THE REAL COST OF POWER

Report of The Independent Fact-Finding Team on
The Social, Environmental, and Economic Impacts of
Tata Mundra Ultra Mega Power Project, Kutch, Gujarat

June 2012

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Abbreviations

ADB – Asian Development Bank

CGPL – Coastal Gujarat Power Limited

EIA – Environmental Impact Assessment

IFC – International Finance Corporation

IFI – International Financial Institution

MASS – Machimar Adhikaar Sangharsh Sangathan

MW – Megawatt

SIA – Social Impact Assessment

T&D – Transmission and Distribution

UMPP – Ultra Mega Power Project

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Acknowledgment

The fact-finding was assisted with information and data collection by many individuals and organizations. The team acknowledges their contribution.

We thank the local organization, Machimar Adhikaar Sangharsh Sangathan, its members and local communities for sharing their views, explaining their concerns, and assisting us in the field visits.

We thank the CEO of CGPL Mr. KK Sharma, and his senior staff for meeting us, responding to our concerns and explaining their point of view.

We thank individuals and organizations who facilitated the logistical arrangements.

Section I - The Fact-Finding Mission

Why this Fact-Finding Mission?

The 4,000 MW Tata Mundra (Coastal Gujarat Power Limited) Project is the first Ultra Mega Power Project (UMPP) to get approval from the Government of India in 2006-07 while promoting UMPPs as a solution to the growing energy demands of the country. However, having the project coming up in the ecologically fragile areas of Kutch, within the vicinity of the mega Mundra SEZ and this being one among the many projects in a stretch of 70 kms, targeted to produce 22,000 MW power, the project has been marred with serious social and environmental impacts.

The affected communities, organized under Machimar Adhikar Sangharsh Sangathan (MASS – Association for the Struggle for Fishworkers' Rights), have been raising these issues in various forums. MASS is a constituent of the National Fishworkers Forum (NFF), a national federation of state-level trade unions of traditional fishworkers. MASS submitted to NFF a request to constitute an independent fact-finding team of eminence to look into the violations and report. NFF requested its national secretariat, Delhi Forum, to assist them in the process.

Fact-finding team members listening to fisher-folk near a *Bunder*.

The fact-finding team was finally constituted in the month of April 2012. The team was headed by Justice (retired) S N Bhargava, former Chief Justice of Sikkim High Court, as well as former Chairperson of Human Rights Commissions of Assam and Manipur. The other members are Dr. Varadarajan Sampath, a marine scientist; Praful Bidwai, senior journalist and columnist; Jarjum Ete, former Chairpersion of the Commission for Women, Arunachal Pradesh; and Soumya Dutta, energy specialist and national convenor of Bharat Jan Vigyan Jatha. The Terms of Reference of the team are annexed (Annex II).

The two visits of the fact-finding team

The fact-finding team made two visits to the project affected areas on April 24-25 and May 19-21, 2012.
The first was during April 24-25, 2012, when members had several meetings with many of the affected communities,

including fishworkers in their traditional coastal settlements or *bunders.* Meetings were also held in the villages of salt-pan owners and workers, *maaldharis* or pastoralists, local women in large numbers, people involved in the agitation against the power plant, and local experts like veterinarians, etc. The team also visited both the intake and outfall channels, observed the mangrove areas that were destroyed, witnessed the environmental impacts, and observed the larger area around this project.

The places/settlements visited and communities with whom the team interacted with during its first visit to Mundra are:

- Tragdi *Bunder* (fishing settlement/ landing area)
- Salaieh fisher-folk village
- Tata /CGPL's intake and outfall channels
- Kuthdi *Bunder*
- The Adani SEZ port area (from outside)
- Bhadreshwar Village
- Bhadreshwar *Bunder*

During its second visit from May 19-21, 2012, the team met the CGPL/Tata Mundra management at their office, spoke with fish-workers and *maaldharis*, and a large group of local affected people publicly deposed before the team at Bhadreswar village. During this visit, the fact-finding team also requested the State Pollution Control Board, the Gujarat Human Rights Commission, and the State Women's Commission to send representation to the fact-finding team on the project, but none of them responded. During the course of this second visit, the team also visited the intake and outfall channels again, tried to reach the ash pond of CGPL, and took a few relevant measurements of environmental parameters. The fact-finding team also requested the CGPL management to take part in the public deposition by affected people at the Bhadreswar village, and they agreed. However, none of their representatives turned up for the meeting and no reason was provided thereof.

Women of Bhadreshwar Randh Bunder meeting the fact-finding team.

The fact-finding team further met in Delhi on the 23rd of May to discuss its findings and to decide on the structure and contents of the report.

Section II - Background

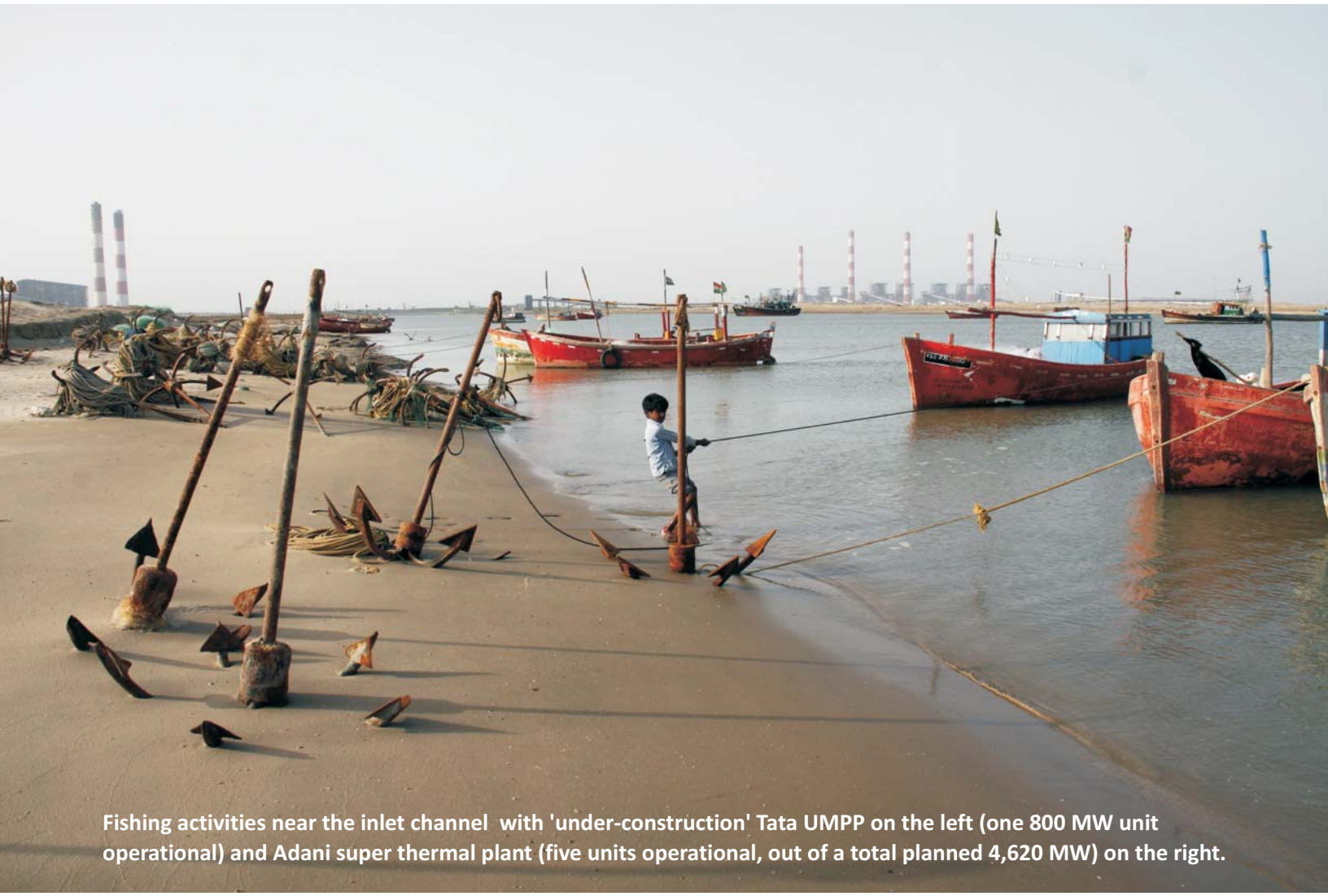
A Brief Background of Kutch Coastal Area

The northern shore/coast of the Gulf of Kutch – where Mundra is located – has seen large-scale industrialization in over little more than the last decade. There is a very large Special Economic Zone (SEZ) created by the Adani Group, as well as the largest private sector port with coal terminals and other facilities by the same industrial house. The same group is also building a huge 4,620 MW coal-based thermal power plant within the SEZ area, several units of which are already operational. Other polluting industries like metal forging have also come up and other coal power plants are being proposed and pursued. The OPG group is also preparing to set up a large coal-based power plant in nearby Bhadreswar, which is also facing strong resistance from local population. Thus, in little more than a decade or so, this largely rural but thriving local economy – fishing, salt-making, animal husbandry, and agri- and horticulture being the four primary economic activities – has been subjected to huge amounts of pollution, land-use change, displacements, denial of traditional rights, and other impacts.

