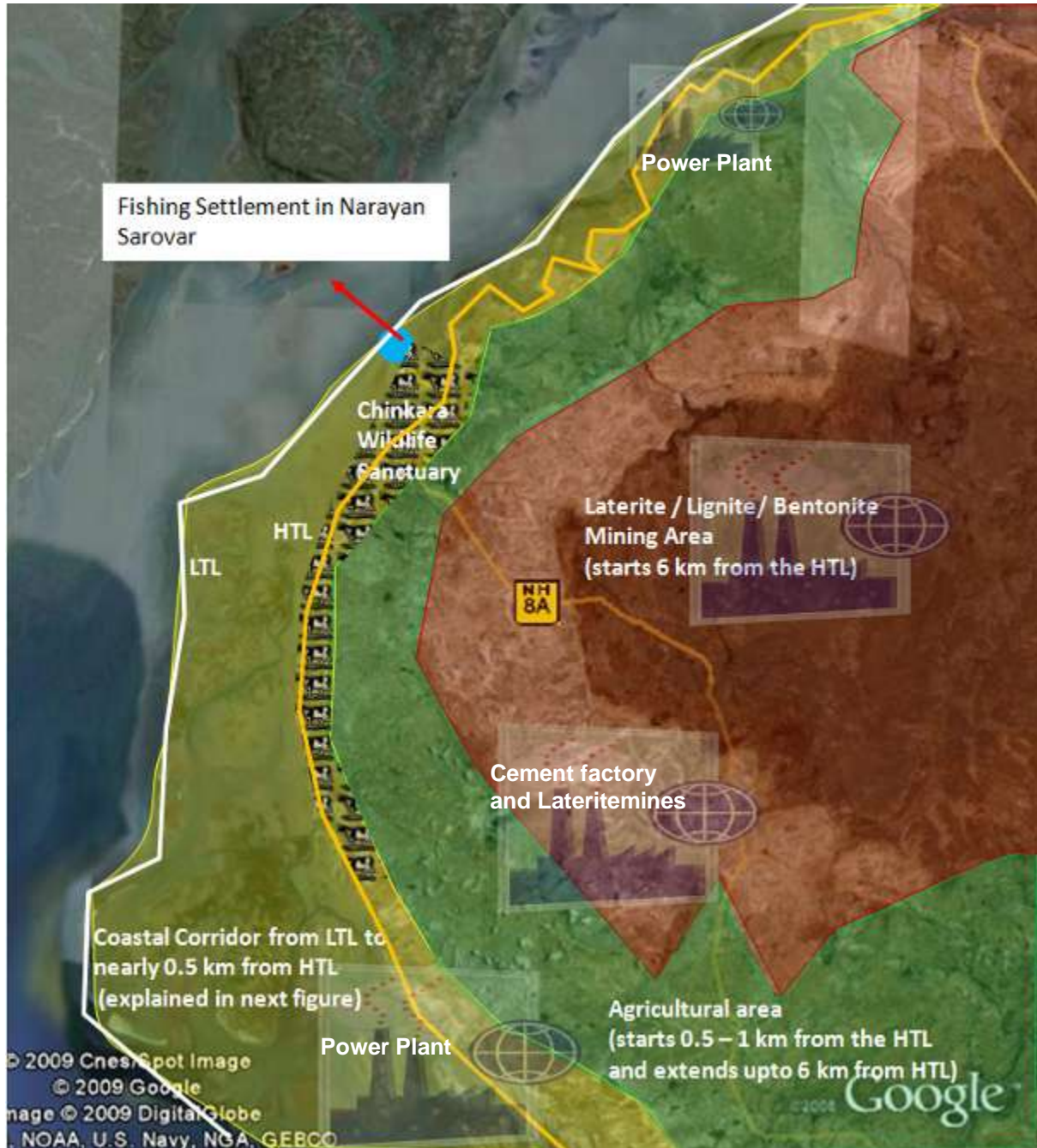
They use fixed nets and a type of net called “chakkar” net shown below. Harjibhai Ada Koli demonstrated the use of Chakkar net.

