

TATA POWER

MUNDRA ULTRA MEGA POWER PROJECT

Towards a cleaner and greener future

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India's Energy Scenario

Starting with an aggregate electricity generating capacity of 1362 MW in 1947, India has achieved significant capacity addition over the last 60 years. At the end of April 2012, the installed generation capacity of the power sector in India stood at 201,637 MW. Despite this, India continues to face formidable challenges in bridging the energy gap due to ballooning energy demand. During the year 2010-11, the country faced an energy shortage of 8.5% and a peak shortage of 9.8%.

Currently, India's power demand is around 150GW. India's peaking power shortfall is set to intensify over the next 10 years and expected to reach more than 70GW by year 2020 from the current peaking deficit of around 30GW.

A bulk of the peak power deficit can be attributed to five key power deficit states – Maharashtra, Madhya Pradesh, Uttar Pradesh, Punjab and Haryana.

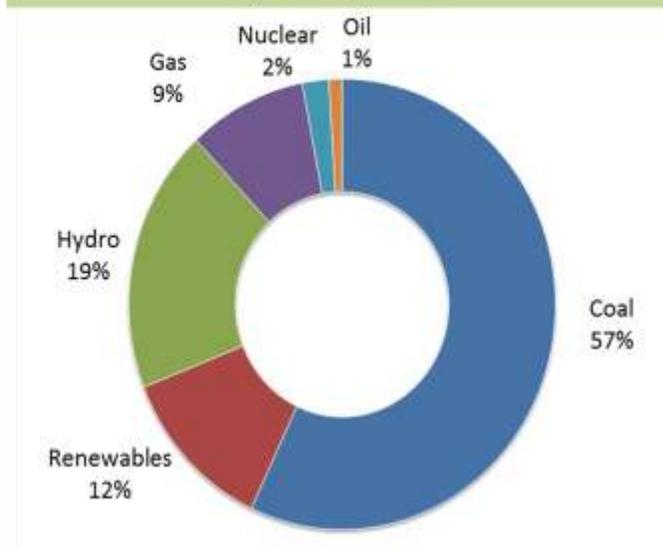
As on 31st August 2012, although the installed capacity of the country reached 207,006MW, energy deficit of over 10 to 12% continued. The peaking shortages also rose to 11% plus during this period thereby showing an increasing trend.

As per estimates of the Working Group on Power for the 12th Five Year Plan (2012-17), India needs to add another 169,815 MW of capacity in the next decade to support the desired GDP growth of 9% a year. This can be achieved only through large capacity power projects.

While the Government is seeking to increase generation of electricity from renewable sources, India continues to rely on thermal sources to meet the growing demand. Of India's current generation capacity, more than 66% is from thermal power plants. Approximately 85% of this (about 57%) is coal-based. Hydro power accounts for about 19% of capacity, while the remainder comes from nuclear power, wind and other renewable sources of energy.

There is an urgent need in India to add significant generation capacity in a short time frame. At this stage, only large power projects can rapidly respond to this growing demand for electricity.

Break-up of Electricity Generation Capacity by Fuel Sources



India has made good progress in adding wind-based capacity using reform initiatives that promote renewable sources and provide tax advantages for the private sector. However, wind power has limited availability as well as high cost, which makes it unsuitable to meet large-scale base load demand.

Gas-based power can be an alternative but availability of gas in India is insufficient even to operate the present installed capacity at reasonable load factor, thus making it unviable for meeting large scale demands. The cost of gas based power is also high.

While the Company has ambitious growth plans, it is committed to 'responsible growth'.

- *Focus on producing clean and green power*
- *Invest and implement eco-friendly technologies*
- *Focus on reduction of Company's carbon footprint*
- *Participation in global initiatives to combat climate change*
- *Scouting for clean power sources internationally*
- *Driving energy conservation and efficiency*
- *Creating sustainable livelihood for communities*
- *Green buildings and villages*

The Company continues to carry forward its green legacy.

The renewable source of solar energy is another alternative but due to its high cost, its commercial sustainability is doubtful despite subsidies from Government.

Large scale hydro projects can be one more option which calls for policy framework and political will to be fast tracked.

Under the circumstances, the fuel mix of India's generation capacity is expected to remain nearly the same in coming years – meaning thereby that the country will continue to depend heavily on coal – based generation. It would, therefore, be important to make the right choices in selection of technologies that would enable the plants to operate in energy efficient and environment friendly manner.

Tata Power's Energy Vision

Tata Power is India's largest integrated power company with an installed generating capacity of about 6899 MW and a presence across the entire value chain in the power sector viz (thermal,

hydro, solar, wind and geothermal) generation, transmission, trading, distribution, fuel and logistics. For more than nine decades, Tata Power has been guided by the **founder Shri Jamsheji Tata's vision** of **“Clean and affordable power”** for the country.

In line with its vision **“To be the most admired and responsible Integrated Power Company with international footprint, delivering sustainable value to all stakeholders”**, the company plans to build a healthy pipeline of upcoming projects targeting a generation capacity of 26,000 MW by 2020 out of which 20% will be from renewable sources.

The Company is one of the leading renewable energy players in India with robust portfolio of 22% generation from clean energy sources. Tata Power's current clean energy portfolio comprises of 28+ MW of solar plants, 375 MW of wind capacity and 447 MW of hydro projects. Its solar projects include a 3 MW, Photovoltaic (PV) based grid connected solar plant at Mulshi in the Western Ghats, a 25 MW Solar PV Power Project at Mithapur in Gujarat and a 60.48 kWp Solar Power Plant installed on the rooftop of its office at Carnac Bunder in Mumbai. Its wind capacity of 375 MW is spread across 4 states of Tamil Nadu, Karnataka, Maharashtra and Gujarat.

Tata Power has partnered with the Australian company – Sunergy Pty. Ltd. to build the first floating solar plant in India. As part of its international growth profile, the Company is developing a 240 MW geothermal plant in Indonesia along with Origin Energy, Australia and PT Supraco, Indonesia. Additionally, the Company has a Joint Venture (JV) with Exxaro Resources to focus on electricity generation projects in South Africa, Botswana and Namibia. This JV, company called Cennergi has won the bid for two wind energy projects of 234 MW in South Africa. Two international hydro energy projects are also under development. This includes a 114 MW Dagachhu Hydro Project with Royal Government of Bhutan and the 600 MW Tamakoshi-3 in Nepal with SN Power.

Further, the Company is in the process of evaluating different business models for **“distributed power generation”** and supply to rural areas in India.

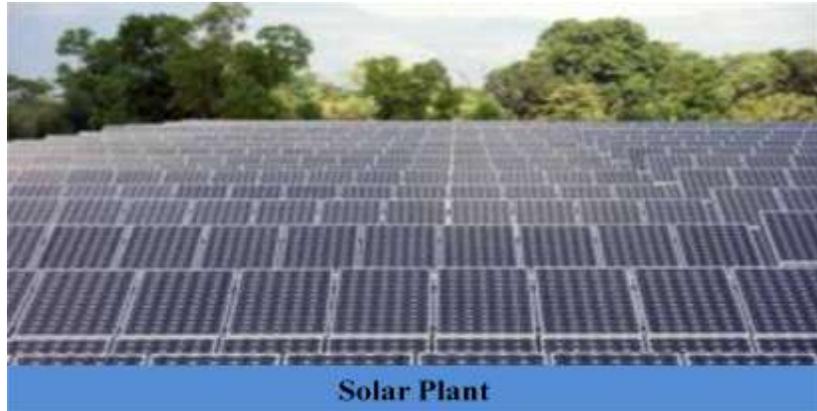
The Company is conscious of its role as a sustainability steward and embraces the challenges of climate change. Tata Power's initiatives for mitigation of climate change comprise investments in clean coal technologies; several well-planned projects that generate power from wind,

Tata Power Club Enerji

“Sensitizing the citizens of tomorrow.”

A unique and well received initiative, Tata Power Club Energy has reached out to more than 285 schools nationwide (Mumbai, Delhi, Kolkata, Pune, Ahmedabad, Bengaluru, Lonavla, Jamshedpur, Belgaum), sensitized over 1.5 Million citizens and saved more than 2.8 MUs of energy in 2011 alone. The Club has a strong, sustainable and replicable model to spearhead a movement.

solar, and geothermal energies that are renewable sources; an unflinching commitment towards biodiversity conservation; optimizing water use; and creating green belt by planting of trees around the power plants to reduce the carbon footprint.



Eco-friendly Technologies and Processes

Tata Power is working on the development and implementation of advanced eco-friendly technologies and processes for energy management.

It is working with policymakers and regulators to advance technology, strengthen the renewable energy portfolio, accelerate the development of cost-effective energy efficiency programmes and manage consumers' demand for electricity. The Company has also tied up with various organisations engaged in cutting-edge research in the renewable space and is piloting projects based on geothermal energy, solar concentrators, biomass gasification, amongst others - all with a view to bring these to commercial operation and scale in the medium term.



The Company is also an active advocate of more efficient and superior Under Ground (UG) technology coal mining.

Research and Development in Clean Technology

Tata Power is a member of the Cleantech Forum, which helps it to keep abreast with the Research and Development (R&D) updates on clean technologies. Different technologies in a variety of areas like CO₂ absorption using algae, carbon capture storage and reuse, fuel cell usage in telecom tower application; gasification (biomass, coal), solar (PV, thin-film and

concentrated thermal), and micro-turbine wind energy generation etc. are currently being evaluated. Some of the initiatives include:

- **Solar Concentrated Thermal** – The Company is working on two different technologies – a 1 MW unit in association with the Indian Institute of Technology (IIT) Bombay and a 500 kW unit with ICT and Tata Steel.
- **Microwave applications in drying of coal** – In order to reduce losses in efficiency due to high moisture content in coal used in coal fired power plants and investigate the possibility of drying of coal using microwave technology, preliminary studies along with experiments have been carried out. The success of the study will pave the way for establishing future capacity.
- **CO2 capturing using algae** – The Company is exploring options of capturing the CO2 generated from its thermal power stations using algae. This will essentially reduce the amount of CO2 generated from the plant while assuring sustainable utilization of CO2.