Figure 1

Satellite map (Google) of Gulf of Kutch, superimposed with northern coastal Talukas. Kandla port and other infrastructural facilities are close to Gandhidham. Mundra in the middle has seen a large number of coal power plants coming up, along with the Adani Mundra port, etc.[1]

These are not the only mega industrial projects in this fragile land. In the year 2007, clearances were given by the appropriate authorities in the Centre and state government of Gujarat for the Tata Power company to set up a 4,000 MW Ultra Mega thermal power project – called the Coastal Gujarat Power Limited (CGPL), based on imported coal and the more efficient super-critical steam technology – in the coastal areas of Mundra Taluka in Kutch district of Gujarat.
The Tata Mundra Project – This 4,000-megawatt power plant is being developed by Coastal Gujarat Power Limited (now



Fishing activities near the inlet channel with 'under-construction' Tata UMPP on the left (one 800 MW unit operational) and Adani super thermal plant (five units operational, out of a total planned 4,620 MW) on the right.

a subsidiary of Tata Power) on over 1250 hectares of land near the village Tunda-Wand, close to the port city of Mundra in the coast of Gulf of Kutch in Kutch district (India's largest district with an area of 45,652 km^2) of Gujarat state. This is one of the first Ultra Mega Power Projects (UMPP) and has been established as one of India's first 800-megawatt unit 'supercritical steam' technology thermal power plants, which is claimed to be an energy-efficient coal-based thermal power plant. It is designed to use low-ash imported coal from Indonesia, and thus is located in the coastal area adjacent to a port. According to the Tatas, this UMPP will burn about 12-13 million tonnes of imported steam coal – of much better quality and with much lower ash content than Indian steam coal – each year. As in the case of other UMPPs, this project proposal was also initially nurtured by the government-owned Power Finance Corporation of India, and then through a competitive bidding process Tata Power took this over by quoting the lowest levelised power tariff of Rs.2.26 per kWh. This 4,000 MW UMPP consists of five units of 800 MW each and is projected to cost around USD 4.14 billion. A consortium of Banks including multilateral agencies and Exim Banks have invested in this project. External Commercial Borrowing (ECB) includes the International Finance Corporation, the Export-Import Bank of Korea, Korea Export Insurance Corporation, the Asian Development Bank, and BNP Paribas. National financial institutions (NFIs) involved are

State Bank of India, the India Infrastructure Finance Company Ltd., Housing and Urban Development Corporation Ltd., Oriental Bank of Commerce, Vijaya Bank, State Bank of Bikaner and Jaipur, State Bank of Hyderabad, State Bank of Travancore, and State Bank of Indore.[2]

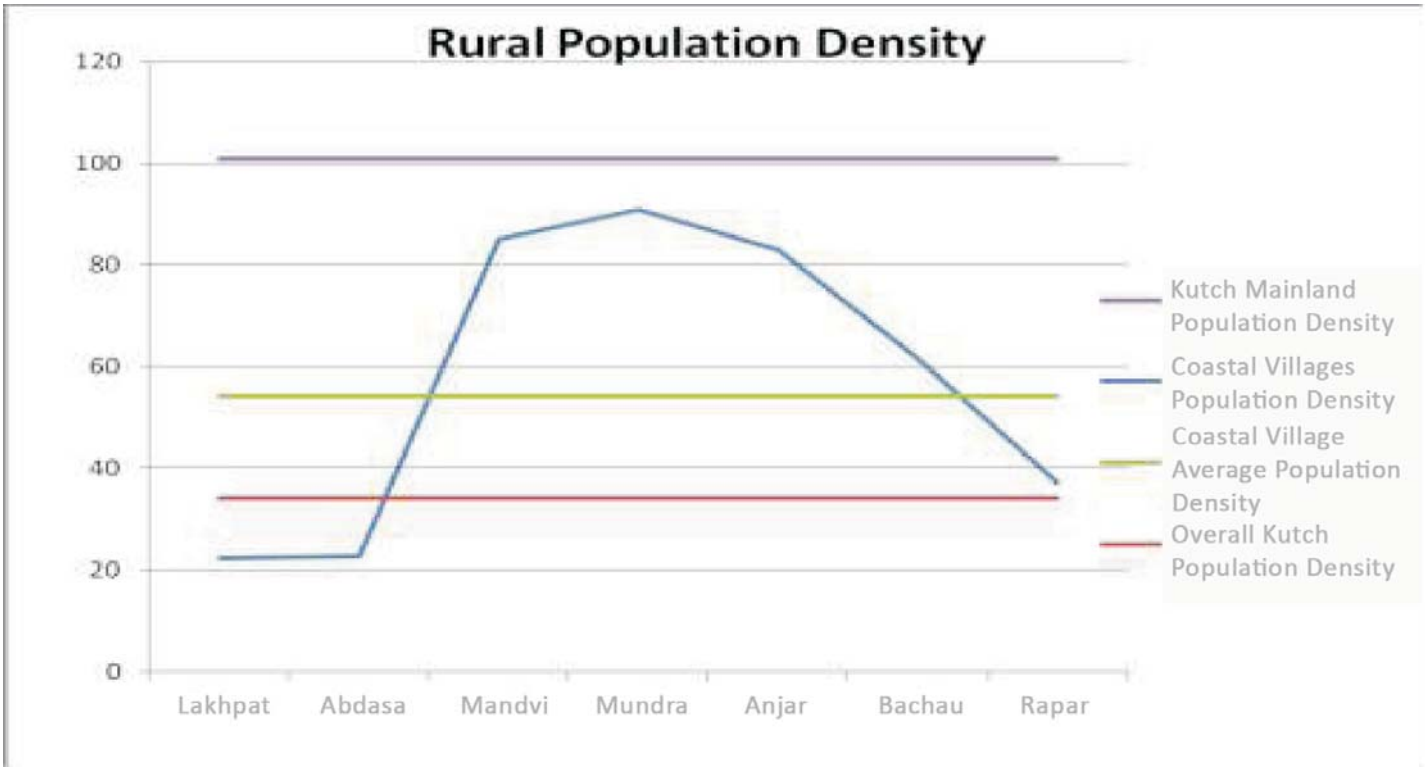
CGPL have entered into power purchase agreements with five state governments – Gujarat, Rajasthan, Haryana, Maharashtra, and Punjab – to sell the power generated. This UMPP was one of nine similar projects planned across India, supposedly to take care of the large electricity shortage in the country, and to provide "cheap and reliable" electricity to "improve the competitiveness of Indian manufacturing and service industries," and also to "improve access to electricity in rural and urban areas of the country while reducing the subsidy burden on state governments"[3] – a direct benefit from the low projected cost of this power, over a long time frame. The logic of locating such a huge coal power plant in a fragile and sensitive coastal zone, as given, is the difficulty of getting large amounts of coal from the already bottle-necked coal production from Indian coal mining operations, and the potential availability of high quality (low ash) and 'cheap steam coal' from overseas sources, particularly Indonesia, Australia, and South Africa. This is where the nearby port and coal terminals of the Adani group contribute with their ready infrastructure.

Mundra Taluka, where this plant is located (as well as neighbouring coastal talukas), is also home to a large number of fishing families, whose livelihood depends on fishing in the Gulf of Kutch. **A migratory fishing community, they live in fishing settlements – called *bunders* – for 8-9 months each year, and go back to their villages for the rest of the period.** When the monsoon comes and the Gulf waters are rough for their small boats, they practice a special form of shore-based fishing, called *Pagadiya* or on-foot fishing. These fisher-people in the settlements of Tragdi *bunder*, Kuthdi *bunder*, Juna *bunder*, Saleiha *bunder*, and Modhva *bunder* come from the villages of Vandi, Sangadh, Bhadreshwar, Luni, Saleiha, and Tunda-Wandh Apart from fishworkers, the area also sees rural economic activities of salt-making, animal–rearing, and cash crop cultivation – castor, sesame, cotton, coconut, sapodilla (chikku), and dates being the most important ones. **Being one of the very few areas in Kutch where groundwater fit for drinking and opportunities for agriculture is available**, Mundra also sees more intensive forms of agriculture than most other areas of Kutch.

To understand the possible and actual impacts of such huge industrial/polluting projects on the local environmental and social fabric, we need to look at the area's local economic activities, specificities of its ecology, and its social identity. Gujarat, having the longest coastline amongst the Indian coastal states with its 1640 km-long coast, and the continental shelf in this section of the Arabian Sea being wider, has a large shelf area with low water depth of 0-50 meter. This condition is even more favourable for the Gulf of Kutch and makes it possible for even smaller traditional fishing boats to catch and utilize the marine resources. The state also has very good estuarine potential. Out of the approximately 179 fishing villages and 173 fish landing centres that existed in the 11 coastal districts of Gujarat (as per 1987 data, more recent data shows more fishing villages, but fewer landing centres, some likely wiped out by new ports and coastal industries), Kutch district alone accounted for nearly 30% of the total.[4] Large parts of the total area of Kutch district, about two-thirds or 30,000 km^2, belong to the salt-desert, Rann of Kutch, a harsh, salinated, very low-agricultural productivity land, where salt-making is the primary economic activity. There is also the large area of economically and ecologically important Banni Grasslands. The result is that most of the rural population of Kutch live and earn their livelihoods near the coasts, which are economically very productive. Though the population density in rural Kutch is low, the coastal talukas have a much higher population density owing to coastal resources and the resulting local economic opportunities. Out of these, Mundra and adjoining Mandvi clearly seem to have the highest rural population density.