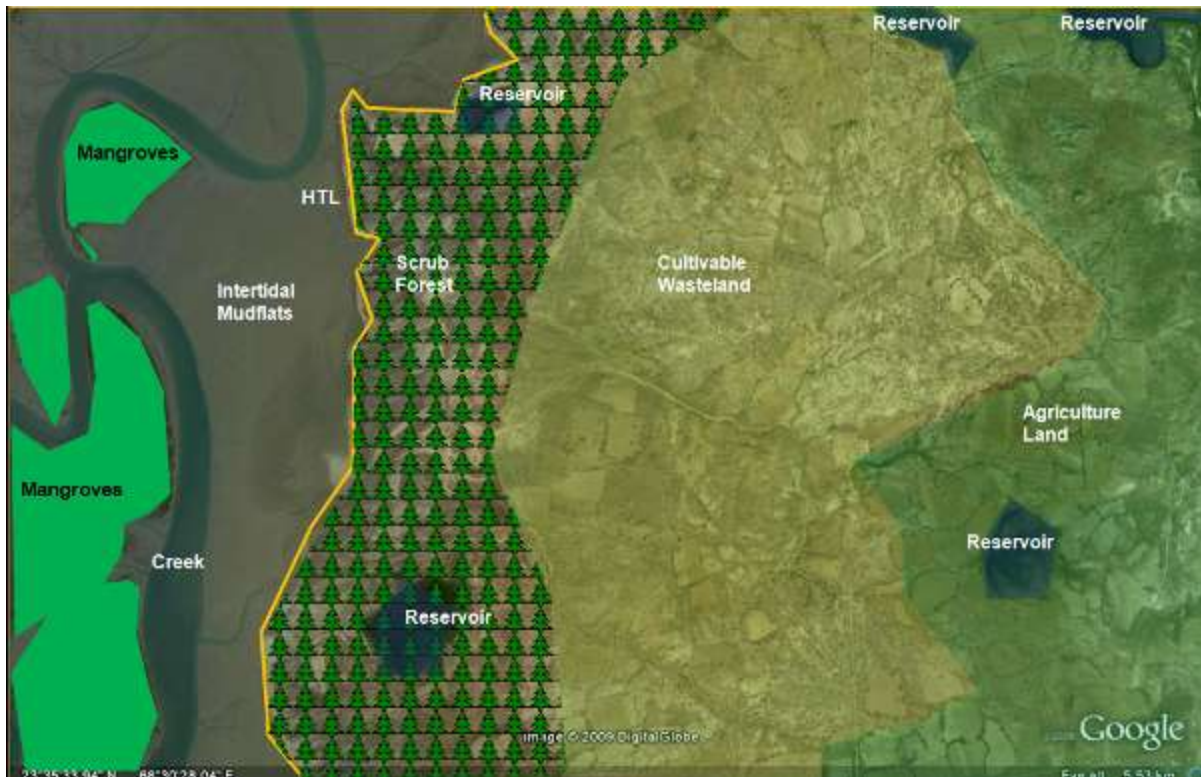


Apart from fishing, the Kolis also do part time agriculture on Government land. None of the Kolis in this village own private land. The Kolis used to make charcoal out of prosopis till it was banned some time ago. The people say that charcoal making was so lucrative that it generated enough money for each of them to build pucca houses within a year. But, the ban on cutting of prosopis imposed in 2003 ended the charcoal business.

Windfarms are located in the coast off Suthri village. Suthri is also part of the cotton belt that extends from Nana Layja to Jakhau. Animal husbandry is also a main occupation in the village. Gauchar land is spread all around the village. White Amber, a precious material used in perfumes and medicines is sometimes found on the coast. People say that the person who finds Amber has hit a lottery as it fetches upto Rs.1000/- per gram.

Chapter 5: Lakhpat-Abdasa coast The Lakhpat-Abdasa coast comprises of coastal corridor (explained in next figure), agriculture area, Mining area. Parts of the coast has been declared as a Chinkara Wildlife Sanctuary. There is one fishing settlement, namely Narayan Sarovar. The rough landuse of the Lakhpat-Abdasa coast is shown below:





Permits are issued only to inhabitants of Narayan Sarovar to use the Koteswar port for fishing.

Fishing Settlement

Narayan Sarovar(Koteswar port) is the only fishing settlement in the Lakhpat coast. Due to border security restrictions, the fishermen can enter the port only on particular days of the week permitted by the BSF. The main fishing grounds of the Narayan Sarovar Fisherfolk are the creeks near the Lakhpat coast.

A unique aspect of the Narayan Sarovar area w.r.t pagadiya fishing is that women are involved in full time pagadiya fishing. There are estimated 30-40 fulltime pagadiya fisherwomen. Men go for pagadiya fishing only during the boat fishing ban season.



Women are also issued pagadiya fishing permits.

The main issue of the Narayan Sarovar Fisherfolk is border restrictions due to which they are forced to remain in the sea for 3 days, leading to problems in fish quality.






The intertidal zone off Lakhpat village which was famous for prawn production some 15 years ago, now no longer productive due to receding of sea water. Nearly 334 households are involved in fishing (pagadiya and boat fishing) on the Lakhpat-coast. The annual fish production is estimated to be around 1949 MT valued at Rs.26 Cr.⁸


Pagadiya Fishing in villages (other than Narayan Sarovar)

In parts of the Lakhpat coast other than Narayan Sarovar, there is no boat fishing due to border restrictions. Pagadiya fishing is done as a part time occupation along with agriculture and animal husbandry.

Due to border restrictions, the pagadiya fisherfolk are allowed to enter the sea only during the day. However, the pagadiya fisherfolk don't face much of a problem as the nets remain fixed and they only need to collect the fish everyday. The main issues of the fisherfolk are the decline in fish catch due to effluents released by industries on the coast and receding of tidal water due to tapping of rivers upstream.

⁸ Calculated from Fisheries department data

 <p>Agriculture production affected in a 6 km radius due to pollution released by a nearby power plant.</p>	<p>Agriculture</p> <p>The soil in Lakhpat coast is fertile and there is no sign of salinity even near the coast. Dry land farming is mainly practices and Jowar, Bajra, Guwar and wheat are grown. Farming in the area is dependent on rainfall. However, since the soil is not saline and is rocky, a large amount of water can be retained on the surface by watershed structures. Thus, water for farming comes from several tanks and small dams in the area.</p> <p>The main issue of the farmers is the pollution released by industries, which affect productivity. (See case study for details)</p>
	<p>Animal Husbandry</p> <p>There is significant animal husbandry in the Lakhpat coast. Cultivable wastelands as near as 1.5 km from the coast, and the agriculture lands after harvest provide fodder for the animals. Fodder is also purchase from the market.</p>
	<p>Handicrafts</p> <p>The Lakhpat-Abdasa area is famous for Intricately embroidered material designed by women from the Jat community. Apart from embroidery, women also design exquisite bedding and pillows which are stuffed with material obtained from a locally available plant. The handicrafts are usually exchanged within the community itself and not for sale.</p>