Its solar initiative is further supported through **Tata Power Solar Systems Limited (TPSSL)**, a subsidiary of the Company, which manufactures high quality, low-cost crystalline silicon cells (both mono and multi crystalline) and solar modules used to generate electricity from sunlight. TPSSL cells and modules are integrated into solar products such as home lighting systems, street lights, and telecommunication towers or connected to the electricity grid.

The Ultra Mega Power Projects (UMPP) Scheme

In line with objective of “Power to all by 2012”, the Government of India took up the ambitious programme of UMPPs in 2005. Each project with an installed capacity of 4000 MW was envisaged with the intent to make power available at minimum cost through economies of scale and superior energy efficient and environment friendly technology.

The development of these UMPPs in the Public Private Partnership (PPP) model was undertaken on competitive tariff based bidding, in which Special Purpose Vehicles (SPVs) were set up by the Power Finance Corporation (PFC), which was appointed by the Government of India as nodal agency for developing the UMPPs.

The SPVs were responsible for all initial development work including obtaining required land, environmental and other clearances for the project even before handing over to the developers after the bidding exercise. So far, 16 UMPPs have been planned in various states including Andhra Pradesh, Chhattisgarh, Gujarat, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Orissa and Tamil Nadu.

UMPP Facts

- Estimated investment in each UMPP: approximately Rs.16,000 to 20,000 Crores
- Assigned through competitive bidding process
- Developed on a build, own and operate (BOO) basis

- Government’s responsibility: Provide land, water, coal blocks, environmental clearances and tie-up for power sale
- Private developer’s responsibility: Arrange funding, technological tie-ups, place orders for key equipment, execute and operate the project
- Based on “supercritical technology” to achieve higher efficiency levels
- The Ministry of Power (MoP), in consultation with the states, identified 16 UMPPs since 2005, out of which 4 have been bid and the rest are in various stages of planning:
 - Coastal Gujarat Power Limited at Mundra is the first UMPP to go live. It was awarded to Tata Power in 2006
 - Three other UMPPs – Sasan, Krishnapatnam and Tilaiya were awarded to Reliance Power.

The UMPP scheme has a number of policy innovations driven by the Government of India’s desire to meet the rapidly growing economy’s needs. However, all the awarded UMPPs (Refer Table-1) and other projects are grappling with a number of challenges starting from land acquisition, mine-related clearances, shortage of domestic coal supply and unprecedented increase in prices of imported coal.

UMPP	Winner	Date of LoI	Fuel	Levelised Tariff	Start Date	Status
Mundra	Tata Power	28-Dec-2006	Imported Coal	Rs.2.26/kwh	Mar-2012	# 800 MW Unit 1 commissioned in March 2012 # 800 MW Unit 2 commissioned in July 2012 # Work on Units 3, 4 & 5 is in progress
Sasan	Reliance Power	1-Aug-2007	Pithead Coal	Rs.1.29/kwh	Jan-2013	Construction in progress
Krishnapatnam	Reliance Power	29-Jan-2008	Imported Coal	Rs.2.33/kwh	Jan-2013	Construction Stopped
Tilaiya	Reliance Power	Aug-2009	Pithead Coal	Rs.1.77/kwh	May-2015	Clearance being obtained; construction yet to commence

Levelised tariff is the tariff arrived by discounting the tariff of 25 years as calculated by bidders using assumptions of their choice, as well as, the same given by the Government in the bidding documents. This is only a tariff to evaluate the various bids and decide a winner. Actual tariff will differ based on actual escalation of various tariff components at any point of time.

4000 MW Mundra UMPP – A Source of Clean and Abundant Power

Coastal Gujarat Power Limited (CGPL), Tata Power's wholly-owned subsidiary, is implementing the 4,000 MW (800 MW x 5 Units) UMPP near the port city of Mundra in the State of Gujarat in India. Mundra UMPP has established India's first 800 MW units based on supercritical technology and is arguably the most energy-efficient, coal-based thermal power plant in the country, today.



Mundra UMPP plant view

The project will supply power to 5 States, namely Gujarat and Maharashtra in Western India and Haryana, Rajasthan and Punjab in Northern India, which currently are facing severe shortage of electricity. It will provide a competitive source of power and help meet these states growing demand for electricity.

Reliable power from the project will help improve the competitiveness of manufacturing and services industries, which often rely on expensive alternative of diesel generation to meet their power interruption to keep the production going. Competitively priced power will also improve access to electricity in rural and urban areas, while reducing the subsidy burden on State Governments. The first two units of 800 MW size each have already been commissioned and Unit 3 has been synchronized. The remaining units will be commissioned at subsequent intervals of 4 to 6 months each.



*CGPL adopted
superior
supercritical
technology
from Japan for
enhanced
efficiency*

Mundra UMPP Highlights

- *India's first 4000 MW private power project near Mundra Port, Kutch District of Gujarat*
- *India's first 800 MW unit thermal power plant using supercritical technology*
- *Main power generation equipment sourced from Korea and Japan*
- *Creation of 5000 construction jobs and 700 operations oriented jobs*
- *Most energy efficient plant in India with lower Green House Gas (GHS) emissions vis-à-vis existing plants*
- *Once complete, the Mundra project will meet 2% of India's power needs*
- *Consumers in five of India's power starved States will benefit from this project*

The project has won few awards

- Asia – Pacific Power Deal of the Year awarded by PFI in 2008 for its financing achievement in a span of 12 months in power sector.
- Infrastructure Excellence Award 2012 in the Energy and Power category for the execution of Mundra UMPP.



From the Visitors Book

"Excellent work. Safety first is the watchword. Advancing of commercial operation date of 2 units is really welcome. The project team is looking at doing the same with unit 3 also. My best wishes and compliments for excellent work.

Shri P. Uma Shankar, Secretary,
Ministry of Power, Government of India

International Coal Prices – A Challenge for Mundra UMPP

Over the past four decades the international coal market has been range bound and stable in terms of price and availability. Internationally, coal commitments are typically for short term, less than 5 years for supply and less than 1 year for price. Suitable sources for India's requirements include countries like Indonesia, Australia, and South Africa. However, over time, Indonesia has emerged as the preferred choice for Indian developers, with almost 50% of tie-up being from Indonesia due to advantages in logistics and mining costs.

On 23rd September, 2010, the Ministry of Energy and Mineral Resources of Indonesia issued Regulation No.17/2010 on Guidelines on the Determination of the Reference Price of Mineral and Coal Sales. This regulation provides that mineral and coal producers are obliged to sell minerals and coal based on a regulated benchmark price, whether for domestic or export sales.

The benchmark pricing obligation applies to all minerals and coal sales to third parties, including any affiliate of the mineral and coal producer (which includes any party that has direct ownership in the holder of a Production Operation International Usability Partners or a Production Operation IUPK as well as any party that may indirectly influence the decision making of such holders).

All existing supply contracts (both spot and term contracts) with Indonesian mining firms were required to be brought in line with this new benchmark regulation by 22nd September, 2011. Spot sale contracts were required to be adjusted by not later than 6 months after the effective date of Regulation No. 17 (that is, by 22nd March, 2011). Long term sales contracts were required to be adjusted by not later than 12 months after the effective date of Regulation No. 17 (that is, by 22nd September, 2011).

Indonesia is also considering imposition of export duty on coal and minerals and further restrictions on low-grade coal exports in the future. South Africa is also considering restrictions on coal export to preserve coal for domestic use. Australia has imposed a green tax on coal exports in the process boosting international coal prices.

Ironically, India's need for coal to fire its growing thermal power sector has also driven up coal prices in Australia and Indonesia, the principal sources of imported coal for the country. The demand from China has further added to the impact on the global prices.

These changes have made the coal market highly volatile.

Tata Power for Mundra UMPP had contracted coal from Indonesia on terms that were reflected in bid tariffs. Tata Power tied up the coal for its various projects including Mundra from the Indonesian mines. This contract was at a steep discount to the prevailing market prices. Tata Power also made shipping arrangements by entering into long term contracts. The new regulations have rendered the current contract invalid, thereby severely impacting the purchase cost of coal for Mundra.

Due to above mentioned unforeseen circumstances; there has been an unprecedented rise in imported coal prices to the range of 150 - 200% from the start of the bid process.

How has Mundra UMPP been impacted?

CGPL had signed PPAs with 5 states in April 2007 — Gujarat, Maharashtra, Punjab, Haryana and Rajasthan — before the Indonesian government made coal price change, thereby making tariff based prices of the PPAs unviable. Thus, it has become necessary to review the PPAs.

When the bidding process for the UMPPs was on, expert consultants had advised the CERC of various options for indexing coal price (as well as transport cost) increases. The CERC arrived at an annual cost escalation of 3.46% in coal prices based on 12 years' average price trends indicated by an expert study.



Mundra UMPP tariff consists of 55% non-escalable and 45% escalable fuel cost. Bidding for the UMPP was done with financial calculations based on the CERC – prescribed increased in coal cost per annum (3.46% per annum). This would have amounted to 17% increase between 2007 and 2011. Even at an assumed escalation rate of twice that was allowed (7%), the benchmark price of coal would have increased to \$69 in 5 years. But the actual increase in coal prices turned out to be around 150% to \$120 from \$50 at the time of bid.

The Mundra UMPP is the only UMPP to have progressed as per schedule in all activities. The first 800 MW Unit was commissioned in March 2012. The second 800 MW Unit was commissioned in July 2012 and the third unit was synchronized in October 2012.

It is against this background that the existing and prospective power developers have requested the Central as well as the State Governments of the procuring states to look into the issues of imported fuels and resolve the issue by review of the PPAs to ensure viability of the project. While the policy aims to ensure lower power tariffs, it needs to be kept in mind that there are factors beyond the developers control impacting the tariff.

It must be borne in mind that the concept of UMPPs is fundamentally a flagship scheme of the Ministry of Power, Government of India, to promote (PPP) under which the government conceptualizes and carries out the pre-developmental activities and the private sector brings in the finances and managerial capabilities to realize the aspirations of the country. Since the coal price paradigm has changed due to factors beyond the control or influence of the project developers, it would be a normal expectation that Government of India / States intervene to restore the long-term viability of such projects. If intervention at the level of international coal markets is not feasible due to a variety of factors, these could be internally focused and effected through appropriate policies and directions to make a sound business case for the private developers.