Mundra in the southern region of Kutch is the smallest block with a coastline of 72 km stretching across 10 coastal settlements. A study by Fisheries Management Resource Centre (FishMARC) and Kutch Nav Nirman Abhiyan describes the region thus: "*The **Mundra-Mandvi area has the highest concentration of rural people in the entire Kutch coast**. 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. **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 fish and several rare marine species. The mangroves of Kutch are the second largest***

Figure 2



Population density in Kutch district by taluka. Mundra and Mandvi Talukas have the highest rural population densities, owing to the rich coastal natural resources.[5]

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".[6]

When large-scale industrial developments take place in such sensitive ecological zones and amidst such a thriving, natural-resource dependent rural economy, it is very likely that massive damage will be done to these fragile ecosystems and the nature-dependent societies. Thus, large polluting industries should not be permitted in these kind of sensitive zones in the first place. Even if some industries are allowed, extra care has to be taken to minimize the environmental and social damage. Both the industry and its licensing/supporting/financing institutions need to be extra cautious about minimizing any possible damages to these rare, sensitive, bio-diversity-rich zones of the Gulf of Kutch coast. **The fact-finding team explored and tried to find details about safeguards, impacts, and actual measures taken.**

Section III - Meeting with the Company

The team met with the senior staff of the company on May 19, 2012. The company was represented by: Mr. K.K. Sharma, CEO – CGPL; Mr. Ravi Puranik, Head, Corporate Responsibility – CGPL and Tata Power; Mr. Prashant Kokil, Head, Corporate Environment – CGPL; Mr. Debu Mahapatra, Head, HR – CGPL; Mr. Vishal C Shah, Sr. Manager, Corporate Environment – CGPL; Mr. Pradeep Ghosal, Chief Manager, Corporate Responsibility – CGPL; Mr. Homi Mehta, Head, Administration – CGPL; and Mr. Saurabh Sharma, Assistant Manager, Corporate relations – CGPL.

The company listed the corporate social responsibility activities they are undertaking for the villagers. This included starting two co-operative cattle sheds – Tunda wand Goshaala Charitable Trust and Mota Kandagada Goshaala Charitable Trust; organizing around four medical camps which were attended by 300-400 people from the community, and forming Self Help Groups for the fisher folks.

The company said UMPP is a high-end technology which requires operation in caution and hence it was required that boundaries and walls be created, justifying the construction of boundary walls and cutting off the access roads for the fisherfolk.

With respect to employment, only three local people have been given jobs by CGPL. CGPL officials added that more people were waitlisted. They were also looking out for candidates who have completed diploma courses. Since the people who have applied were just 10th or 12th pass, the company stated, “Many of the villagers are not qualified for the job as UMPP involves high-end technology which most of them do not possess. They have poor confidence and hence do not take up these jobs. If only they are willing to learn, we will recommend them to the technical institutes in order to employ them in the power plant which in turn, we believe, will increase their interest and fervor towards the project.”

The fact-finding team meeting the CGPL management at their office.

However, given the hazardous nature of the project, even the presumed benefits of direct employment are questionable.

The company stated that from January-September of 2011 they spent time interacting with the community members and leaders of MASS. They invited MASS and its members for a meeting which was organized by the Vivekananda Research and Training Institute (VRTI) at Mandvi in February 2011. The major point that they wanted to put forward was that “we are going to be here for the next 25 years and hence, let us build a generation together with the community.” MASS did not attend this meeting as there was a mismatch of interests.

The company said that the fish catch declined in the past few years, even before the Tata project was commissioned. The temperature levels of the outlet water were to be maintained at 4-5°C above the mean sea temperature. This is lesser than the government-prescribed limit of 7°C. But, there was no explanation of why, the 7°C limit would not be breached once all the 4000 MW units became operational. They said they have so far never ever given attention to chemicals in the outlet water, as the water taken from the inlet is passed out through the outlet and it never undergoes any chemical process. Since the team told them about the possibility of chemical content, the company agreed to conduct the required tests.

With regards to coal dust they said they are getting the coal from Indonesia. The imported coal they get is comparatively smaller in size (20-50mm) thus, it is not crushed and hence the dust never flies out of the wall. They claimed not to have destroyed any mangroves.

They also denied that fishworkers' access to fishing grounds has been drastically curtailed or banned altogether because of the construction of inlet and outflow channels, even though the latter is 7 kilometers long and divides important portions of the creek.

Section IV - Concerns, Investigation, and Findings

The Major Concerns and the Observed Impacts/Findings of the Team:

I. Failure to recognize and consider the pre-project social, economic, and environmental conditions – The promoting company, CGPL, and the different government bodies, including MoEF, Pollution Control Board, etc. who cleared the project have either failed to recognize or willfully ignored the pre-project existing situation in the project area. The EIA of Tata Mundra UMPP says – "*The project area covers 1,254 hectares (ha) of vacant land near the villages of Tunda and Wandh, including 202 ha of right of way outside the project boundary, and is about 2 km from the first-phase development area of the Mundra Special Economic Zone (MSEZ), where a 660 MW power plant project, the Adani Power Project, is being implemented by Adani Power Limited*."[7] With the area having a high rural population density, and the land having multiple rural economic activities (fishing, fish-drying, animal-grazing being the main ones) for the last many decades at least, clearly the company either didn't make the minimum efforts to see or even deliberately ignored this obvious reality. **They failed to recognize that the natural resources in these coastal areas have provided for the locals in ample measure for generations, and any large scale disturbance or damage or denial of access to these resources will also hurt people's economic independence and well-being.**

Children living at the Kuthdi *bunder*, their home and playground for 8-9 months. However they are not counted as affected people.

Unlike the company claimed, the land is not vacant, but is being used by hundreds of fisher-people families, pastoralists, etc., for many decades. As has been seen, the fishing settlements were not only using this land for their hutments for 8-9 months a year, but were also utilizing this land for boat landing, fish drying, net mending, and a multitude of other related activities. As the fact-finding team observed, it is not only male fisher-folk who inhabit these *bunders*, but in fact entire families inclusive of elders, women, and children who live here, thus making these *bunder*s centres of economic and social activity. Therefore, contrary to being 'vacant land' as claimed by the company, these are dense rural settlements in which local livelihoods depend on these 'common lands.'

"The Tatas and Adanis call these thermal power projects as development, but I barely see any kind of development happening here. Our fishing season is from August to mid May but owing to their outlet and intake pipes, the hot water and the pollution, we are packing our way back to our villages now in April. Not enough fish this year so we are going back early... What is development to us? They have come to us and said they will build toilets and give us free services... Why do we need those toilets? All these years we were managing without any. Let them leave us on our own, we were happy earlier."

Ahmed Ali Illiyasa (Fisherman and Head, MASS), April 24, 2012.

As the fact-finding team found, apart from having the vibrant rural settlements, the other well known fact that this whole area is a very sensitive, biologically-diverse coastal zone, requiring special environmental protection was available in many reports and studies – one of the later studies being supported by one of the Tata Trusts itself.[8] There are other earlier studies available, and this is considered a part of an established fact in the concerned circles, that this area abounds in mangroves (much of it destroyed now by these industries), creeks and estuaries, and coral reefs, thereby contributing to this area being a rich fishing ground. Yet neither the company nor the licensing authorities made any efforts to avoid this ecologically fragile area, or treaded with the warranted caution and care. This negligence is very stark, and stands out in the huge USD 4.14 billion category 'A' project!

Both the Rapid and Comprehensive Environmental Impact Assessment (EIA) reports are also questionable. The impact assessments were carried out by TCE Consulting Engineers – a Tata-owned venture. Their credibility is, therefore, highly questionable.

"Nobody spoke to us about our views about issues and the consultation or public hearing ('Lok Sunwayi') never happened in our place … The Tatas conducted one public hearing which was well after their plant construction had started. Only 8 people from the village of Saleiha attended the same.... These public hearings are looked at more from a procedural aspect to fulfill the criteria for getting their clearances. We are uneducated, we protest till we turn hungry, become their victims and fall for their paltry compensation."

Ahmed Ul Bhai (fisherman cum seller), Sanal Mehta, Jagdish Dadhu and other villagers of Saleiha. April 24, 2012.

II. Many project affected communities were not consulted properly or even recognized – In our interactions with the fisher-folk in these settlements as well as in the villages, repeated complaints were received of the company not consulting most of the affected communities. Relevant information was neither provided nor translated into local languages.

The *maaldharis* or pastoralists/animal husbandry-dependent people also had similar complaints. The Tata EIA says: ***"In the course of the environmental and social assessment, a public hearing was held on 19 September 2006, and further consultations were subsequently conducted in villages."*** As the company **did not even recognize the existence of the hundreds of fishing families** in the *bunders*, it seems that the communities' complaints regarding not being consulted are true. Though some villagers talked about some kind of consultation being held (corroborating the Tata claim of holding one), none of the community members could remember any material being distributed about the power plant or its possible social, environmental or local economic impacts and their mitigation, in any languages they understand. Some of them also complained that the concerns raised by the few villagers present were not recorded.

Non-inclusion of salt-pan workers/owners and pastoralists as affected communities – Most of the villagers complained to the fact-finding team, that the large number of salt-pan workers in the area have not been considered as project affected persons, even though their livelihoods are being affected in multiple ways.

III. Large areas of mangroves, dry-land forests and biodiversity-rich creeks destroyed – In their interaction with the fact-finding team, the CGPL management claimed that they have not destroyed any mangroves or forest areas. But this was a repeated complaint from most of the locals. Members of MASS showed photographic evidence of this destruction. Even when the fact-finding team was visiting in April 2012, it saw earth moving machinery of the Tata

> "The significance of mangroves in coastal ecosystems is un-debatable. 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**."
>
> Kutch Coasts – People, Environment and Livelihoods (2010), a Sir Jamshedji Tata Trust supported study.[9]

Mundra/CGPL, leveling and clearing the coastal mud flats and adjoining areas, which it otherwise saw always covered with some natural vegetation in other places. As is well known in relevant circles, these vast inter-tidal zones and mangroves are rich in biodiversity and need protection.

It seems that the company was either ignorant or deliberately ignored this wealth of information about the area chosen for the project, and thus stands responsible for the destruction of this important ecosystem.