	<p>Industries</p> <p>The main industries along the Lakhpat-Abdasa coast are mining, cement industries. In order to support these industries, there are power plants and desalination plants on the coast.</p> <p>The details of the industries are shown below</p>
<p>As per CRZ regulations, power plants are not allowed within 500m of the coast, but the Sanghi Power plant seen right on the coast.</p>	

	Type of Industry	Investment (Cr)	Number of Industries	Employment Generated
	CEMENT AND GYPSUM PRODUCTS	14762	15	14211
	THERMAL POWER PLANTS	5746	2	1600
	PLASTICS & PLAST.PRODUCT	565	1	1400
	CHEMICALS (OTHER THAN FERT.)	258	1	810
	MISC.MACH AND ENGINEERING IND	114	3	593
	INDUSTRIAL INSTRUMENTS	96	1	89
	FOOD PROCESSING INDUSTRIES	51	3	225
	FUELS	35	1	6
	DRUGS AND PHARMACEUTICALS	30	1	200
	TEXTILES(INC-DYED PRINTED OR PRO	15	1	135
	VEGETABLE OILS AND VANASPATI	10	1	150
	TIMBER PRODUCTS	7	1	96
	PETROCHEM.& REFINERY	2	1	16

	Total	21,689	32	19,531
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Case of Akri Moti Power plant and its impact on surrounding villages:

Nani Chher is a coastal village in the Northern most part of Lakhsat. The village comprises of Hindu Kohli, Muslim - Ker, Padiyar and Badala communities. All communities practice Agriculture mixed with Animal Husbandry as their main occupation and pagadiya fishing as an additional occupation. There are no salt pans in the area due to security restrictions. There are no boat fisherfolk.



We visited the farm of Isac Maulana. The farm is about 1.5 km from the coast. The soil is fertile and there is no sign of salinity. He practices dry land farming and grows Jowar, Bajra, Guwar and wheat. He also has a few cattle. Isac kaka's main occupation is agriculture mixed with animal husbandry. He goes for pagadiya fishing sometimes if he hears that there is a good catch. Nearly 10 km of intertidal zone in front of the village is used for pagadiya fishing.

The Akri Moti power plant was setup by GMDC (Gujarat Mining Development Corporation) in 2002. It is a 250 MW Coal based power plant with desalination plant and water intake from sea. It is about 2.5 km from Nani Chher.

Villagers complained that smog/mist mixed with the pollutants affects agriculture as far as 6 km away. Fish production also declined after the power plant started operations. Isac kaka's farm is about 1 km away from the power plant. Isac kaka says that his dress turns blackish if he works for long hours in his field.



The impact of pollutants on the field is clearly visible. The main pollutant is coal dust and fly ash. There are sprinklers in the power plant to prevent the dust from being blown by wind, but the sprinklers are rarely used and dust keeps flying out of the power plant and settles on the nearby fields. Productivity has been badly affected and has caused total crop loss in Issac Kaka's field. Fields in Shinapar, as far as 6 km away from the power plant, are experiencing the harmful impact of the power plant.



Fish catch has also declined considerably. Though the villagers attribute the decline in fish catch to the effluents released by the power plant, what could have compounded the problem for fishing is the large scale destruction of mangroves that took place during the 1998-99 cyclones.

The villagers have taken part in some protests earlier. The GMDC colony which was constructed a few years back blocked their access to their Lal Pir Dargah. The villagers went on a fast demanding their access to the dargah. After 4 days of fasting by the villagers, the GMDC officials relented and instructed the local officers to ensure access to the dargah for the local villagers.

Chapter 6 Impact of Industrial Expansion in Mundra Coast

Overview of Mundra Port/SEZ

The existing Adani port was established in 1998. The Mundra Port currently has multipurpose terminals, container terminals for ships of varying sizes and nature of cargo, facilities for oil tankers and port backup facilities such as open storage area, covered godowns, chemical and oil storage tank farm etc. Support infrastructure, comprises connectivity to national network of railways and roads, power supply, water supply and other utilities and services.



The proposed WFDP comprises four port clusters - namely West Port, South Port, North Port and East Port, a Liquefied Natural Gas terminal, two shipyards, three desalination plants, associated intake and outfall structures, port interconnecting road/link network and other necessary infrastructure. The landward side of the port is to be made into a multipurpose SEZ. Two mega power plants, the Tatas' UMPP(Ultra Mega Power Plant) of 4000 MW capacity and the Adani's 9900 MW power plant are under construction. The proposed structures are shown on the map below:



Usage and Capacity

The estimated ship traffic in these ports is listed below:

Port	No of ships per year by 2013	Nature of cargo
West	850	Coal, Steel Scrap, Chemicals, Dry Bulk
South	220	Dry Bulk and Oil
North	150	Automobiles
East	300	Steel Scrap, Dry Bulk