In the above context, CGPL has filed a petition with the CERC seeking intervention to establish an appropriate mechanism to offset in tariff the adverse impact of the unforeseen, uncontrollable and unprecedented escalation in the imported coal price impacted greatly by the change in law by the Government of Indonesia

CERC-predicted increase in coal cost at 3.4 per cent per annum; this would have amounted to 17 per cent between 2007 and 2011. But the actual increase in coal prices is around 150% to \$120 from \$50 at the time of bid.

The Commission has heard the petition and suggested that the concerned parties i.e. procurers and CGPL should meet immediately in order to explore the possibility of finding a specific solution. The Commission has kept the petition pending and has asked the parties to report on the outcome for it to decide on further course of action. CGPL is committed to pursuing this advice and hopes to find an early resolution.

Even after requested tariff revisions, UMPPs to remain competitive sources of energy

To make an assessment of the tariff at which the state distribution utilities are procuring electricity from various generation units, we undertook an analysis of rate of sale of power by various generation units in the F.Y. 2009-10 based on data from CEA. The following table presents the distribution of installed capacity across three ranges of rate of sale of power from the coal based thermal power generation utilities which constituted around 55% of the total installed capacity of 1,35,049 MW from the 357 units

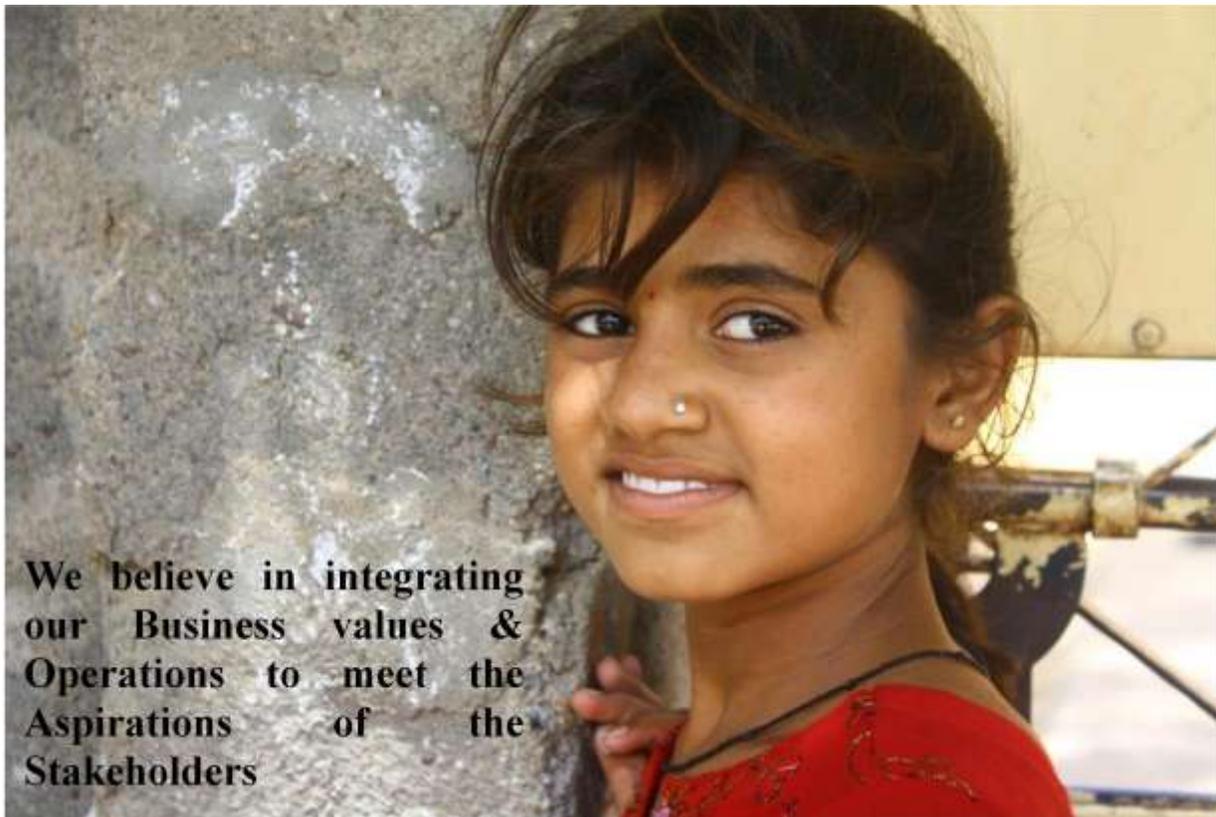
Rate of Sale	Installed Capacity	% of total thermal coal capacity
Rs.1.00 -Rs.2.00	13172 MW	27
Rs.2.00 -Rs.3.00	11815.5 MW	23
Rs.3.00 -Rs.6.00	24766.3 MW	50

The review indicated more than 50% of electricity sold by coal based thermal power stations was above Rs.3.00. The analysis shows that the projects that sold electricity at price below Rs.3.00 per unit are projects with captive coal blocks, with linkage, pithead coal and are fully depreciated units.

If we look at information from CEA, the weighted average rate of sale of power from generating stations of different sources of Power Utilities for the F.Y. 2010-11 is given below:-

Sources	Weighted Average Rate in Paise / kWh
Hydro	211.57
Thermal	305.41
Nuclear	248.78

In the emerging scenario, with shortage of domestic coal worsening and share of imported coal going up, most of electricity sold to distribution companies is going to be priced above Rs.3.00 per unit. This analysis shows, going by the current trend of electricity prices in the country, even after allowing moderate increase in tariffs to compensate for the unforeseen rise in fuel prices, power from the project under discussion would remain competitive over major chunk of energy to be generated



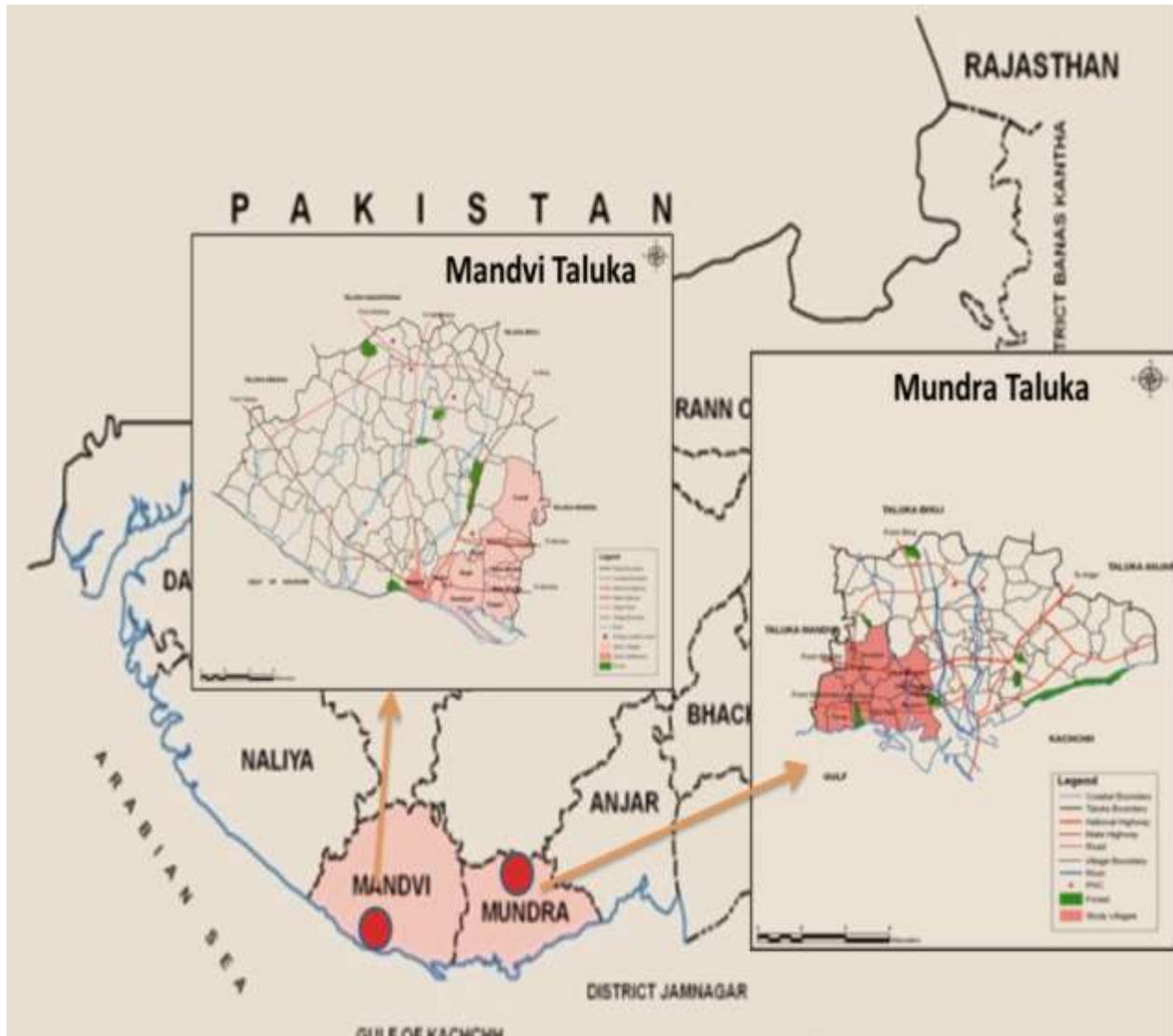
“No success or achievement in material terms is worthwhile unless it serves the needs or interests of the country and its people and is achieved by fair and honest means”

*J.R.D. Tata
Bharat Ratna*

The major challenge that the team faced was hesitation of the community to interact, mitigation of loss of grazing land, agreement on land rates, land title issues within the families, shifting priorities of the community and issue of livelihood restoration for impacted families in particular and community in general.

CGPL project influence zone of 10 km radius consists of Mandvi Taluka cluster and Mundra Taluka, which comprises approximately 10 villages each.

Villages in Mandvi Taluka include Bag, Bidada, Faradi, Gundiyali, Maska, Mota Bhadiya, Nana Bhadiya, Nani Khakkar, Pipari and Tragadi. The villages in Mundra Taluka include Deshalpur, Jarpara, Kandagara Mota, Khakhar Moti, Moti Bhujpar, Nani Bhujpar, Navinal, Pratappar, Shiracha and Tunda.