Heavy machinery clearing mud flats and mangroves

The area abounds with **natural creeks** and estuaries , which are normally covered with mangroves, resulting in this area acting as a nursery for a variety of marine animals. The Tatas have deliberately destroyed the rich ecosystem of some creeks, to use these as their water intake (common with the Adani plant, but with 'hydraulic capacity' increased by dredging and training) and

outfall systems. In spite of these destructive intentions being mentioned in their EIA, none of the license/clearance-giving bodies took timely action!

Both the creeks mentioned were dredged (as the Tatas said they would do), denuded of their rich vegetation, and turned into dead water channels. This is an irreparable loss to this rich ecology. In addition, this has badly impacted the fish availability in the region – particularly the high value lobsters, which have almost disappeared, as reported by many of the local fisher-folk.

Local fisher-folk pointing to the 'dredged, trained,' and denuded creek, that is now a dead water channel carrying hot and polluted cooling water out to the gulf. Fresh soil and 'rock' visible in the foreground. Fishers also pointed to the damage done to the coral reefs by dredging.

"The seawater will be pumped at the end of an inlet channel connecting to Kotdi Creek. Spent cooling water, warmed to about 7 degrees Celsius (°C) above ambient sea water temperature, will be discharged back into the sea through a ***discharge channel opening to Mudhwa Creek. Kotdi Creek, about 3.5 km long, will be dredged and trained*** *to enhance its hydraulic capacity…."* [10]

IV. Loss of livelihoods of fisher-folk, drastic reduction in fish catches, resulting in economic and social difficulties for fishing families – The destruction of mangroves and creeks has badly impacted the fish availability in the region – besides the high value lobsters, another economically important fish, Pomfret, has also come down drastically, as reported by fisher-folk from many villages. Even the bread and butter catch of the local fishers, the Bombay duck, is fast declining. The fact-finding team found fisher-folk families winding up their hutments from the *bunders* in the 4th week of April itself, instead of continuing until mid-May as is usual. Many families were found to have already left the *bunders* by April 24, 2012, (when the fact-finding team first visited the area), and the reason given was lack of fish catch. In Saleiha village, villagers were unanimous in telling us:

*"**The fish catch has greatly decreased because of the water that comes out from the TATAs and ADANIs outlet pipes**. There are no fish on the bank and we have seen a drastic decline in the last 3 years. Saleiha is a place where there used to be tonnes of lobsters and we used to be the no.1 in lobster sales. Now, the sales and catch has reduced from tonnes to kilograms. Pomfret and lobster were the specialty products of our village. The catch has reduced 75% in the last 3 years. We also find the water turbidity has increased due to the SEZ and the power plants thus the marine life is disturbed.*

5-6 fishermen go in a boat to fish; they fill diesel for Rs. 3,500 and roam around the sea for a day. At the end of the day we face a loss or we just manage to break even. If our lives continue to lead this way we would definitely have to run away from our villages and look out for some alternative jobs. 'Yeh Vikas nahi hai, Vinash hai!' (This is not development rather devastation of our lives)." Villagers in Saleiha, April 24, 2012.

Towards the end of the meeting with the villagers, a dejected looking Fakir Abdullah Mohammad, introduced as the best fisherman of the village, walked in. He had a catch of four medium-sized Pomfrets to show for his share of the entire day's labour plus fuel and other expenses, which came to nearly INR 4,000, while the sale of these pomfrets will give him much less. Reluctant even to answer our questions, he just held his full day's catch for us to photograph, and for others to ponder – how long can this injustice last for the victims of such 'development'?

And all the assembled villagers confirmed: the story of Fakir is the story of their entire community, on the brink of an unfolding disaster of someone else's making.

The best fisherman of Saleiha village, with his entire day's catch.

Some of the elderly fishermen gave us these approximate figures (in the box below) to show how the catch has declined in the last few years (it has to be remembered that the impact of the Tata Mundra plant is over and above the impacts created by the Adani coal power plant, Mundra port, and other industries – and yet, no cumulative impact study has been conducted here). As is clearly visible, contrary to claims that the power plants and industries would better the lives of local people, the fisher-folk in this area are getting poorer and facing harsher conditions due to the setting up of these industries.

Till 2004-5, 12 boats (4-6 persons in each boat) in this *bunder* used to get INR 25-27 lakhs worth of fish each year.
In the year 2010, 16 boats were used here, netting only INR 21 lakhs of fish for the year, and in 2011, 21 boats were used here, but the catch was worth only about INR 9 lakhs.

Since this is one of the major problems and is affecting the majority of the locals who are fisher-people, the fact-finding team made some more detailed enquiries about actual fish catch and how it varied for different important species over the last three years (once the Adani plant started). It has to be emphasized here that the effect of Tata Mundra outfall channel water temperature and possible chemical pollution, though already visible on the ground, will come into 'data and statistics' at least a year later, maybe more. The declining catch figures from the last few years – if any – will show impacts of the already running Adani power plant, which will be an indicator of bigger impacts to come. The Adani 'super Mega' power plant is designed as the largest coal power plant in India (and the 5th largest in the world) as of now, with a final capacity of 4,620 MW. It is to be noted that Adani Mundra started generation in July 2009, and by December 2010 five units, including one 660 MW supercritical unit (India's first), were operational, already making it a super thermal power plant. Thus, the impacts are likely to already be large, and to be increased with more units by Tata.

The following figures were obtained from two *bunders*, Saleiha and Tragdi, and from the data for a large variety of fish (only the more important fish-catch figures are being quoted here):

Table 1.

YEAR	Bunder	Fish Trader	Prawn Boil Dry	Prawn Dry	Pomfret <50	Pomfret >50	Lobster >100	Lobster small
2009-10	Saleiha	Abdul Bhusar	NA	–	–	110	1714	–
2010-11			NA	–	–	00	137.4	139
2011-12			NA	–	–		125.5	37
2009-10	Tragdi	Juma Reliya	63	1426	49	24	3.3	4.0
2010-11			86.5	148	79	48.5	0.4	00
2011-12			06	21	18.5	2.5	00	00

As can be seen, the local fisher-people's complaints about drastically reduced fish catch for the economically-important species is backed by actual data, and the economic hardship resulting from this is easy to foresee.

Possible factors contributing to the drastically reducing fish catch in this area over the last few years can be identified as follows:

- One of the major factors identified by almost all was the **destruction of creeks and mangroves** (with the Adanis contributing on a much larger scale), which are nurseries of marine life, as described earlier in this report. Both the Kothdi and Mudhwa creeks have been badly damaged by Tata's dredging, widening, and denudation.
- Another major factor identified by the fishing community is the **thermal pollution from the power plants – the warm cooling water coming out of their outfall channels**. This is a very large volume of warm water mixing with the Gulf water here. The CGPL claimed that they have permission from the Ministry of Environment and Forests to discharge cooling water at 7^{o}C above ambient. However, there was no document available to show that the Environmental Clearance given by the Ministry of Environment and Forests on March 2, 2007 in which, a closed cycle cooling system was a precondition (against an open cycle cooling system which the company is operating now), was amended.
- **In such a sensitive area, this will have a huge negative impact. This is also a violation of their environmental clearance, which was for a closed cycle cooling system.** The adjacent Adani super mega coal power plant is building its so-called closed cycle cooling system with an array of forced-draft cooling towers visible, reducing required cooling water volume by nearly 90%. **The failure of the Tata Mundra plant to adopt a closed-cycle cooling system, as permitted, raises concerns as to whether they are cutting corners in order to increase profits.** Further, no cumulative impact studies were done to ascertain the impacts of warm water from all these power plants in this small area.
  The other likely impact of warm water is de-oxygenation – as a result of the increased temperature in the areas around the cooling water discharge, the dissolved oxygen level in the water is likely to go down, affecting all kinds of marine life very badly. This has a direct consequence for communities dependent on marine resources in these coastal areas. This has not been taken into account by the company.
- Another possibility pointed out by the marine scientist in the fact-finding team was the **possible death of large numbers of fish seedling with the pumped intake water**, unless high technology special filters are used. The fact-finding team specifically asked the CGPL management about this on their meeting in their office on 19th May afternoon, but **the CGPL could not give any specific information, giving us the impression that in all likelihood they are not using any such screening device. It may be noted here that while in most countries IFIs insist on such safeguards – with US EPA documents indicating that any intake rate over 2 million gallons/day should follow those safeguards – no such conditions were set forth by them here.** *"….2 million gallons per day intake threshold, over which facilities fall under this rule. The literature indicates that the mortality due to impingement and entrainment increase dramatically above this threshold."*[11] **The CGPL's proposed intake rate at full capacity is 15.12 million m^3/day, or about 3,994 million gallons/day, about 2,000 times the high-damage threshold! Even with just one unit operational, this is higher than the high-mortality threshold by nearly 400 times!**
- The **possibility that chemical pollution is also being discharged** along with the cooling water, causing change in the chemical property of the water, is detailed later. This is indicated, as stated, by the persistent frothiness.
- The **highly salinated brine, discharged from the desalination plant** of the power project, might also be increasing the salinity/changing the pH of the water, driving fish away. As the Tata EIA says, "Rejects from the desalination plant will be discharged into the sea through the discharge channel of the cooling water system," and this is a substantial volume of brine (reject) added to the gulf shores everyday.