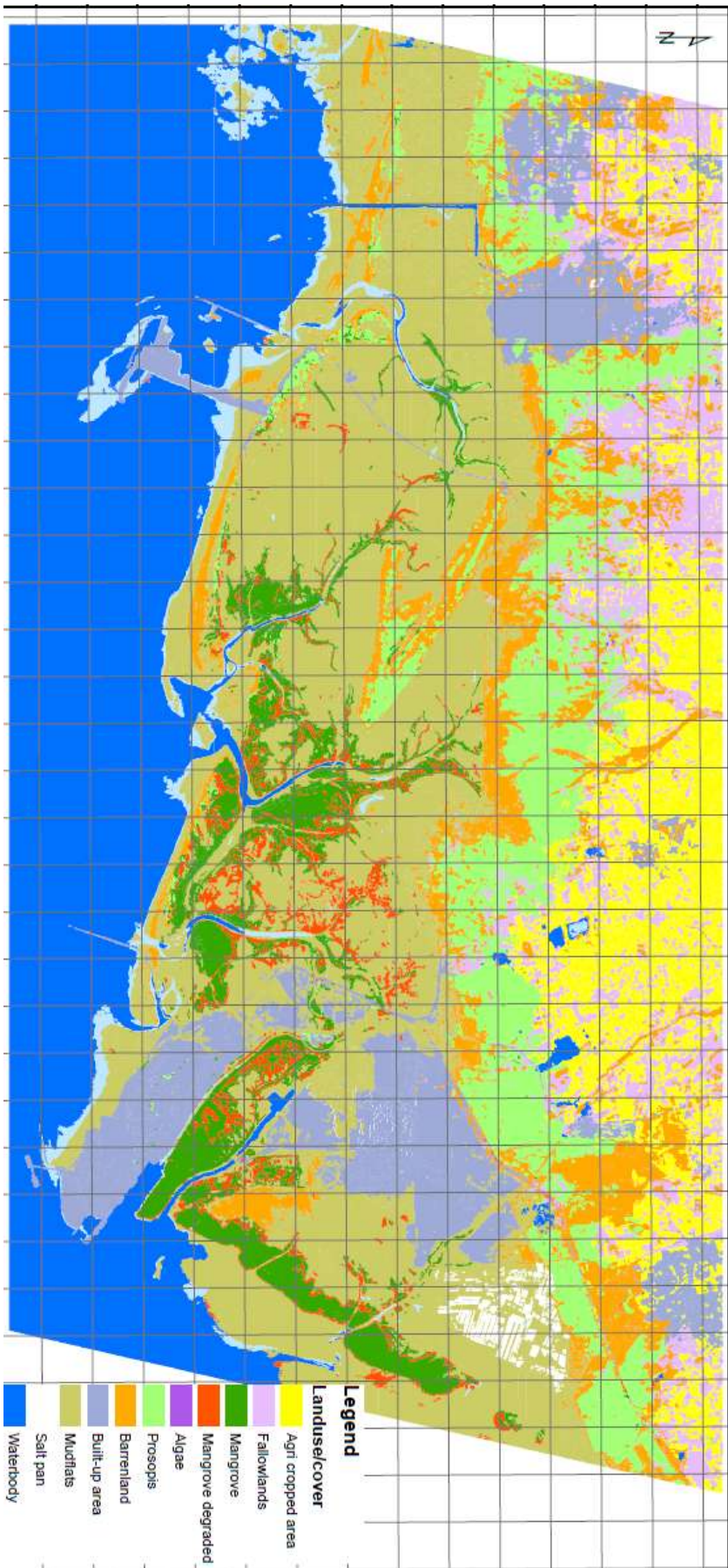
The capacity of the Desalination plant near West port is 300 million litres per day. Nearly 1.5 times the capacity is discharged into the sea as saline water. Desalination plants of 100 mld, 140 mld capacities are proposed in future. Also, the effluents from the two mega power plants will be discharged into the sea.

Ecological significance of the area

Gulf of Kutch is one of the few coastal zones in the world having rich bio-diversity. It comprises of mangroves, Coral reefs, Mudflats, Seaweeds, Commercial Fishes and several rare marine species. The mangroves of the gulf are the second largest after the Sunderbans in the mainland of India. Gulf of Kutch is the only place left along the Indian coast after Gulf of Mannar where live corals occur. In 1982, parts of the Gulf area were declared as a Sanctuary and Marine National Park. Recently, scientists have discovered patches of live corals near Mundra coast. Thus, the Mundra coast is an ecologically sensitive zone as it supports vast areas of Mangroves, Corals and associated ecosystems.

Destruction of any of the above components of the fragile ecology will disrupt the entire ecosystem. The mangroves help the ecosystem by contributing to the oxygen Budget and in Soil Conservation. Mangroves and Corals are the nursing grounds for a variety of economically important fishes, exotic coral fishes and innumerable flora and fauna. The gulf also abounds in more than 210 species of algae. These algae in combination with corals and mangroves provide a conducive ecosystem for diverse flora and fauna.