Estimated population of the area was 80,000 in 2011. As per the “socio-economic assessment” done in 2007, major sources of livelihood in the villages are plantations (‘kharik’, ‘chikoo’ and coconut), cattle (milk production), agriculture (mainly summer crop, if there is rain), fishing and other occupations like trade, transport and services. Many families from these villages also work in towns like Ahmedabad, Vadodara, Surat and Mumbai. There are a few migratory fishermen as well. Concerted efforts were taken to establish a participatory approach to acquire land and mitigate the issues of grazing land.

Extensive research was conducted in the region to assess the need of the residence and proper execution plan was firmed-up to address them.

Community participation is a critical success factor for any community development effort and building on this, CGPL’s community relations team started with the following community development initiatives at the beginning of the project.

- A series of consultative dialogues were held with village elected representatives, opinion leaders and the community.
- Issue based Participatory Rural Appraisal (PRA) and Micro Level Planning (MLP) with the assistance of recognized agency in the field of social development – through the involvement of the community and opinion leaders was undertaken so that the plan may come directly from the community, the bottom up paradigm approach.
- ‘Triple Bottom Line Approach’ of sustainable development was followed that has helped in achieving a satisfied community demonstrating trust and faith in the company and its operations.



CGPL meeting with villagers in progress



Community survey in progress

A detailed document outlining the four years journey of community development and engagement activities undertaken by CGPL is attached as Annexure-I for reference.

A systematic strategy has been followed for the identification and grouping of stakeholders based on their influence, leading to a phased stakeholder dialogues.

It includes exploring and engaging, building and formalizing, implementing actions and then continuously evaluating in a manner that institutionalizes relationship with communities. The programme and their outcomes are aligned to achieve high level of impact and sustenance

Today, the above strategy has taken the Company to a journey that spans the 8 themes i.e. education, health, drinking water, employability / income generation and livelihood, biodiversity and environment, rural infrastructure development, community organization and institution building and rural energy.

Some of CGPL’s noticeable efforts include ‘Project Sujaan’ which has led to overall improvement in academic performance among the children, grazing land mitigation by providing fodder for (3000) cattle in villages. It was applauded by the national and state authorities. Self Help Group (SHG) initiative providing support to 227 women of the villages by initiating micro-

finance activity and health management comprising of prevention of blindness programme by reaching out to 244 people. CGPL with the assistance of grass root NGO also implemented project ‘Uttkarsh’ – a holistic community development programme catering to the needs of the community through their active participation. “Uttkarsh” is giving impetus to safe drinking water by installing RO plants, rural energy and water management by construction of check dams, creation of Adarsh Agwanwadi, and establishment of milk collection centers, activities related to farming and drip irrigation and many more.

Eight Thematic areas of intervention			
Income Generation and Livelihood	Rural Infrastructure Development	Drinking Water	Education
<ul style="list-style-type: none"> Addressing loss of grazing land through Gaushala Market linked Shelf Help Groups (SHG) Milk Collection Centre Skill Development Training for Rural Youth Distribution of Fishing Nets, Fiber Boats to Fishermen Community based retail enterprise (CBRE) Promotion of local artisans by sponsoring handicraft fair 	<ul style="list-style-type: none"> Rural civic infrastructure construction of village gates, Panchayat Bhavan, Approach Roads, Community Hall, Community Toilet, Village Road Construction of Gaushala Water Preservation (Check Dam, Rain Water Harvesting) and Connectivity Structure Renovation of School Infrastructure Creation of Water Management Infrastructure 	<ul style="list-style-type: none"> Community RO Plants Drinking Water well with pipeline facility Installation of RO Plants in Schools 	<ul style="list-style-type: none"> Project Sujan: Computer Aided Learning Bal Pravetsov: Distribution of Educational Kits Pravesh Utsav: Promoting enrolment of Girl Children in Schools Shiksha Sarathi: Promoting Experience based Education
Community Organization and Institution Building	Safety & Health	Environment & Biodiversity	Rural Energy
<ul style="list-style-type: none"> Community Information Centre Village Development Advisory Committee, Shelf Help Groups, Adolescent Girls Learning Centre Promotion of Lok Dayro 	<ul style="list-style-type: none"> Community Health Camp Arogaya: School Health Programme Strengthening Aganwadi Centre HIV / AIDS Workshop and capacity building programme 	<ul style="list-style-type: none"> Plantation Work Mangrove Cultivation Fish Breeding trials and Commercialization 	<ul style="list-style-type: none"> Household Bio-Gas Solar Street Light Solar Light installation in the boat School Bio-Gas Plant Street Lights

In the following sections, extensive community engagement activities undertaken by CGPL under these identified thematic areas have been outlined.

Theme 1: Income Generation and Livelihood



During the initial days of the project (2007-08), a survey was conducted to understand the employment and livelihood pattern in the area around the plant. This survey revealed that younger members of about 152 families had migrated to neighboring districts and Mumbai for business, jobs and higher studies. Out of these 152 households, permanent migration has been recorded in case of 117 households. This was happening because of the non-availability of employment/business opportunities in the area. During the survey following issues also emerged:

- Lack of higher study opportunities for youth
- Grazing land lost because of the area covered by CGPL plant
- Serious hygienic issues in villages
- Lack of skilled manpower that is the key requirement for industries among local population.
- Women were not able to use their abilities for income generation.

Our intervention

A win-win solution can only develop sustainable harmony and a long-lasting bond between Communities and the Industries. When CGPL came into existence in this region, it spearheaded the developmental path for the area. With clear cut vision and philosophy the team started engaging with the community and strategizing in respect of their needs. The company decided to tackle the employability issue as one of its social agenda.

In order to address the matter, CGPL took firm decision of initiating Livelihood Development Program in the project affected villages. Before launching of the program the team also did the Employability Potential Assessment (EPA) of the region covering neighbouring industries, restaurants, govt. offices, non govt. agencies, small scale business units and local grocery stores etc. The aim of this assessment study was to extract socio economic information for enhancing livelihood opportunities. EPA also focused on:

- Identifying potential trades for rural youth
- Spotting the most deserving candidates for employability training
- Identifying skill sets in demand in the existing market
- Identifying potential employers, service providers, collaborators etc.

Livelihood approach

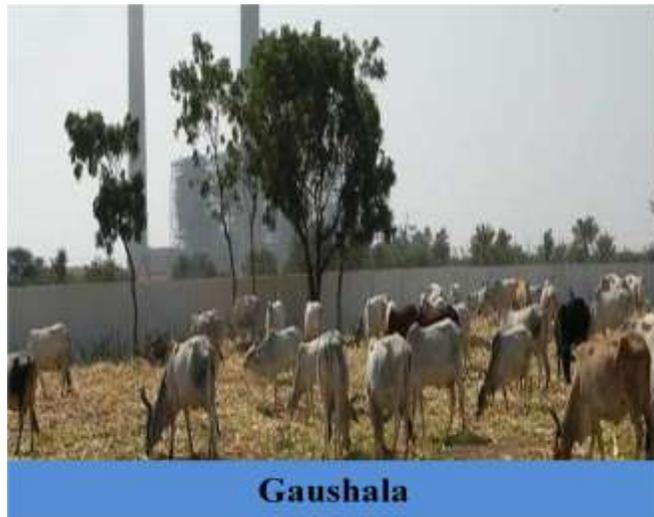
Following the Gandhian philosophy of making communities self-reliant, CGPL has introduced a host of income generation initiatives among the communities in the project influenced area. Few of the initiatives are as follows:

Gaushala - Addressing the Loss of Grazing Land

Gaushala is a program targeted for mitigation of the possible loss of grazing land around the project area. Under this initiative, CGPL has established fodder supply centers and built *gaushalas* in two *panchayats* of Mundra. One of the *gaushala* is spread across 13 acres of the Company's land with two fodder storage sheds, five cattle sheds and cattle troughs & the other is being operated in village area. The initiative started with 2100 number of cattle and now it has reached up to 3000 number. This program has set up new benchmarks in the region, as well as, in the State of Gujarat.

Quantifiable benefits because of this initiative are as follows:

- **The cattle census has increased in the area. In 2007-08 it was 664 at one Gaushala and now it has reached 1250. In second gaushala, census was 1436 in 2007-08 & now it is 1750**
- **Average milk production is now 4 litres per cattle which was about 3.25 litres in the past. This has improved because of the stall feeding provided at Gaushala.**



- **Most of the milk is sold in CGPL labour colony, Adani colony and nearby local areas. New market is also available nearby which was not there earlier.**

"It is the result of participatory meeting with CGPL team and also by the involvement of Government officials. The main purpose was to maintain the traditional occupation of the inhabitants of the vicinity. The Company has constructed the gaushala by extending their own land of 13 hectares, which is having all the facilities for cattle survival viz. drinking water, fodder storage and fodder supply, that too free of cost. For better management and creation of ownership, the Company has formed trust comprising community members which is a very welcome step. This model is unique across the State and is a successful venture for restoration of livelihood for the cattle owners. By these initiatives, the relation between the Company and villagers has also been strengthened."

Mr. Asha Bhai Rama Bhai Rabari, 45 years old, Dy. Sarpanch Tunda-Vandh panchayat

"CGPL has also invested in improving grazing lands in these areas, which has made the milk yield of the cattle higher thereby, increasing the income of the villagers. Their efforts to enhance livelihoods in traditional occupations have been a great boon in surrounding areas. They have undertaken interventions in various other thematic areas for holistic development of their neighbouring communities. I am certain that through its sustained and focused CR initiatives, CGPL will add significantly to the momentum of growth and development in Mundra."

Mr. Panneervel (IAS), Principal Secretary, Labour and Employment Department, Government of Gujarat; & Director General, Mahatma Gandhi Labour Institute

Project Utkarsh - Mitigation of impact on livelihood of fishermen communities of Tragadi village

As Tragadi is a coastal village where the salt content in the soil is very high, thus farming is unproductive here. Because of this most of the villagers have opted for cattle rearing. But the cost of rearing livestock was very high and returns from sale of milk were low. The search for a solution to this problem led to the initiation of Project Utkarsh by CGPL. Utkarsh started work on arriving at a solution for optimizing returns to the villagers. A group of 34 cattle-rearers was formed with the aim of providing information on livestock.