> "The power plant will have a once-through cooling system using seawater. The seawater requirement will be about 15.12 million cubic meters per day (m^3/day) of which about 14.99 million m^3/day will be for condenser cooling and 0.1278 million m^3/day for producing freshwater. The seawater will be pumped at the end of an inlet channel connecting to Kotdi Creek. The spent cooling water, warmed to about 7 degrees Celsius (°C) above ambient sea water temperature, will be discharged back into the sea through a discharge channel opening to Mudhwa Creek."
>
> From Tata EIA

To test for some of these factors, the fact-finding team went and took water temperatures in three nearby points in the Tata Mundra outfall channel, hardly 600 meters from the outfall point (where it falls into the Gulf). These were found to be consistently between 32 and 33 degrees Celsius (on 21st May, at around 11:00 AM), far higher than the usual surface water temperature in the Gulf of Kutch during the 3rd week of May and probably extremely harmful to many species of aquatic life. This difference is following only one operational unit of the proposed five 800 MW units! From the research communication published in Current Science, by E Vivekanadan et al., we can see that the max sea surface temperature (towards the end of June) in the Gulf of Kutch does not reach more than 30.85^{o} C in peak summer, that too for a few days only.

Table 2. Thermal threshold and Degree Heating Months estimated for five coral reef regions in the Indian seas based on the estimates from 1998 bleaching events; mean SST is for the **period 1985–2005 (modified from Vivekanandan et al. 13)** [12]

Region	Position	Mean SST (^{o}C)	Max SST (^{o}C)	Duration of high SST (days)	Thermal threshold (^{o}C)	DHM
Andaman	11°21'N; 92°59'E	28.60	32.15	52	31.4	1.07
Nicobar	7°50'N; 93°50'E	28.70	32.00	45	31.0	1.18
Lakshadweep	10°57'N; 72°63'E	28.71	32.05	38	31.4	1.57
Gulf of Mannar	9°38'N; 79°31'E	28.28	31.00	80	31.4	1.14
Gulf of Kutch	**22°5'N; 69°33'E**	**26.10**	**30.85**	**33**	**30.0**	**0.75**

It is also known from many published literatures that fish tend to move away or suffer in abundance even with a 1^{o} C change in water/sea temperature. According to the NOAA's (National Oceanic and Atmospheric Administration of the US) report on 'Climate Variability and Marine Fisheries,' "many species of fish occupy limited areas of the world's oceans defined by narrow temperature ranges." Thus, **four to five degrees warmer water falling into the Gulf throughout the year is sure to cause major disturbance in the eco-system, and drive away most fish species from that region, as most fish are known to be highly sensitive to temperature and chemical pollution. And this temperature difference and the warm water discharge volume are both likely to increase with commissioning of more units.**

V. Denial of access to fishing and grazing grounds, blocking of access roads – A major complaint of both the fisher-folk and the pastoralists was that their access routes to fishing and grazing grounds have either been blocked or unusually lengthened by Tata Mundra's water channels. In many cases they face a boundary wall or other barriers. The fact-finding

"We are really tired and weak now. Initially they didn't let us catch fish during the peak times like August as they were building roads from August to November, blocking us from reaching our catchment areas... And now they are the reason for us returning home disappointed, nearly empty handed and early. Two years ago, we used to spend just Rs. 150 for our travel by auto-rickshaws, from our village to Tragdi *bunder*, now we spend nearly Rs. 450 owing to the lengthy routes, road blocks, and constructions. Transport, the diesel spent for the boat, our living expenses are higher than what we get out of our catch, we will die in hunger soon."

Harun Kaka (Fisherman, Bhadreshwar), April 25, 2012.

team found this to be true when it visited Tragdi *bunder*. What was once a shorter route has now become lengthier by nearly 4 kms, and the fisher-folk are forced to shell out Rs. 450 for each trip by an auto-rickshaw, in place of the earlier Rs. 150 per trip. The route is also not maintained well and the women folk often are delayed when returning from the markets after selling the fish. This has further implications.

"The roads are closed in turn increasing our travel distance, the outlet pipes have led to reduction of fish catch and the water supply in our villages. Thanks to these companies we now have to take a long walk to fetch water even for our daily activities."

Aminaben

An even more serious problem faces the animal grazers and their animals. Even the fact-finding team members, when going to these *bunders* and settlements, were repeatedly stopped by the Tata Mundra security personnel, at three security gates. Each time we had to explain why we wanted to go to the coast/fishing settlements, at times forced to display our urban credentials.

The local fisher-folk and fish-traders were also repeatedly stopped and questioned. The whole area is home to not only hundreds of pastoral families, but thousands of animals they nurture as means of their livelihood. The Tata/CGPL management informed the fact-finding team that the company has opened a cattle-fodder centre/'gaushala' and the number of cattle in it has increased. The locals explain this increase: denied access to their grazing lands, more of the pastoralists have been forced to go there. However, the proportion of animals that go there is still small compared to the total number of animals, the rest forced into smaller and smaller areas. The number of camels, which ran into many hundreds some years ago, has fallen to virtually nothing after the Adani and Tata projects came up, according to local herders. But the Tatas deny the existence of animals, like camels, altogether.

Table 3. **Impact on Livelihoods - Animal Husbandry**

Village	Cattle	Reqd Gauchar Land (Ha)	Total Gauchar Land (Ha)	Gauchar Land Allotted to SEZ (Ha)	Gauchar Land Remaining (Ha)	Shortage in Reqd Gauchar Land %
Navinal	1753	280	137	94	43	85%
Tunda	1189	190.24	158	86	72	62%
Luni	833	133.24	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	–

Figures of the amount of grazing lands handed over to the industries in this region bring out the extent of pressure that this denial of common grazing land has created (data provided by MASS).

It is to be noted here that this table was produced some time ago, after which point even Mundra has lost its remaining grazing land, aggravating the situation.

Persistent frothiness in the Outfall channel water seen throughout the fact-finding team's visits.

VI. Chemical pollution – The fact-finding team also observed Tata-Mundra outfall channel water to be persistently frothy, indicating some kind of chemical pollution, the source of which they could not determine. No such frothiness was observed either in the water of the intake channel (common for Tata and Adani plants), or in the coastal waters of the Gulf. This clearly indicates that the source of the pollution is within the Tata-Mundra power plant. There is a possibility of some anti-fouling agent being added to the water. There were also deposits observed on the banks of the outfall channel, which need to be investigated.

In their meeting with the CGPL management on 19th May, the fact-finding team pointed this out and asked for explanation. It was met with lack of acknowledgement of this clearly visible fact. The team also suggested to both the CGPL management and the agitating fisher-folk organization, MASS, to get chemical tests done on the collected samples of this outfall channel water – if their (fisher-folk) resources permit. CGPL has not reverted back to us with any test data. An independent water testing initiated by the fact-finding team, with the intake and outfall channel water collected on the 2nd of June, gave the following revealing results:

Table 4. **TATA Mundra – Inlet and Outfall Channel Water Test**

Parameter	Inlet	Outlet
Date of Sampling	02.06.2012	02.06.2012
Salinity - ppt	41	43
pH	7.7	6.8
TDS - ppm	41230 ppm	43910 ppm
DO-mg/l	3.1	2.6
Turbidity-NTU	39 NTU	46 NTU
Colour	No visible colour	Slightly reddish/brownish
Odour	**No smell**	**Strong odour**
COD-mg/l	**126**	**287**
BOD-mg/l	**2.4 mg/l**	**7.8/l**

Thus, it can be clearly seen that some acidic material is being added to the cooling water, lowering its normal pH value. Both the colour and odour are also strong indicators of this. The dissolved oxygen level also dropped significantly,

endangering all marine life. Both chemical and biological oxygen demand (COD/BOD) figures have increased sharply, indicating significant levels of pollutants. This also indicates increased stress on marine life – fish and their food chain/ system being of primary concern here – dependent on the available oxygen in the water.

It needs to be understood that due to the largely-enclosed geography of the Gulf of Kutch, pollutants cannot spread out freely onto the open sea, and tend to get concentrated. This will magnify the adverse impact on marine life in the region. The boats used by the local fisher people are also small, thus preventing them from venturing out to the open sea – which they have no experience of, or had no need for – as the interior of the Gulf was a plentiful source of fish until recently. The centuries-old balanced existence is now changing for the worse, negatively impacting fisher-people who are themselves not responsible for this change.

VII. Ash contamination of drying fish, salt, and green fodder – Another major area of concern that the locals repeatedly raised is about dust and ash from coal and fly-ash. The open spaces in and around the *bunders* are used for drying the fish for later sale, vertically on bamboo poles for comparatively higher value fish, and on the ground, over spread-out

In the *bunder*, drying fish getting contaminated with coal-dust and ash from the power plants. Higher value fish on poles, lower value fish on sheets on the ground.

poly-sheets, for lower value fish. Due to the dust and ash flying around all over the place, **this drying fish is getting contaminated with possibly toxic coal-dust/fly-ash**. The fact-finding team also observed some of the drying fish getting darkened by this coal-dust and/or coal-ash. This is likely to cause problems in marketing such contaminated fish, and is likely to increase with more units coming up soon.

The cumulative coal-use by thermal power plants in Mundra area itself will be around 30 million tonnes, with the more efficient CGPL itself consuming about 12 million tonnes. Even at a conservative 15% ash content for high grade

> "The following equipment/control measures to be provided as part of the project:
> **Flue stacks of 275m height**
> High efficiency (>99.9%) ESP to ensure PM<100mg/Nm^3
> Low NOx burners
> Dust extraction and suppression systems (such as bag filters, water spray systems) in dusty areas (such as coal and ash handling, transfer areas) Ash pond with impervious lining, for disposal
>
> Provision of these measures has been planned and progress documented in the quarterly audit reports of the project. The same will continue to be assessed in the future audits."

imported steam coal, this leads to an annual ash production of 4.5 million tonnes! The effect is similar to about 500,000 standard truck loads of toxic ash being dumped in these windy flat lands each year! Or about 1,370 truck-loads per day, every day of the year! With the sharp increase of imported coal price, and Tata Mundra/ CGPL (and others) reportedly planning to mix high-ash Indian steam coal with the imported Indonesian coal, this amount is bound to climb up sharply. This will lead to an even higher ash generation from all these plants, leading to even more drastic contamination and significant health problems.