Analysis of the satellite imagery of the Mundra region reveals the following landuse pattern:



Status of Landuse/cover of Mundra Area(2008) :

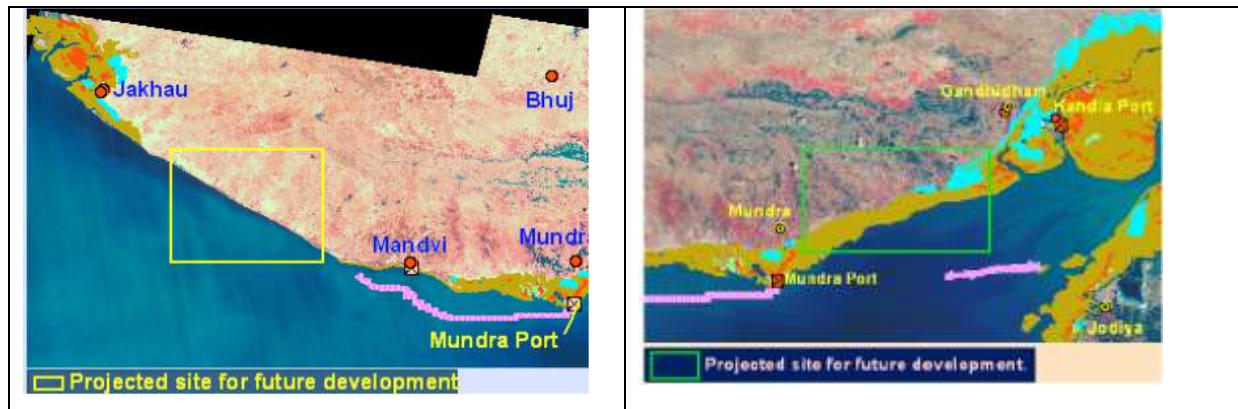
Sr.No.	Luse/cover	Area in Ha.	% to Total
1	Agri cropped area	2,588	8.06
2	Fallowlands	2,022	6.30
3	Mangrove	1,493	4.65
4	Mangrove degraded	604	1.88
5	Prosopis	2,697	8.40
6	Barrenland	2,586	8.05
7	Built-up area	2,634	8.20
8	Mudflats	8,395	26.14
9	Salt pan	137	0.43
10	Waterbody	8,373	26.07
11	Turbid Waterbody	587	1.83
	Total:	32,115	100.00

The significance of mangroves in coastal ecosystems is undebatable. The Government of India and the Ministry of Environment and Forests recognise that mangrove forests are ecologically sensitive areas and need to be protected and conserved. Mangroves are critical to marine coastal soil conservation, breeding and nursery grounds for fish, crustaceans and other sea life, as well as vital habitat for birds and other wildlife. As per estimation, just 100 cu m of mangrove area shelters 54,600 prawns. Kutch district has been declared the most important mangrove areas in the state of Gujarat.

A prominent feature of the Mundra Coast is the vast intertidal zone comprising a network of creeks, estuaries and mudflats. The intertidal zone is unique and very important because the fishermen can land their boats in these natural creeks and also keep them there safe from strong winds and currents. The fisherfolk have complete knowledge of the sea and have been living on the coasts for ages. They are familiar with the creeks of the area and the intertidal zone is important for their occupation, economic prosperity and survival of their families. The creeks also form a natural drainage system which if disturbed might lead to flooding during monsoons.

Scientists have identified vacant sites along the Kutch coast (Zone 3 Mandvi-Jakhau, Zone 1 Bachau Gandhidham) which could be used for industrial development. Along the northern coast, two lengthy stretches are available without any ecologically sensitive zones that could be used for

future development of industries. Why use the ecologically sensitive and traditional livelihood supporting Mundra Coast for Industrial Development when alternative sites are available nearby.



People using the Mundra area for traditional livelihood

Fishing Communities



The marine fishing settlements are transient fishing villages, which are inhabited by the fishing communities for 8-10 months in a year. The transient villages are on sand dunes or mudflats. After the fishing season the fishing communities return back to their formal villages, which are usually 40 to 50 kilometers away from these transient villages. Usually, all the fishing households from a village migrate to a particular coastal settlement and stay together.

The coastal settlements are mentioned below:

Sr.	Harbour	Village	Taluka	No of Families
1.	Randh	Bhadreshwar	Mundra	316
2.	Bavdi	Kukadsar	Mundra	40
3.	Juna	Shekhadia	Mundra	40
4.	Luni	Luni	Mundra	178
5.	Vira	Vira	Anjar	85
6.	Bharudiya	Bhadreshwar	Mundra	30
7.	Tragadi	Tragdi	Mandvi	35

8.	Shekhadia	Shekhadia	Mundra	75
9.	Zarapara	Zarapara	Mundra	101
10.	Navinal Kutadi	Navinal	Mundra	30
11.	Veera Pagadiya	Sangad and Vandi	Anjar	90

More than 1000 families of the Mundra coastal area are involved in fishing. These are fisherfolk who fish on small boats and on feet. Besides fishing in high seas, about 229 people are involved in direct fish sale; 73 people are involved in net making & repairing; whereas over 5000 women are involved in processing of fish.

Graziers and Livestock rearers

14 villages in the project area are dominated by Rabaris (a traditional cattle/buffalorearing community relying entirely on animal husbandry). Gujarat government order (2002) directs that every village has to have 40 acres of gauchar land for 100 animals. The total livestock in the 14 villages and the population dependent on it is shown below

Village	Cattle	Reqd Gauchar Land(Ha)	Total Gauchar Land (Ha)	Gauchar Land allotted to SEZ(Ha)	Gauchar land Remaining(Ha)	Shortage in Required Gauchar Land %
Navinal	1753	280	137	94	43	85%
Tunda	1189	190.24	158	86	72	62%
Luni	833	133.28	81	81	0	100%
Siracha	3170	507.2	390	41	349	31%
Baroi	276	44.16	141	31	110	
Goersama	957	153.12	86	29	57	63%
Zarapara	5509	881.44	1000	408	592	33%
Mundra	273	43.68	NA	496	NA	

Source: Panchayat Records

Old Port related occupations

There are several old Ports in Gujarat at Porbandar, Mandvi and Jamnagar. But the Old Mundra Port (adjacent to the Adani Port) and run by the Gujarat Maritime Board is the only one that is doing good business. The trade from Mundra Port includes export of food grains to Somalia, Iraq and other middle Eastern countries. These ports are small and do not require dredging since there are no ships used. They use country crafts of capacities varying from 500 to 1500 tonnes which are built locally in Mandvi. The Maritime board has an income of almost Rs 1 crore from the Old Mundra Port alone.