Milk collection centers were also started in collaboration with the local Sarhad Dairy. An assistance of Rs 15,000 was provided for necessary infrastructure and resources. Within two months of the initiation of the project, Utkarsh achieved wide acceptance among the people and total revenue of Rs 0.357 million was generated against a collection of 14,755 litres of milk that was sold at a price of Rs. 24 per litre, which was a



Milk collection center at Tragadi village

significant increase from the earlier price of Rs. 12-14 per litre.



Project Utkarsh also encouraged the installation of RO plants for safe drinking water. Water management is done through check dams. Utkarsh has also set up Adarsh Anganwadi which is providing nutrition kits to children. Utkarsh is jointly promoted by CGPL through the Tata Power Community Development Trust and VRTI, Mandvi.

Mitigation of Impact on Livelihood of Fishermen

CGPL has undertaken several initiatives for the fishermen community residing around the areas of influence of the project. The Village Development Advisory Committee (VDAC) has been setup by the Company to ensure community ownership and participation in planning and execution of development work in the villages. In addition, various initiatives under Project Utkarsh are aimed at enhancing income generation amongst the fishermen community. 'Sagarbandhu' is another upcoming initiative aimed at improving livelihood of the fishermen community. The Company has initiated a study on fish breeding through Central Marine Fisheries Research Institute (CMFRI) to get a better understanding of fish breeding to setup ponds for the fishermen community of Tragadi village.

Tragadi Village: Based on the advice of the village 'Panchayat', CGPL provided livelihood grant to 162 fishermen who use the Tragadi Bunder. In addition, Project Utkarsh has also been rolled out in the village.

Tragadi Bunder: The Company has provided a regular supply of drinking water to the fisher men community that camps in the Bunder for 8-9 months in a year. A Company water tanker and water tanks with freshwater have been installed in the Bunder for this purpose. Routine medical camps are also provided at the Bunder during the fishing months. The Company also provided transport assistance to the fishermen during their to and fro migration from the Bunder.

Modhva: A Village Development and Advisory Committee was setup with members from the community and participation of the Company. A future road map for joint activity has been drafted and issues that need to be resolved have been identified. Fiber glass boats and fishing nets have been provided to select fishermen in the village to help them break the debt trap. A fish breeding pond has also been developed in the hamlet for the benefit of the community.

Kalaraksha-Promotion of Local Artisans

Kalaraksha Trust, a grass root level social enterprise, is dedicated to preserving traditional art forms in the area by training and promoting local artisans. At the end of one year training program, exhibition and fair are organized for the artisans of Kalaraksha which are sponsored by CGPL. The aim of the fair is to increase awareness about design principles and give artisans more product options, thereby making the output market-oriented. A few artisans have received national and international recognition with the help of these fairs and exhibitions.

“The fair promotes local artisans. The criteria for enrollment in the programme are that the student should be from the region and he/she should be a traditional artisan. Through this intervention, the artisans have enhanced their skills and competencies related to the craft and deal with the market place much more confidently. Women are now aware and have become vocal and this program has provided an outlet for their creativity. Sponsorship support is provided to local artisans, teachers and students are sent to International fairs in all over the world. This is thanks to the support extended by CGPL in preserving the local art and furthering our mission. CGPL has always been a great support in our mission and interventions.”

Lakhabhai Rabari, Kalaraksha, Vandh village

Contract Opportunities

Presently CGPL is offering small contracts and jobs to the locals through their Community Information Centre by regularly displaying the available opportunities in local dialect. With this approach, till date CGPL has offered local contracts like manpower supply, housekeeping, horticulture works, vehicle supply etc. to approximately 40 people amounting to worth Rs. 120 millions. This earning from the company has enhanced the spending capacity of the villagers and has improved their standard of living.

Income Generation through Livelihood Clusters

CGPL has emphasized on skill development training of women through formation of livelihood clusters. These women after the training in embroidery, tie & dye work etc. get linked with the market through VRTI (Vivekanand Research and Training Institute). It is observed that on an average, each woman is getting Rs.1200 per month as additional income.



Training programs

Firemen training as well as heavy equipments' operation training were also provided to selected youths of neighboring communities by CGPL. Presently 6 youths from nearby villages are working with CGPL after successful completion of their training at Sanand institute of fire technology which was sponsored by CGPL & 3 youths are working with other industries of the region who were trained in operating heavy equipments.

Personality Development

CGPL also focuses on personality development as well as English speaking abilities of youth of neighboring areas. Till date we have covered more than 150 children and youths under the program. Along with this, knowledge sessions are also organized in schools with the help of NGOs.



School children during Knowledge session

Tea Cabins and Shops

CGPL has also allocated shops and tea cabins inside the plant premises to the local inhabitants. Through these cabins, their income has gone up considerably.

Adolescent Girl Learning Centre

A skill development centre has been established by CGPL, where 20 adolescents were given training on the life skills. This training has boosted the confidence of the adolescents and now they are also engaged in the stitching work along with their family members, which can also become a source of income generation for the whole family.

Highlights of impact in numbers:

3000 Cattle covered under fodder distribution through gaushals (animal shelters), benefiting 409 families

925 Animals benefited through vaccination camps

325 Women benefited through self help groups, training, linkage with banks & govt. schemes

317 Fishermen benefited through fishing net distribution

196 Villagers benefited through direct/indirect employment

122 Families benefited through dairy initiative

85 Women artisans benefited through exhibitions organized by Kalaraksha

75 Women benefited through tie & dye, embroidery training

Currently all the above programs are going on for the communities and CGPL is continuously working on the subject by completely involving the communities through regular dialogues. In future also, CGPL has planned to start many new programs to make the communities self-sustainable. Few of the programs like registration with FCRA (for fodder supply trust), vocational trainings, more contracts to locals etc. are already on the cards & will be on track in coming months.

Theme 2: Rural Infrastructure Development

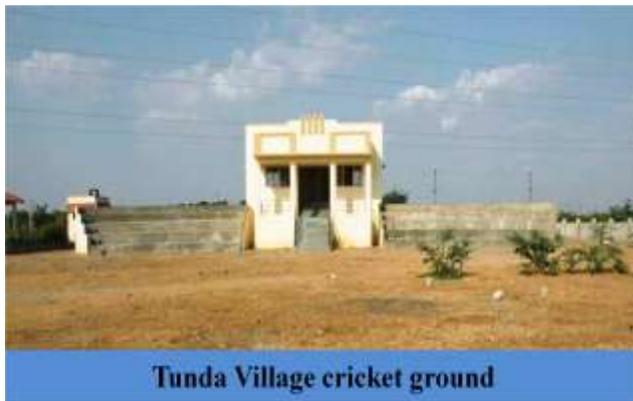


The importance of basic infrastructure in the lives of people is often underestimated. Investment in the development of roads, schools, hospitals, sanitation units, community spaces and information technology support is essential for the economic development of communities. Recognizing the crucial role of infrastructural development in improving the quality of life, CGPL has made significant progress in its initiatives to build physical infrastructure and has invested in public spaces to develop community areas.

Development of Village Civic Amenities

CGPL works with communities to build repair and renovate community infrastructure. This includes community halls for villages, classrooms, boundary walls and sanitation units for schools, children's parks, cricket ground & stadium, roads, animal husbandry sheds and boundary walls for cremation grounds.

Hundreds of toilets have been built in the villages to improve sanitation facilities. Today, a few villages have even achieved 100 per cent individual sanitation units, an achievement that has been recognised and appreciated by representatives of the state government. This programme has led to an overall improvement in sanitation in the region.



By investing in a state-of-the-art cricket ground and stadium close to its project boundary, CGPL is providing the local youth with an opportunity to nurture their cricketing and other sporting talents. A children's park is also being developed alongside the cricket ground.

"This ground is the 2nd biggest in Kutch. I am a part of the sports committee and we plan to hold regional level sporting competitions. Such competitions will increase interactions between different villages in the region and further the brotherhood of Kutch. It will make our village an important area for sporting activities and development in the region,"

Digvijay Zala, 26 years old, Tunda Village, Panchvati Businessman and youth Leader

Project Nirman

By creating various need-based community infrastructures, CGPL continually strives to improve the quality of life in its neighbouring communities. Following a recent request made by the Village Development Committee of Vandh village, CGPL is facilitating the construction of a 500-meter road to the village.



CGPL has engaged a local service agency for the construction of this road. In addition to providing the villagers with easy transportation, the road has also mitigated water-logging in the area. Along with this a community hall is also constructed in Vandh village.

Check Dam Construction

Under Project Utkarsh, CGPL has initiated the construction of a check dam at village Nana Bhadiya. In response to the need expressed by the Panchayat, the request was taken up by CGPL to mitigate water scarcity in the area. The community felt that with the construction of the check dam, the total dissolved solvents (TDS) problem would get minimized.



In addition, the runoff water could be stored and the source of drinking water for the village would be recharged by the check dam. Further, this would also contribute towards minimizing soil erosion. CGPL's implementing partner for Project Utkarsh was the Vivekananda Research and Training Institute (VRTI).

The dam site was identified in consultation with the community and the implementing agency, after which the area was mapped for the exact location. At a community meeting held on this subject, it was decided that a committee would be set-up for the operation and maintenance of the check dam. A bank account, to be operated by this committee, would also be set up to manage funds for the maintenance of the dam. The fund for maintenance would be raised from beneficiaries. This dam would directly benefit 89 farmers

Theme 3: Drinking Water



Drinking water has been the central theme for development in Kutch where annual rainfall is less than 200mm. Traditionally, villages used to govern water resources and manage efficiently for drinking water. However, after independence, when water became *State Subject*, villages turned out to be dependent to state for the supply of drinking water and slowly but steadily the traditional system of management collapsed. Community once owned drinking water sources. Today they are struggling for safe, adequate and equitable drinking water. Off late, government also realized that there is need to build capacities of communities to manage drinking water distribution system.

The coastal region of Kutch suffers from a scarcity of potable water. Not only is there a high incidence of water borne diseases in the region, but there is also an abundance of Total Dissolved Solids (TDS) present in the water of this area leading to health problems like arthritis. In the light of this situation, ensuring safe drinking water to the community is a key initiative of CGPL.