This coastal area is very windy for most of the year, thus having a high possibility of raising and spreading dumped ash from the massive ash ponds. Also from a visual examination, it seemed very likely that the chimneys/stacks of the Tata Mundra plant are much lower than the 275 meters usual for such high capacity coal power plants, and as claimed by CGPL.[13]

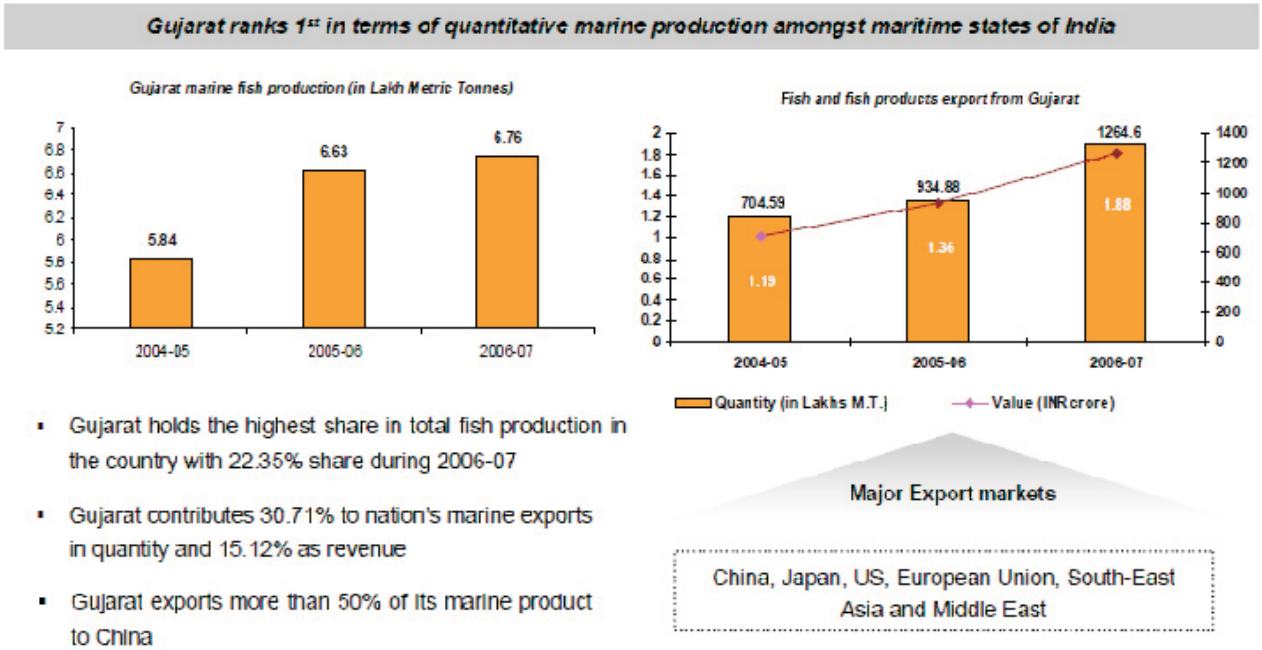
> "Our village is badly affected by these thermal projects. The grazing area inside the village has been reduced drastically. **Our village is surrounded by conveyor belts of the Tata. Even yesterday when they operated the conveyor belt, the whole village got filled with dust.** We have even filed complaints with the Pollution Control Board. The roads which were built initially by the company in order to facilitate the villagers are closed half the time. Since 2009 we were fighting against OPG now against the TATAs. These big companies do not even respect court orders."
>
> Banka Bhai, Cattle rearer in Tunda Village

If so, this increases the possibility of higher amounts of ash deposits in the surrounding areas on calmer-wind days, increasing the problems for local communities. This has been corroborated by complaints of villagers from Tunda-Wandh, sandwiched between the two giant coal power plants, of coal-dust or ash deposits on their roof-tops, even on their bodies when they sleep on their terraces in the night.

VIII. These observations also raise a few serious and larger health concerns. It is well known that **coal ash contains toxic heavy metals including cadmium, lead, selenium, mercury, etc., which are also known to bio-accumulate in animal and human bodies.** [14]

From marine fisheries sources, Gujarat is shown to be the no.1 fish producing state in India, with fish caught here serving large numbers of consumers in India and abroad (figures below). **If the dried fish produced here is contaminated by toxic coal ash – from the large numbers of coal power plants including the massive Tata Mundra UMPP, this might contribute to heavy-metal toxicity-related health problems in a far larger population.** The health concerns from this might also hamper Gujarat's fishery enterprises – small and big.

Figure 3:

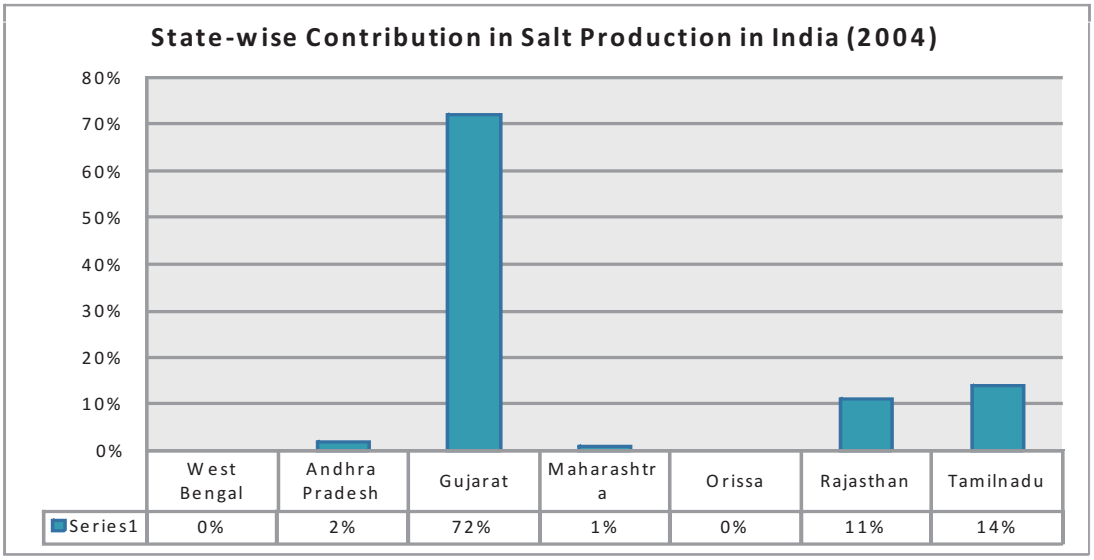


Source: Sector Profile : Food and Agri Business, Gujarat Govt.[15]

Apart from that, the **presence in the air of toxic SPM (suspended particulate matter) is likely to cause serious health problems in the people here**, particularly amongst children and the elderly.

It's not only the dry fish which is contaminated by coal dust/ash; **even the salt produced in this area is reported to be getting ash deposits. Truck-loads of this salt are transported to factories, for refining and packing for human consumption all over India, even exported. With the fine toxic ash spreading all over the wide plains of salt-pans, will it be possible to clean the salt completely? What about the health implications of this contaminated salt on un-suspecting consumers far away?**

Figure 4:



Source: "Saga of Indian Salt Workers," Bay of Bengal News.

Will this coal dust/ash contamination also affect the sale of salt produced here, this being the second major economic activity after fishing?

According to different sources, **Gujarat produces anywhere between 72 to 80% of India's salt,**[16] **and Kutch district alone contributes nearly 30% of that. Thus, over 20% of the Indian population of 1.22 billion consumes salt produced in Kutch. With large numbers of massive coal power plants coming up in windy Kutch, the risk of large amounts of coal**

"Out of India's total salt production, about 75 % is produced from Gujarat. The Gandhidham area is filled with salt-pan workers. ***The salt-pan work is facing a great challenge due to the fly ash as well as dust that is emitted from the thermal projects. Our livelihood is affected by these thermal power projects like those of the fishermen."***
– Bhika bhai, salt-pan worker, Bhadreswar, May 19, 2012.

dust and ash contaminating the salt (which is produced in vast open plains, figure no.) is very real, and any serious contamination risk from toxic coal dust/ash has to be looked into from this massive public health risk perspective. Apart from the ash, even **the amount of coal dust likely to be flying around is a cause of concern** – as can be seen by the experience of villagers. The Tata Mundra plant will have *"…active coal stock and the reserve stockpile at the power plant site will each be approximately 500.000 metric tonnes . . . ,"* and this huge one million tonne coal-stockpile (and the exposed conveyor belts) will be constantly exposed to the strong winds, filling the air with coal-dust.

On the 25th of April, one of the big salt-pan owners, Mr Ahir spoke to the fact-finding team at length about this problem, and how they have resisted the proposed Bhadreswar OPG coal-power plant in their vicinity. They have also offered to buy back the land that has already been acquired for this, even at a much higher price than paid for as compensation – to keep this coal-ash contamination source at bay.

The fact-finding team was also approached by local animal-grazers/pastoralists, to report about unusual increase of diseases in cattle, abnormal abortions in pregnant cattle, etc. These reports were verified by a local veterinarian, Mr Jaipar Singh, who suspected these to be largely intestinal diseases, likely from contaminated fodder. He also reported reduction of milk yields in cattle of late. He additionally reported about a large number of cattle deaths once earlier, when a large volume of polluted water from the Adani plant flooded the grazing lands and the cattle grazed there. These reports seem credible, in the light of scientific evidence of accumulation of toxic heavy metals in plants from coal ash (ref. 13 below), and its increased concentration in animal bodies and animal products, which again raises serious human health issues.