Project Impacts

Till date

Displacement of fisherfolk

Nearly 35 fisherfolk of Kuthadi Bander near Navinal village who were fishing using the Baradi Mata and Kotadi Creeks have already been displaced when work started for the construction of intake and outfall channels for the Power plant and Desalination plant and dredging for the West port.

Other Livelihoods Affected

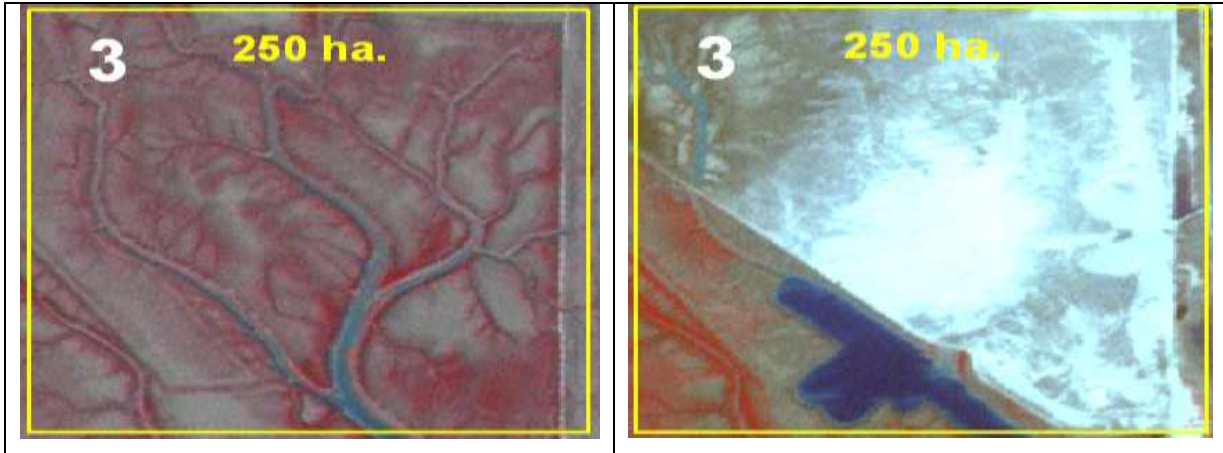
The fishing communities are only one segment of the affected population. The agriculturists, the horticulturists (date orchards) and those dependent on animal husbandry have been badly hit as grazing grounds are shrinking. A total of 14 villages have already lost more than 1,400 acres of grazing land (under panchayats) to the SEZ. Maldharis (livestock rearers) came out strongly against the company in the November 11 public hearing. Says Vaaljibhai from Jharpara village, where 60% of the families depend completely on livestock rearing, "We have been protesting against the handover of 1,000 acres of our *gowcher* land for the SEZ. We will not let the company set foot on our grazing lands." On December 22, the village organised a rally in front of the Mundra tehsil office and warned that they will bring their 8,000-odd cattle and buffaloes into Mundra town and block all the roads if the notices to their panchayats (about the handover of *gowcher* lands) are not withdrawn.

Large scale Destruction of Mangroves

"Mundra was the region which housed more than 20% of mangroves of the Gulf of Kutch up until eight years ago when the Adani group of industries made a small start by developing a private jetty in the area. The process of deforestation and clearing started in 1998 by the company. Direct felling, bunding and staving off sea water (leading to drying up of the mangroves), excavation and filling the area with sand dredged from the creeks and channels close by were the methods used," says Ashwin Zinzuwadia, a journalist and avid nature lover based in Mundra.

	<p>Dense Mangroves being uprooted by excavators in 2007 for the construction of the Adani Port / SEZ.</p>
	<p>Creeks blocked by constructing bunds in order to starve the mangroves.</p>
	<p>After destroying mangroves., dredged soil is dumped in the area so that the area looks like a wasteland which can be easily claimed from the Government.</p>

A Gujarat Forest Department report by H S Singh, Chief Conservator of Forests, published in early-2007 talks about "drastic losses of mangrove forest stem" mainly from industrial activities, specifically in the Gulf of Kutch. "In certain areas like Mundra and Hazira, they disappeared overnight," states Dr Singh. Quoted in this report, the Mundra SEZ area had 3,000 hectares of mangroves and much of these had already been cleared.



Comparison of satellite imageries of a part of Mundra near the Adani port in 2000 and in 2008 reveals large scale destruction of mangroves.

Blocking of Creeks

When revenue land in the area was purchased by the company, all the letters issued by the Collector had some conditions which included allowing the natural drainage patterns to remain unaffected, the traditional paths and roads not to be blocked etc. Bunds 15-20-km long have been constructed for filling the land which have totally blocked the natural drainage systems as a result of which Mundra town was virtually flooded in the last monsoon with rivers draining into the Gulf of Kutch being completely blocked.