A detailed hydro-geological and hydrological investigation is being undertaken with special reference to water conservation in the villages of Mandvi and Mundra. CGPL has partnered with Through Water Solutions, a Delhi-based organization, and initiated programmes in the areas of watershed management and rainwater harvesting (i.e., well recharge, pond deepening, check dams, farm bunding and others) in the nearby villages of Tunda, Tragadi, Nanabhadia and Mota Kandagra. CGPL has taken several initiatives under the thematic area of water conservation. Few are as below:

- In the year 2010, August CGPL initiated a study through **Water Solutions for investigating the hydro geological and hydrological status** with special reference to the water

conservation in selected villages of Mandvi and Mundra Taluka of Kutch district. The study area focused on 20 villages between Mundra and Mandvi and constitutes number of watersheds from the drainage flowing towards the sea. The perusal of watersheds map of the study area and availability of water as surplus monsoon runoff indicates ample scope and opportunity for harvesting the rain water and its conservation in the study areas.

- **Deepening of Pond:** On the basis of the report, the team started the execution of the findings. The first project executed under the thematic area was deepening of the Pond located at village Tunda. This was one of the oldest structures prevailing in the area and was beneficial to community.
- **Project SwachhJal:** CGPL launched the Swachh Jal Project with the purpose of providing safe and clean drinking water. The Company constructed fresh water wells in the fishing hamlet named Modhva of the Gundiya gram panchayat. The objective was to provide water to 275 households in the village. This initiative was undertaken because the existing sources of water were very far from the hamlet and women had to travel for miles to fetch drinking water. The need for wells was expressed by members of Village Development Committee. Hence, in order to eradicate the scarcity of drinking water, a well was created near the hamlet.

“A few years ago, the problems in Mundra were many. Issues of water scarcity and salinity, ailments like cardiac problems, joint pains, child mortality, lack of education, etc. were widely prevalent. CGPL entered our villages by gaining people’s confidence through community dialogue and participation.

Dams and regular water availability in villages has improved our standard of living. Job opportunities have increased and education is being given more importance. The community halls that CGPL has built have strengthened associations and facilitated meetings for discussions on development issues. CGPL has a great reputation and we have a lot of confidence in their abilities to solve problems.”

Lal Rambhia, Opinion Leader, Nana Bhadiya

The Company invited a geo-hydrologist from the Water and Sanitation Management Organization (WASMO) to identify available water points. The local residents of the village were consulted before finalizing the spots for wells. Initiated by VDAC, the entire process of inviting the quotation and finalizing the service agency for construction was undertaken by the CGPL and the progress of the work was monitored by VDAC members. This has mitigated the water scarcity of the village.



Under its Jalmani programme, CGPL installed 12 1000LPH RO plants in schools of Mandvi taluka in collaboration with WASMO. The plant was setup to resolve issues arising due to the high salinity and TDS in the area. A water management committee was formed to operate and maintain the RO plant in addition to creating awareness on the use of safe drinking water. A helpline number was issued to the school authorities and the water committee so that complaints could be easily registered. An annual maintenance contract had been signed with Panda Water Technology.



“Due to the installation of this RO plant by CGPL, our people will be free from waterborne diseases. The way CGPL had taken up the consultation drive for implementation of this programme involving various stakeholders like village gram panchayat, opinion leaders, self-help groups, technical help from WASMO has shown the Company’s commitment towards the society.”

Mr Kirtibhai, Sarpanch, Tunda-Vandh village

- **Rain Roof Water Structure:** For mitigating the water scarcity, the roof rain water structure has been built in the village Tunda.
- **Drip Irrigation:** A pilot project has also been carried out in the year 11-12 on awareness on Drip irrigation and under this project, 6 farmers were chosen and the drip irrigation facility was extended in 6 hectares of land. The outcome of this was very much appreciated by the community.
- **Well Recharging:** For better water management, well recharging was undertaken in village Motakandagara, Nanabhadiya and Tunda. Through this activity 18 farmers were benefited.

Theme 4: Education



Educational status of the region: As per the 2001 Census, the Mundra Taluka level literacy rate was 63.6% as against the state level rural average of 61.29%. The Mundra Taluka male literacy level was 74.82% vis-à-vis the female literacy of 52.04%.

Need for pre-primary and primary education was very high followed by higher secondary education in the area. The overall need for the education is found to be 90 percent during the interaction with the community. As it has been observed that the children of the region have been long deprived of a constructive learning environment and the drop rate is very high.



Our Intervention

Although, Government through its own established approach has tried to upgrade the educational system in the region through Sarva Shiksha Abiyan, establishing the computer labs in the school, orientation of the teachers through capacity building training etc. but these efforts are still in the nascent stage. Hence CGPL has tried to intervene in the educational domain, so that the literacy of the region may be uplifted, the drop rate can be minimized and the quality teaching can be enhanced through regular teacher's training. CGPL, in line with its philosophy of strengthening the education system in and around its project, has initiated several education projects in the neighboring community. The Company believes that small steps taken in the direction of promotion of education will have a great impact on the future of the younger generation of communities. CGPL continues to mobilize community and resources towards increasing the reach and access to education and has introduced some very innovative concepts in partnership with local government and nonprofit organizations. Keeping in mind the broader objective, CGPL has launched two ambitious projects i.e. Project Sujaan & Project Shiksha Sarathi which are explained below.

Project Sujaan – Redefining Rural Education

Project Sujaan is being implemented by CGPL through an agreement with Hole-in-the-Wall Education (Hiwell), a JV between NIIT and International Finance Corporation, part of the World Bank Group, to set up, operate and monitor the evaluation of learning stations for a period of three years. The project, which was aimed towards formalizing the education system through the added value of computer literacy, has been successful in educating more than 900 students in Mundra.



The project, which was aimed towards formalizing the education system through the added value of computer literacy, has been successful in educating more than 900 students in Mundra. Project Sujaan, through its various collaborative ways, has helped students to familiarize themselves with computers and actively use them. The project set up learning stations in the villages, where they imparted training in innovations in technology, hardware/software design & cognitive skills. Project Sujaan has made a significant contribution to improving elementary education and life skills of children across Mundra.

The project also aimed at community mobilization through interaction, display of video and photographs amongst other such things in order to create a sense of belongingness among

children. Orientation programmes were undertaken to familiarize students with computer usage and trouble-shooting. The children were monitored and evaluated on their achievement levels in computer literacy, English, mathematics and the social sciences.

“Multi Media computers have been installed outside our classrooms in schools. Students can access and use this facility. These were installed a year and a half ago. Through these computers, we get a better understanding of the topic at hand and it gives us more practical knowledge and examples than just reading theory.

Enrollments have also increased in the school since every kid these days wants to learn how to use computers and feels excited to be able to learn on computers. I use computer for translating work from Gujarati to English; extensively use dictionary installed in it to find meanings of new English words I learn in class; I read about the different Gujarati writers and about science projects,”

Hardip Singh, 13 Years, Tunda Village, Beneficiary of Sujaan Project

Pravesh Utsav: Shiksha Saarthi

Project Shiksha Saarthi was initiated in 2009 to enhance educational standards in the region. The initiative encourages parents to get their children admitted into schools.

The ‘Pravesh Utsav’ is an annual event under Shiksha Saarthi, organised by CGPL in association with the Government of Gujarat. It is aimed at increasing the enrolment of children, especially girls in primary schools. The Company provided educational kits to school children from Mundra and Mandvi Taluka under this initiative

In the course of one year, the Company provided around 850 educational kits to new entrants in the schools of Mundra and Mandvi Talukas. While 750 educational kits were distributed in Mandvi Taluka covering 42 schools, 100 educational kits were distributed in three schools of Mundra Taluka. In the previous year, the Company had distributed 640 educational kits to children.



Baseline Assessment during Shiksha Saarthi program



School Kit Distribution at Vandh Hamlet

In a bid to create awareness on environment conservation among students, the Company printed slogans on environment and energy conservation on these kits.

The *Pravesh Utsav* has now become a platform where three institutions i.e. Government, industry and educational institutions have joined hands to enhance educational standards and build a sustainable society.

Educational Trip under the Project Shiksha Sarathi

In order to enhance the educational experience and for arrange varied programmes for all round development of school children, CGPL participates in various ongoing government sponsored programmes. One such programme included a one-day educational visit for 52 school children of the Tunda Primary school. During the visit, the children got the opportunity to visit a site of historical importance, an amusement park, a biscuit factory and other such interesting places. The school teachers who accompanied the children applauded efforts of CGPL in providing extra-curricular exposure. The Company also organized a quiz competition for the children.

“Mundra and Mandvi villages have seen many positive changes with CGPL’s efforts. In the next five years, I see a higher economic growth of the area, nearby land prices will increase and in turn benefit the people. The public spaces and gardens constructed by CGPL have been beneficial to the community and increased mobilization and recreation of people. The launch of the educational learning stations in the name of SUJAAN, have been of great help to us in improving education facilities and enhancing interest in students to attend school. CGPL has also given educational kits to students; this has attracted more student enrollments and reduced drop outs in the area. The schools have requested for more educational kits for the coming academic year and CGPL has readily agreed to support this initiative. They are always supportive and helpful when required. CGPL has ushered in a new dynamism and positive outlook in people with their efforts”.

Mr. Gameti, Taluka Development Officer, Mandvi

Future vision

To launch program which can increase awareness within the community due to readily available, quantifiable results which can translate into higher demand for quality education, the children can ultimately get more comfortable while engaging with diverse texts, their capabilities to cope with their curriculum enhances leading to higher learning competencies. This can also be taken forward through the convergence with the ongoing Government program. CGPL will continue to engage with the teaching fraternity in this regard.

Theme 5: Community Organization and Institution Building



CGPL has adopted a wide definition of institution building, which entails structural reforms as well as capacity building and strengthening of existing institutions. Active community participation is the key to build an empowered community. Strong institutions enable community participation which is critical to community success.

CGPL has taken up important initiatives like VDAC and Community Information Centre (CIC) to ensure community participation by building and strengthening democratic and people-centric institutions.

VDAC – Empowering Fishermen

The most important initiative undertaken by CGPL for the fishermen community in Modhva village has been to advocate and support the establishment of VDAC.

It is a committee parallel to the panchayat to look after the planning and execution of development work in the village. The prime objective of the formation of the VDAC was to create ownership among the community for development of the village. Initially, CGPL team faced a lot of resistance from the villagers in the formation of this institution.