IX. Health impacts of sulphur oxides and nitrogen oxides – CGPL's EIA says:[17]

> "Table 6 summarizes the results of ambient air quality monitoring over the monitoring period from March 2006 to February 2007. The methodology and data for each season is given in Appendix 1. The monitored air quality indicates that values of suspended particulate matter (SPM), respirable particulate matter (RPM^5), sulfur dioxide (SO_2), and oxides of nitrogen (NO_x) are well within the stipulated National Ambient Air Quality Standards (NAAQS) and World Bank guidelines for residential and rural areas, as shown in Appendix 2."

The air quality being well within normal in a rural area, where the polluting power plants were yet to start (the monitoring was done until February 2007, when even the Adani power plants had not started), is to be expected. Curiously, CGPL's Annual Environmental and Social Performance Report 2010-11 does not mention or report the ambient air quality by March 2011, when a few units of the Adani coal power plant were operational. The report clearly indicates (page 04) that a vital piece of equipment to reduce SO_2 emission – Flue Gas Desulphurization (FGD) unit –

was not installed, and only that space has been allocated. Several categories of Indonesian steam coal contain close to or more than 1% sulphur.[18] The FGD units are known to reduce the mortality rates from SO_x pollution significantly, yet the Tata Mundra plant did not start with these. A large US study by the Clean Air Task Force[19] found that in 2004, additional deaths due to fine particles from fossil fuel power plants in the US were nearly 24,000, which in the latest study came down to about 13,000 per year, mainly due to strict air-quality regulations and monitoring. A National Academy of Sciences (USA) study[20] found this coal-plant air pollution-related excess mortality to be as high as 20,000 in 2009. And yet, the Tata Mundra/CGPL management have not installed all possible pollution prevention equipment.

X. Massive contribution to Global Warming – In this age of extreme concerns about global climate change and its adverse effects, particularly on developing countries, pushing for massive coal-powered power plants runs contrary to these concerns. Particularly as coal is the dirtiest and most carbon-intensive energy source, and India is a party to international 'commitments' to reduce its emissions intensity by 25% in little over a decade. The total greenhouse gases emission from the Tata Mundra plant, based on Ernst and Young's estimated baseline CO_2 emissions for the project, would be 30.796 million tonnes per year (baseline value), which would make it India's third largest emitter of greenhouse gases. This would significantly increase the atmospheric carbon load, and put further pressure on our already vulnerable communities.

XI. Impact on local economy, urban and rural – The fact-finding team also observed several visible impacts of this large-scale industrialization on the local economy. There were two visible trends of change. A small section of the urban moneyed class have benefitted from these industries – including the Tata Mundra power plant being set up – as hotels, car-hire, eateries, small supply, and small contracting businesses flourished. There was a visible construction boom even in this remote corner of India. Particularly in the towns, we found those with additional investible resources, and the skills to adapt to new business opportunities, benefitted. On the other hand, almost all of the rural people have suffered adversely, as the natural resources they were dependent on for their traditional livelihoods and jobs have been either taken away or reduced and polluted/damaged.

The primary economic benefit touted by both Tata Mundra and its lenders, that it will provide cheap electricity to local enterprises, thus making them more competitive, is not going to happen, with the Tatas now pressurizing the state governments and the Government of India to increase the basic tariff from the contracted Rs. 2.26 per kWh (unit) to over Rs. 3.06 per unit, mostly on account of the sharp increase of the cost of imported coal.[21] [22] Inexplicably, the company had estimated the cost of imported coal to remain as low as about USD 36-37 per tonne in real terms, over the entire period of the plant's operating life! Furthermore, the failure of IFIs/FIs to question the absurdity of this economic assumption stands stark. Even as only the first Tata unit has just started generation, after accounting for the large transmission and distribution losses (Gujarat has a T&D loss figure of about 27%) and associated T&D infrastructure and management costs, this power is likely to be costlier than that even middle-class urban Gujaratis buy now. It is, therefore, likely to serve the interests of the well-heeled and other high-end commerce and industry only. At the same time, the thousands of fisher-folk in their *bunders* do not have any electricity connection, by way of denial of recognition of their traditional rights, and by virtue of high costs, they will not have access to this new power too. On the contrary, their produce – fish, salt, milk, meat, etc. are seriously threatened and curtailed.

XII. Women's safety, security, and free access to places – In fishing families, women work alongside men, in sorting, drying, and often taking the products to the market. Thus, free and safe access for women to all these areas is a precondition to their daily life and enterprise. In several fishing settlements around the Tata Mundra plant, the issue of local women not being allowed to enter some areas was reported to the fact-finding team by these women themselves. The name of Tata's/CGPL's Korean Colony came up on a number of occasions, as a place unsafe for women and where incidents might have happened. Since the Tata Mundra UMPP is using many Korean-supplied machinery, there is a settlement of Korean workers. Some men folk also raised the issue of the presence of a large migrant labour force being a cause of concern for these women's safety. Instead of taking corrective measure in this regard, the company has decided to ban local women from entering some areas.

XIII. Possible impacts of radioactivity from coal ash ignored – The IFC and the company have failed to take into account

the possible impacts of radioactivity emanating from the coal ash on the people and the animals in the vicinity of the project. As is well known, coal contains radioactive minerals, which gets concentrated in the coal ash.

Keeping this concern in mind, the fact-finding team, during its second visit to the area, carried a Geiger counter/Radiation dose meter. The team tried to approach the newly-built ash pond of CGPL, but could not reach closer than around 300-400 meters from its walls, as there were plant workers and security guards at many places. **Although the project has only recently been commissioned and only one-fifth of the project is operational now, the fact-finding team recorded more than double the radiation dose level around 300-400 meters away from the ash pond than in**

> "At issue is coal's content of uranium and thorium, both radioactive elements. They occur in such trace amounts in natural, or "whole," coal that they aren't a problem. But when coal is burned into fly ash, uranium and thorium are concentrated at up to 10 times their original levels. Fly ash uranium sometimes leaches into the soil and water surrounding a coal plant, affecting cropland and, in turn, food. People living within a "stack shadow"—the area within a half- to one-mile (0.8- to 1.6-kilometer) radius of a coal plant's smokestacks—might then ingest small amounts of radiation. Fly ash is also disposed of in landfills and abandoned mines and quarries, posing a potential risk to people living around those areas."
>
> Scientific American, December 13, 2007.[23]

the villages. Moving around in the nearby villages, we found a reading varying from 0.08 to 0.09 micro-sievert/Hr, while from so far out of the ash pond – with its intervening wall in between – the reading climbed to 0.20 to 0.21 micro-sievert/Hr!

It needs to be clarified that even this higher reading is within the normal range. However, the measurements were not made close to the ash deposit. Moreover, these measurements can be taken as indicative of future impact since this is only the initial phase of storing coal-ash here**. While the fact-finding team does not claim these to be accurate measurements, this does point to the crying need for attention to this aspect and its regular monitoring.** We fear that when the project is fully operational and the ash deposits accumulate, the radiation levels will go up.

As per their own conservative estimates, the Tata Mundra plant alone will consume over 12 million tonnes of coal a year on full operation. This means a minimum of 1.8 million tonnes of ash generation every year, even for the low-ash imported coal. This does not take into account the ash generated from other nearby coal power plants, with a total coal consumption of over 30 million tonnes per year. Further, there are dangers of leakage of coal ash and contamination of ground water. With the area subject to strong surface winds for most parts of the year, there also exists the possibility of radioactive coal ash spreading to even farther villages. No studies have been conducted so far to our knowledge, to assess the impacts or to take any actions to mitigate the adverse impacts. The CGPL management denied any knowledge of this. **Even the IFC India team, in response to pointed queries by one of the fact-finding team members during a tele-conference on May 23, expressed their ignorance on this matter, explaining it was not in the IFC guidelines!** Considering the existing knowledge in this area (even the US EPA has clear figures on this), **this monitoring is an urgent necessity, and this lack of awareness should be considered a failure of IFC policies/guidelines.**

XIV. Large number of people displaced from land and livelihoods and a deeper question – The Coastal Gujarat Power Limited, taken over by the Tatas from the Power Finance Corporation for implementing the first UMPP of the country, acquired over 1250 hectares of land from the villages of Tunda-Wandh. Large areas of common lands, used for grazing- and fishing-related activities, went to CGPL, or became inaccessible to the earlier users. The pollution from the mega plant is also displacing many locals from their settled and secure livelihoods. Yet contrary to the promise, itself founded on dubious cost-benefit grounds, of providing employment to those locally affected and/or displaced, it came to the notice of the fact-finding team from many different inputs that only 3 to 5 locals have been employed in lowly manual and daily wage jobs. The standard explanation offered by CGPL that these people are not educated or skilled enough to work in the technologically developed and mechanized power plant is not convincing. At any note, the CGPL plant has not benefited the local population in any way or helped them improve their standard of living.