Water Crisis

The other major issue is the water crisis which is affecting irrigation and drinking water needs. The company is not only extracting groundwater but is also getting water from the Narmada Canal. In Kutch, 47.5 million litres per day of water from the Narmada has already been allotted to various industries including the Adani group.

The company has been speaking of desalination plants since its first Environment Impact Assessment and not one has been constructed. Instead it has opted for cheaper options to externalise the costs considering that it has to pay almost Rs 10/ 1,000 litres for the Narmada water. In addition to that, the company and its subcontractors are taking large quantities of water from tanker suppliers for construction and other domestic use. All this has already started

showing significant negative impact on the area's groundwater and increase in salinity. Not that the desalination plants of large capacities would not be harmful. "The salt extracted would be dumped into the nearby seas and creeks making it impossible for marine fauna to survive," adds Michael Mazgaonkar of Paryavaran Suraksha Samiti, an environment action group in Gujarat.

Likely future impacts on environment

The WFDP is likely to create serious hazard for the local environment. The Mundra coast has nearly 2000 Ha of Mangroves. The dense mangrove vegetation, which forms a crucial link for marine ecology is being destroyed for the expansion of the Adani port. Mangroves are also crucial for their shore-line stabilizing role, serving as a natural wall against ocean currents and cyclones. As this protection would be removed, the hinter land would be more vulnerable to natural disasters

The salinity of water is likely to increase once the desalination plant is operational. The increase in salinity would hamper the breeding of prawns leading to loss in income for the traditional fisher-folk. In Jakhao, the desalination plant setup by Sanghi has been operational since 1998. Before the plant was started Prawn fishing was widely prevalent in the area. But, the prawn catch declined after the desalination plant was started and now is virtually non-existent.

Fish merchants are reluctant to buy fish near Kandla port due to the smell of oil that is noticed in the fish in the area. Now, with the rapid expansion of the Mundra port, is the same situation likely to occur throughout the Gulf of Kutch.

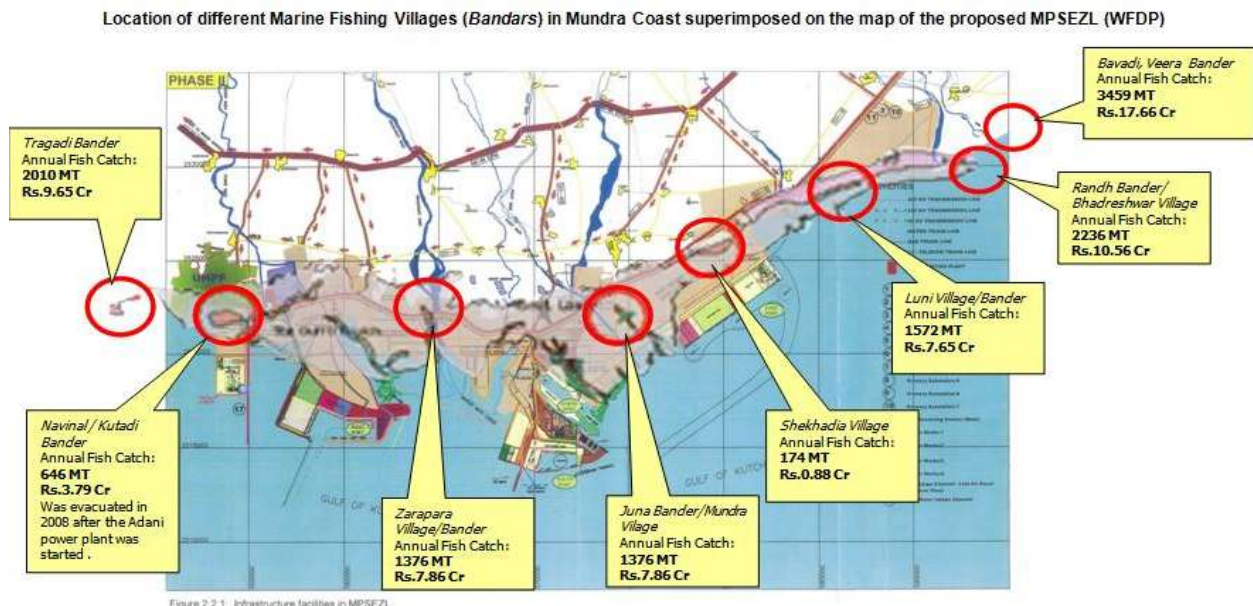
All the impact assessment studies, which are mandatory for clearances under the CRZ notification, were initially done for the Adani's Mundra projects by the National Institute of Oceanography. The concluding statements in all the reports that are quoted in the state government's recommendations are more or less the same. They all speak of the biodiversity and marine ecology of the area being critical. They all refer to the localised impacts of the developments, whether port expansion or bulk terminal construction, on the benthic flora and fauna of the region. But all of them end with the statement that the "overall impact would be insignificant".

A glance at the EIA clearly reveals that there has been little groundwork done by the consultants. The EIA unjustifiably portrays the project area as barren land the development of which would therefore lack significant environmental impacts. The image from Google maps apparently reveals a vast area of natural marine ecology that would be dredged or filled under the project proposal. It is highly misleading to characterise this land as wasteland. The shallow waters and

tidal mud flats that comprise this vast undisturbed area play a vital role in the overall ecology of the area even if they are not heavily vegetated," claims Mark Chernaik, a technical expert of the E-Law Network, who carried out a critical analysis of the EIA report.