Distribution of Fishing nets to Fishermen in Modhva Hamlet

But after a series of discussions and participatory and consultative approach, the community members understood the importance and relevance of VDAC and the present VDAC was set-up. This initiative provides a forum to discuss issues and then prioritize them and work accordingly. VDAC deals with various organizations including the Government and NGOs working for the overall progress and development. It substantiates and supports the panchayat in developmental work and also works in collaboration with CGPL to undertake various initiatives.

In addition to assessing the needs of the village, it helps in addressing the issues in a timely manner, independent of the Company.

Various other initiatives undertaken for the community and environment include timely health check-ups, animal husbandry support; need based livelihood, infrastructure development (solar lighting, improvement of roads), water and sanitation initiatives, and education support, among others.

"VDAC gives the villages a better bargaining power to avail Government schemes. It has helped in getting investments to start the VIII standard in our village school, construction of road sanctioned and in availing various other subsidies, loans and grants. Our village has always been in the hinterlands and ignored. No other organization has done any work here. I am certain CGPL shall always maintain this level of commitment to the village and us, fishermen folk,"

Mammadbhai, 40 years old, Modhva village Fisherman

Theme 6: Safety & Health at Mundra

At Mundra UMPP, safety has been adopted as a core value rather than simple priority. CGPL is committed to ensuring zero harm to its employees, contractors and the communities in which it operates. This is integral to the company's business processes and it is focusing on continual improvement in the areas of health & safety.

While safety in power plants is traditionally incorporated once the plant is operational, in the case of CGPL, safety and health best practices were created keeping in mind the safety requirements of all levels of workforce and were incorporated from the start of the construction phase of the project.



Two times Mundra UMPP has
achieved
TEN MILLION SAFE MANHOURS

Safety Initiatives

CGPL team has done its best in organizing resources and tools to make the working at the project site safe. Many initiatives has been taken, some of these are as follows:

- **Empowered and experienced safety team**

Following safety personnel were involved to ensure safety at site:

- Corporate safety – this team is there to guide and support CGPL safety team.
- CGPL safety team – this team is responsible for leading and coordinating safety efforts at site. Safetv team is headed by a senior & experienced professional.
- CGPL Safety stewards – these are a group of trained site safety personnel, who are always there at Site to see implementation of safety policies, guidelines and directly supervise safety at Site. During peak period there were 35 stewards at Site.
- Contractor safety supervisors – each contractor has his team of safety personnel who works only for their specified work area.



- **Seeking & learning from the best in the world**

CGPL team is learning and sharing with Corporate Safety, consultants, neighboring industries and other safety organization thru' following mechanism:

- Safety audit by Tata Power safety personnel from other locations
- CGPL safety personnel visiting other site and bringing home learning from there
- Learning from safety consultants – DuPont Was hired for safety system audits and help in rolling out best in the world safety practices at Site.
- Participating in regional & national seminars for knowledge sharing
- Organizing safety trainings for non-safety personnel of CGPL and other. These training started at the time of induction in the form of mandatory “safety induction” for all workmen and visitors.

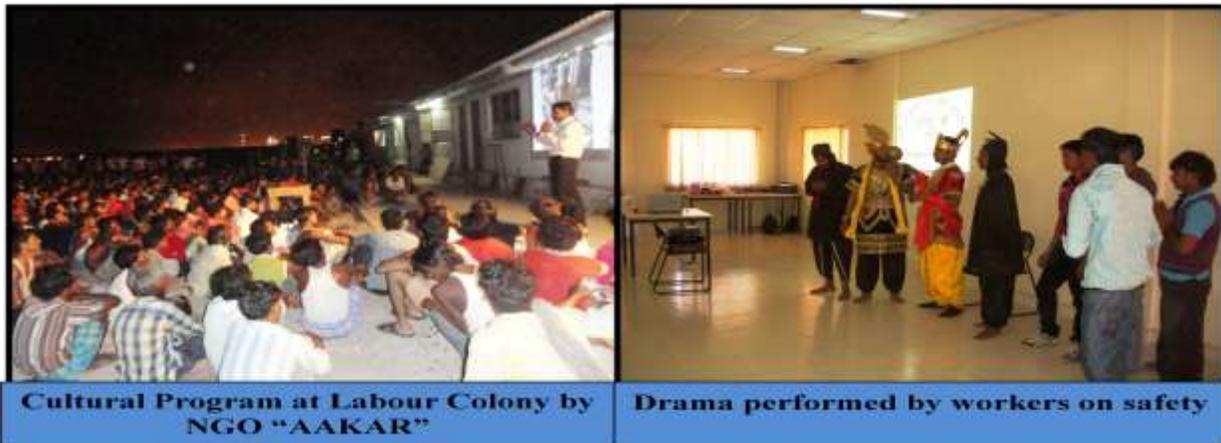
- **Working to change the mind set and behaviour of workforce**

In safety, personal behavior is most critical success factor. CGPL went extra mile to work on this aspect. Apart from safety trainings, talks, celebrations & so on, CGPL tried to change workmen response to safe working by “embedding” safety personnel in the workmen.

NGO out-reach program

An NGO, “AAKAR” is engaged to work with workers at their workplace and at their place of stay i.e. Labour Colony. NGO team got embedded in the labour and became part of them. The team changed labour behaviour by:

- Delivering Motivational /emotional talk about human Values at place of rest, canteen and work place
- Publishing “Safety Patrika’ a periodic magazine for labour
- Arranging movie, drama, musical nights and inserting safety message during breaks.
- Organizing safety skit “Khushbu Shuraksha Ki” program by labour for the labour etc.



These efforts showed remarkable changes in the safety behaviour of work force. Apart from working on workforce, CGPL works on their own staff for changing their behaviour. Some steps taken were:

- Safety is line function – the point was driven by senior leadership.
- Sending people on safety training
- Having “safety pause” i.e. stop all work; work on safety till the area become safe for work.
- Daily safety time-out – where unsafe acts and safety experiences during day is shared with everybody
- Morning safety oath – CGPL staff day starts with safety oath in the morning. During the oath, DIR (Daily Incident Report) near misses and safety incidents across Tata Power are shared with employees.
- Leadership driving safety – all project reviews will start with safety talk or safety review first.



- **Deploying best safety practices**

Some of the best safety practices deployed at Site are:

- Policy of “no supervision – no work”
- Mandatory PPEs – safety helmet, safety goggles, hand gloves and safety shoes are mandatory for all at Site. Other PPEs are job specific.
- Punitive actions – Punitive action and penalty system is in place. Repetitive violators removed from site.
- Job Safety Analysis (JSA) & Hazard Identification Risk Assessment (HIRA) – before start of any activity at Site.
- SCAR (safety corrective action request) – a photographic proof of unsafe act/condition issued to contractor to take corrective action.
- SIAT (safety intervention audit team) – A cross function team of line management guided by safety personnel doing safety audit of an area every day and presenting during safety time-out.
- PSUSR (pre-start-up safety review) – safety review of systems/ equipments before start-up.



Safety Time-Out



SIAT Team

Health Initiatives

To cater to medical needs of workforce, CGPL decided to have a dedicated medical facility at site. These facilities were built over a period of time. The dispensary was started in a temporary cabin but now CGPL has full-fledged 4 bedded occupational health centres. “ICU on wheels” and another smaller ambulance are provided for speedy evacuation of patients. CGPL’s medical teams cater to needs of all stake holders i.e. its staff, workmen and neighbours.

“I had a lot of difficulty in seeing from one eye as it was swollen very badly. The checkups at hospitals in the area are very expensive and related surgeries are even more expensive. It also takes long and is expensive to travel to avail any such medical help. CGPL organized an eye camp in the village which helped my condition considerably. CGPL's initiative has helped me in restoring my vision. For old people and women such camps are necessary as we can't travel much.”

Bachubhai Ramji, 72, Tunda Village, Eye Check-Up Camps, Beneficiary

- Medical Set-up: CGPL runs round the clock medical facilities at medical centre at site, labour colony & Staff Township. For other locations where CGPL staff resides, the company has arrangement with reputed hospitals. Additionally, collaborative arrangements are in place with all reputed / speciality hospitals in the vicinity.



- Neighbours' Health: Preventive and awareness medical camps are organised in the neighbouring areas. Neighbouring villagers are treated at CGPL medical facilities. Apart from providing medical facilities, CGPL medical team provides first aid training to the employees, medical audit of canteen staff, attend to medical emergencies and organise blood donation camps



- Workmen Health Services: Round the clock medical facility is provided at labour colony to cater to around 10,000 labour forces.

"We were educated on how to cure stomach aches, on hygiene issues, told how to calculate our Body Mass Index, what to eat to increase hemoglobin levels. Sessions are also undertaken to understand what issues women face. These topics which were once considered taboo are now openly discussed amongst women. There are women who feel shy to go to doctors for checkups, find it difficult to express their ailments and even more difficult to afford them. These health and referral camps were very beneficial to us. I am certain Mundra will prosper in coming years with CGPL constantly seeking to address pressing issues in the area."

Dakshaben, 36 Years Old, Tragadi Village

Future Aspects

"Safety First" has been the motto at Mundra UMPP right from day one & it has been pursued earnestly. But still the challenge is there as in coming months, whole plant will be operational & more precautions will have to be taken. Along with the initiatives those are already in place, many new practices will be implemented in near future. Work is going on in many areas like sharing the safety practices & incidents across Tata Power through video films, searching out for special types of gloves for workers to reduce finger injuries etc. So Mundra will continue to deliver the best by following proper safety norms & implementing best practices.

Theme 7: Environment & Biodiversity

The Mundra UMPP is part of the Government's strategic plan for catering to the country's energy needs. In addition, it is compliant with the IFC / World Bank norms. CGPL fully understands that in the current scenario striking the right balance between development and climate change concerns is crucial and Mundra UMPP is a step in that direction. Tata Power, the parent Company of CGPL, has always been a lead adopter of technology and Mundra UMPP is yet another example of the same. The Mundra UMPP features a number of new and advanced technological initiatives some of which are outlined below:

Super Critical Technology

The project uses supercritical technology. This technology and the choice of unit sizes will help save fuel for the project and cut down the GHG emissions compared to conventional coal-fired power stations.