The fact-finding team observed that the exchange between the locally affected population and Tata-owned CGPL is hugely unequal. This is based on the above observations and collation of facts where local communities have been forced to part with a large part of their source of livelihood, or have it negatively impacted by the company's entry into the area and suffer the dangers of pollution, affecting not only their livelihood but also their health. On the other hand, having occupied these lands in an ecologically sensitive and valuable area, the company has flouted the norms and

> "We doubt their motives of developing the local community. Educated persons ratio to uneducated is 20:80. Even that 20% who are educated who were called for interviews with the Tatas and Adanis were not given employment yet. I have documents supporting the same and know these graduates who have attended the interview, whose results are withheld or joining dates are delayed purposely."
>
> Ayub Haji, fisherman, Bhadreshwar

procedures that are meant to be followed in the setting up of such a plant, not taken all necessary precautions and safety measures to protect local populations and have not provided an alternate source of livelihood to those the plant has affected. The question that we ask here is on what basis can CGPL appropriate resources for itself while denying others the same?

XV. Large number of polluting mega-industries in an ecologically sensitive area; no Cumulative Impact Studies done or even envisaged – It is not only the two mega/ultra coal power plants that are coming up in this fragile bio-diversity-rich coast. The map below shows the rapid rate at which mega projects are being planned here. With thousands of natural resource-dependent villagers already pushed to the brink, and the valuable ecosystem under serious attack, there is still no sign of a cumulative impact study being planned.

Figure 5

Large number of polluting projects being built in a small, fragile ecological zone - No cumulative impact studies done

XVI. Accountability of financial institutions: Examination of the available documents of the financial institutions, both national and international, revealed that their safeguard policies were not implemented by the company, nor was there strict monitoring by the financial institutions at all stages of the construction hitherto.

As elaborated above, the number of studies and processes which preceded the approval of financing was either not done, or inadequately done, resulting in wrong conclusions. Such wrong conclusions eliminated the chances of mitigating the losses. Apart from making the affected communities vulnerable to serious human rights violations, the lackluster attitude of the financiers towards a thorough pre-approval process resulted in irreversible environmental damages.

IFIs, particularly the IFC and ADB, relied on the reports prepared by the consultants hired by the company to monitor compliance of their safeguard policies. Examination of the three monitoring reports prepared by SENES Consultants India Pvt Ltd., for the period April 2009-March 2010, April 2010-March 2011, and July 2011-September 2011 exposed the serious lapses in the reports. We found it irresponsible on the part of the consultants to copy-paste most of the first two reports. IFC and ADB should initiate proceedings against the consultants for this serious act of fraud and negligence. The monitoring reports also lacked understanding about IFC and ADB policies applicable in this project. If IFC and ADB continue to rely on the monitoring reports furnished by company consultants, they will risk the chances of biased reporting and thus be unable to access the realities on the ground.

While implementation of the safeguard policies in the case of IFIs is dismal, the absence of any such social or environmental policies for the national banks and national financial institutions is a matter of great concern. The national banks/financial institutions financing the project are: State Bank of India, the India Infrastructure Finance Company Ltd., Housing and Urban Development Corporation Ltd., Oriental Bank of Commerce, Vijaya Bank, State Bank of Bikaner and Jaipur, State Bank of Hyderabad, State Bank of Travancore, and State Bank of Indore.

The national banks/financial institutions invest crores of rupees every year in high-risk projects like thermal power projects, dams, and roads, to name a few, and they do not have any policies to ensure that their investments are not causing human rights violations, or social or environmental negative impacts. Had the concerned banks / financial institutions had any policies or measures in place to limit such unconscionable damage, the Tata Mundra project would not have been an example for violations on a monumental scale. Having no policies is no excuse for abetting violations.

Section V - Conclusion

The team, after taking into consideration all the facts and information it had access to, upon meeting the company and the affected communities, and after making multiple field visits to ascertain the facts, comes to the conclusion that:

- The project has disproportionately high social, environmental, and economic costs.
- The company, the licensing agencies of the Government of Gujarat and India, and the national and international financial institutions have either ignored or wilfully neglected the social and environmental high costs and did little to mitigate them.
- The Social Impact Assessment and Environmental Impact Assessment are misleading and erroneous, having excluded a large number of communities whose loss of livelihood was overlooked. Cumulative impact studies required to understand the overall impacts were not done.
- Both the governments and the IFIs failed to earnestly monitor the adherence to laws and their safeguard polices.
- The failure to monitor contributed to the continuance of the violations by the company.
- The governments and the IFIs are equally complicit in the violations by the company.

Section VI - Recommendations

After extensively going through the realities and the impacts of the Tata Mundra Power Plant, and documenting its findings, the fact-finding team feels compelled to provide three different sets of recommendations – one for the company, the second for the IFIs/FIs that financed the project, and the third for the state and national governments.

For the company:

1. Compute and monetize all the social and environmental costs and add these to the project costs;
2. Compensate all local people for their livelihood losses;
3. Create a fund for the restoration of mangroves destroyed;
4. Put a halt on operations until the restoration and compensation are done;
5. Immediately conduct an independent and thorough EIA , post-first Unit operation;
6. Conduct a thorough health survey of the entire population and use it as a baseline data for compensating future damage;
7. Employ all possible pollution control measures on a war footing, to save this fragile zone from further damage;
8. Restore people's access to fishing and grazing grounds, and to salt-pans unconditionally;
9. Provide compensation and medical facilities to help people cope with pollution related problems.

For the Governments of India and of Gujarat:

1. Put a moratorium on permission to any more industry/power plants in Mundra/Kutch;
2. Issue a Show Cause to the CGPL/Tata Mundra for multiple violations of clearance conditions;
3. Constitute independent expert committee(s) to thoroughly investigate all pollution, contamination and radioactivity hazard within a reasonable time frame;
4. Based on any such independent expert report, take punitive actions;
5. Do not subsidize the power produced and sold by CGPL by increasing the contracted tariff;
6. All national banks/financial institutions should be directed to adopt sound social and environmental safeguard policies at a reasonable timeframe and their implementation should be made mandatory.

For the Financial Institutions:

1. The IFIs should undertake an immediate review of the project to examine adherence of their safeguard polices;
2. Until such a review is done, their financial assistance to the project should be suspended. If review concludes that the project is undesirable or unviable, the IFIs should withdraw from it;
3. IFIs should put in place an independent monitoring mechanism to ensure strict compliance of their safeguard policies.
4. National financial institutions should adopt social and environmental policies and should implement them scrupulously in this project. The implementation should be monitored by independent agencies, which include the affected people's representatives.

Annexure I

Brief Bio of the Fact-Finding Team

Justice (Retired) S N Bhargava , Chairperson
Justice Bhargava completed his law studies at Allahabad and then practiced at various courts in Rajasthan and Supreme Court before joining the judicial services. He was elevated to the bench of the Rajasthan High Court in 1993 and retired as Chief Justice of the Sikkim High Court in 1996. Post retirement he has been the Chairperson of the Assam and Manipur Human Rights Commissions. He is currently the Chancellor, IIS University, Jaipur. Justice Bhargava lives in Jaipur and is actively associated with the legal aid mission and other human rights activities.
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Dr. V. Sampath
A marine scientist and former advisor to GOI, Ministry of Earth Sciences, Dr. Sampath has over thirty-eight years of R&D and Scientific/Technical expertise in Fisheries Management and Development. He has represented India in a number of International Consultations/meetings including Indian Ocean Fishery Commission, FAO Consultation on Code of Conduct for Responsible Fisheries, UN Commission on Sustainable Development. He has served as a Consultant for various national and international organizations, including FAO, UNDP, UNEP and was a national consultant for the just concluded World Bank/FAO Fisheries Management for Sustainable Livelihoods (FIMSUL) Project in Tamil Nadu and Puducherry.
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A widely published political analyst, columnist and social researcher, Bidwai's journalistic career spans four decades. His first notable work in journalism was as a columnist for the "Economic and Political Weekly" beginning in 1972. He then worked for magazines and newspapers, including "Business India," "Financial Express," and "The Times of India" between 1981 and 1993, eventually becoming its Senior Editor. Bidwai is currently Durgabai Deshmukh Professor at the Council for Social Development, New Delhi. His latest book is 'The Politics of Climate Change and the Global Crisis: Mortgaging Our Future' (**Orient** BlackSwan 2012)
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Ms. Jarjum Ete
Jarjum Ete was the former Chairperson of the Arunachal Pradesh State Commission on Women. She belongs to the Galo tribe of Arunachal Pradesh and she is the President of the community based body, the Galo Welfare Society (GWS) since January, 2010. She has served as Secretary General and President of the Arunachal Pradesh Women's Welfare Society (APWWS), the pioneer tribal women organisation of the state. She is

currently its spokesperson. Ms. Ete is also the Secretary of the National Alliance of Women (NAWO) which monitors and follows up on the implementation of the pro-women policies and programs of the Govt of India. She was one of the members of the Joint National Committee for Review of the Forest Rights Act, 2006 and recently elected as the President of the National Forum of Forest People and Forest Workers (NFFPFW).
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Mr. Soumya Dutta
Coordinator of the team and primary author of this report, he is the national convenor of Bharat Jan Vigyan Jatha. He is a specialist in energy and climate change issues. He is also convenor of the climate and energy group, Beyond Copenhagen Coalition. He has authored and contributed to a number of national and international publications, workshops, and conferences, and has been a member of high-level committees on energy and climate change.
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Annexure II

Terms of Reference of the Fact-Finding Team

1. To examine the process of public hearing and consultations with affected communities before the project started.

2. To inquire into the issues of exclusion, loss of livelihood, and violation of human rights and other economic, social, and cultural rights.

3. To inquire into the immediate and long-term environmental impacts of the project on the Kutch coastline.

4. To inquire into the role of financial institutions in ensuring protection of environment and human rights, and monitoring compliance of national laws and safeguard policies.

5. To understand the possible cumulative impacts of large-scale industrial expansion in Kutch.

6. To provide the findings along with appropriate recommendations.

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THE REAL COST OF POWER

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The Social, Environmental, and Economic Impacts of
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