Likely impact on livelihoods

More than 1,000 fishing families of the area have been suffering as a result of the Adani group's activities in the region. These are fisherfolk who fish on small boats and on foot. "Besides fishing in high seas, about 229 people are involved in direct vending; 73 people are involved in net making and repairing; whereas about 1,037 people are involved in processing of fish. It is almost a Rs 100 crore economy," states a report prepared by SETU and Yusuf Meherally Centre. The port and SEZ-related construction have been blocking their traditional fishing routes apart from completely destroying their traditional fishing creeks and harbours.



Annual Fish Production in the area affected by the MPSEZL/WFDP

12027 MT, Rs.60.8 Cr

Source of data (Annual Fish Catch in MT): Fisheries Department Bhuj.

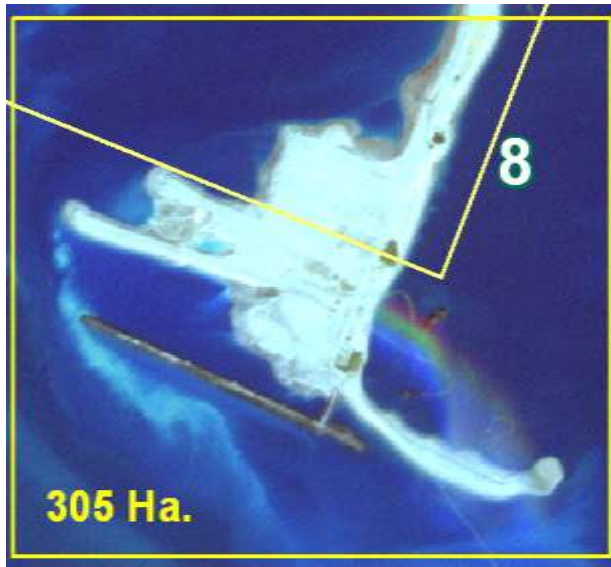
Note:

1. Average annual fish catch for the period 2000-05 has been mentioned.
2. Total Fish catch includes Fish catch by mechanized boat and Pagadia fishing.
3. Value of Fish catch has been calculated on basis of current Market Prices.

Affected people

- Nearly 10000 fisherfolk
- 1015 Muslim Wagher families
- 452 Motorized boats used by fisherfolk to venture short distances of about 10 km in to the sea.
- Nearly 1000 Pagadiya families who go by walk into the intertidal zone for fishing.
- Also Grazers and Farmers in nearby villages

Real and hard-hitting questions were raised by the local people on the day of the hearing in Nov, 2008. While they were shocked that the EIA says that the proposed project area has no habitation and does not involve any kind of rehabilitation or resettlement issues, what really surprised them is that the government, after a decade of the company's expansion, asked for a



public hearing to take place. "What is the point of this now, after everything is almost over? They have destroyed the place and are now asking our opinion," said many of the fishermen from the affected villages. A visit to the proposed area for the West Port of the Water Front Plan in 2008 revealed that construction work had been full swing for over 6 months – a complete violation of the Environment Impact Assessment Notification (2006) which disallows any activity till the Environment Clearance is granted by the Union Ministry. **(above)** Construction of West Port prior to Environmental clearance seen in

Satellite image of December 2008. Environmental clearance was granted in January 2009 and Final Forest clearance is still pending.

In February 2009, the fisherfolk approached the NEAA (National Environment Appellate Authority) and appealed that clearance be rejected for the Adani Port expansion project (Water front development project). In its verdict the NEAA declined to reject the clearance, but acknowledging the fisherfolk issues as genuine, the NEAA directed the state government to ensure unhindered fishing in the Mundra area. Regarding the environmental violations the fisherfolk were given the liberty to approach the statutory bodies, namely the MoEF authorities.

In a presentation before the Hon. Minister for Environment and Forests during the CMZ consultations in Mumbai on August 12th, Mr. Bharat Patel, the general secretary of MASS (Machimar Adhikar Sangharsh Sangathan) highlighted the issues of the fisherfolk, the mangrove destruction and the violation of environmental laws by the Adanis. Shocked at the 2007 photographs of mangroves being indiscriminately cleared by use of excavators, Shri. Jairam Ramesh has assured in public that a committee would soon be sent to investigate the Mundra Issue.

Demands of Fisherfolk

1. The Bander land should be allotted to fisherfolk and the bander should be declared as a fishing zone.
2. 5-7 km wide and 4 km long stretch of Intertidal zone in front of each Bander should be meant for fishing only and not used for any industrial development.
3. The access road from main road to the Bander should not be blocked
4. Creeks in the Mundra Coast should not be filled or blocked as they are used by fisherfolk to navigate to fishing grounds.
5. The sea routes to the fishing grounds should not be obstructed by ships anchored on the routes to the port
6. Hazardous wastes and oil should not be dumped near the coast. Highly Saline discharge from desalination plants can be treated and used for salt extraction, but should not be disposed in the sea near the shore as it will affect fishing. No Desalination plant or shipyard should be allowed near the fishing enclaves
7. Destruction of Mangroves near the Mundra Coast should be stopped as mangroves are crucial for fishing livelihood.

In short, Further expansion of the Adani Port - Waterfront Development project should be stopped.

References

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