In addition, the choice of imported coal significantly lowers sulphur emissions. The plant will use significantly less than the stipulated 1% sulphur and 10% ash content in coal. Lower ash content also helps in requirement of less area for ash disposal and lower impact on air quality. Advantages of using supercritical technology are:

- The boiler for supercritical 800 MW units is 'once through' type as against assisted circulation drum type boiler in 500 MW subcritical units
- The cycle efficiency of supercritical 800 MW units is higher as compared to subcritical 500 MW units

- These design features result in lesser fuel consumption per MW power output in 800 MW supercritical units as compared to 500 MW subcritical units

The GHG emission per kilowatt hour of energy generated is 750 grams of carbon dioxide per kWh as compared to India's national average of 1,259 g CO₂/ kWh for coal based power plants. Compared to any other subcritical power plants in India, this project will save 1.7 million tonne equivalent of coal per year.

The CGPL complex, in line with its intent to reduce its carbon footprint and promote green generation of power, has adopted multiple approaches, including installing a micro-hydel plant in the outfall channel to harness the flow of water (under construction), and the installation of a solar plant at the township to cater to the hot water requirements of the kitchen facility.

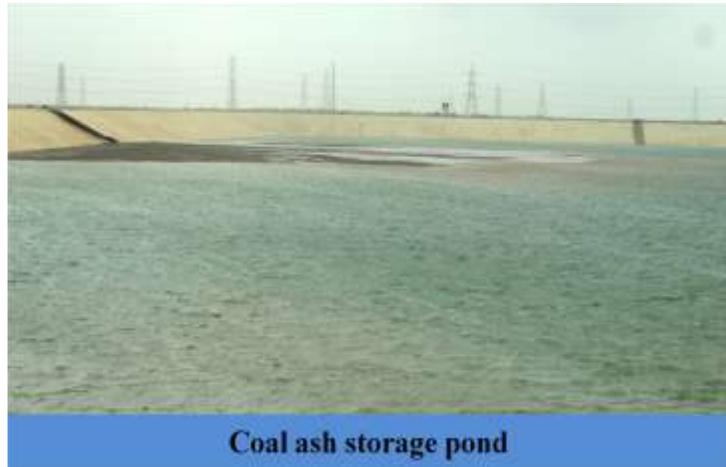
Other Eco-friendly Technologies

- High efficiency Electro Static Precipitators (ESPs) have been installed to control particulate matter emissions. Fly ash from ESP is transferred in closed pneumatic pipelines which help in controlling fugitive emission.
- Low Nox Burners for burning of pulverized coal are specially designed to reduce at least 35% Nox emission in comparison with other burners
- 275 meter tall stacks for dispersion of the emitted gases so that minimum impact is felt at ground level
- 7 kilometers long outfall channel is constructed to ensure enough cooling of hot condenser cooling water, before it is released to sea
- Effluent Treatment Plant (ETP) is provided for treatment of the plant drains and other effluents
- Sewages Treatment Plant (STP) is provided for treatment of the sewage and domestic effluent. Water from STP is being used in Green Belt development
- Dust Control is provided at point of dust generation e.g. ash silo, ESP, bunker silos etc.
- Hoods in coal conveyor and dust suppression systems are provided in coal handling area
- Dry Fog System is provided in all junction towers to control Fugitive Dust emission



- HDPE lining in ash pond and outfall channel to avoid ash water / sea water ingress into ground
- Noise Control: Special acoustic enclosure provided to control TG noise level

All coal ash generated from the plant is collected and stored within the plant premises in silos and ponds. Dry ash is transported in closed and sealed bulk carriers for utilization in cement industry. There is no possibility of any ash being exposed to the environment or probability of release of heavy metals that can bio accumulate, as has been wrongly construed by some.



CGPL has provided a well designed and lined ash pond in line with the Govt. of India guidelines to store the ash, which is only a backup arrangement. Primary efforts are towards full utilization of dry fly ash.

CGPL recognizes fugitive emissions from coal conveyors and stockpiles as potential pollution sources leading to possible health related discomfort to nearby communities – particularly Vandh village (considering its proximity to Adani and CGPL coal conveyor).



Wind barrier and peripheral green belt under development (before)

Wind barrier to reduce coal dust (after)

In view of above, CGPL is developing a peripheral green belt of 100 meters width along the space between the boundary wall and coal yard. This is being done in partnership with INTACH. Wind barriers of 9 meters height are installed near the coal yard to control coal dust fugitive emissions resulting from high wind speed characteristic of Mundra coast region.



The drop of the outfall channel is specially made up of concrete blocks and stones to create additional surface area while the water gets discharged for further cooling. This gives a cascading effect to water, which results in a little froth formation. Such froth is also seen sometimes on the shoreline due to the action of the waves, and is not an uncommon phenomenon in nature. There is a misconception that this is due to use of chemicals.

Environment conservation and beyond

CGPL is committed to environment conservation through several initiatives. It has been taken up a massive tree plantation programme on over 430 hectares of project land. Over 1,40,000 trees of indigenous species have been planted. Further plantation of 1,00,000 trees is planned in this year. Finally nearly one million trees shall be planted in next 3-4 years.

Further efforts are being made by CGPL in developing “manmade ponds” in the green belt area through use of recycled water. The ponds are to serve as potential eco restoration zones providing habitat for local and migratory bird species.

“Sustainability forms the core of our company’s vision and we will continue to focus on carrying forward our green legacy.”

Krishna Kumar Sharma, ED & CEO, CGPL



A view of the manmade pond

Environment Awareness Campaigns

CGPL actively conducts environment awareness workshops among employees, workers and neighbouring communities. For this, various promotional activities are organised in neighbouring villages. Every year “Environment Day” is celebrated with great fervour and wide participation.

On this occasion, various programmes such as tree plantation, environment slogan writing contests and quiz competitions are organised. Employee families, particularly kids are encouraged to participate in these programmes. Under this programme, school children are given an exposure on electricity conservation with the intention that they will become the ambassadors and champions of energy conservation.



Environment awareness session at village school

Pollution Control and Monitoring

Baseline environment monitoring of Mundra UMPP was started in December 2007, much before the commencement of construction work. The following parameters are being monitored:

- Ambient air quality in and around the project location
- Soil quality within the premises
- Surface and ground water quality within and around the premises
- Noise monitoring within and around the premises
- Marine ecological survey in the sea
- Sea water intake and outfall water quality
- Meteorological parameters like rain fall, solar radiation, humidity, wind etc.



From the visitors book

“On behalf of Eskom, I would like to express our gratitude for being ‘royally’ treated on our visit today. The Tata staff, we have found, are passionate, proud and open to sharing and answering extensive requests from our side. The value we have gained today is significant and the learning larger. We will certainly continue on our new found relationship. As appreciative to the whole team. Thank you”.

ESKOM, South Africa delegation at CGPL site on 6th Dec 2011

In addition to the above, two continuous Ambient Air Monitoring Stations, one in the plant and other in the officers colony (Aashiyana) are provided to update on environment conditions. The environment performance parameters are being monitored at Corporate Centre to ascertain compliance through an online system - “DISHA”.

Environment Legacy and compliance efforts

In order to predict anticipated impact due to UMPP, it was necessary to obtain baseline information of the environment, as it exists, which serves as the datum. Baseline data collection for each of the environmental components was based on the location of the project. The study area was defined for each of the environmental components independently taking into consideration the vulnerability of the environmental component with respect to activity of the project. Results of the monitoring of ambient air quality (Jan 2008 to Dec 2008) at six villages around the plant are given in Annexure-II.

Baseline Marine environment

Within the Gulf, though water depths of 25 m exist in the broad central portion up to the longitude 70°E, the actual fairway in the outer Gulf is obstructed by the presence of several shoals. The high tidal influx covers the low lying areas of about 1500 km² comprising a network of creeks and alluvial marshy tidal flats in the interior region. The creek system consists of 3 main creeks Nakti, Kandla and Hansthal, and the Little Gulf of Kutch interconnecting through many other big and small creeks. All along the coast, very few rivers drain into the Gulf and they carry only a small quantity of freshwater, except during the brief monsoon. They are broad-voleyed and their riverbed is mostly composed of coarse sand and gravel. The Gulf is characterized by numerous hydrographic irregularities like pinnacles, as much as 10 m high. The southern shore has numerous islands and inlets covered with mangroves and surrounded by coral reefs. The northern shore is predominantly sandy or muddy. The marine environment information is attached at Annexure-III.

Some of the pictorial view of project activities



State of the art dry fog system to control fugitive dust from transfer points



Water spray on the coal pile to reduce the fugitive dust



Fly Ash Silo for safe storage of Fly ash and pneumatic conveying system to avoid any fugitive emission during transportation of Fly Ash



HDPE impervious Lined Ash Pond to avoid ash water ingress into ground



Effluent Treatment Plant (ETP) and sewage Treatment Plant (STP) for treatment of different effluent from Coal pile run off, plant drains and Sewage resp.

“Eco – Restoration & Sustainable Management at CGPL Mundra, Gujarat”

Most of the anthropogenic and industrial infrastructure development activities generate pollution. Hence it is imperative that pollution is controlled at source itself. Numerous mechanical devices are used for controlling pollution at the process level, some amounts, however, still are released to the environment. This is especially true of air pollutants from thermal power plants.

Green belts are effective measure in such scenarios, where green plants form a surface capable of absorbing air pollutants and forming sinks for the pollutants. Leaves with their vast area in tree crown, sorbs pollutants on their surface, thus effectively reducing their concentration in ambient air. Often, the sorbed pollutants are incorporated in metabolic stream and thus air is purified. The dust and ash particles remain on leaf surface and eventually get deposited on ground either with leaf fall or by physical movement with air or rain. Plants grown in such a way to function as pollutant sinks are collectively called Green Belt.



Base Natural Condition of Project Site

- 1) **Soil:** Soil is generally saline and/or sodic in the area of power plant, with low organic matter content and in certain area the pH is too high to support vegetative growth of tree species.
- 2) **Vegetation structure** of CGPL site is characteristic of the Kachchh area. It is characterised by arid vegetation dominated by *Prosopis cineraria*- *Capparis deciduas*- *Ziziphus nummularia* families. The forest type is essentially thorn forest composed of species like *aerva javanica*, *Prosopis cineraria*, *Capparis deciduas*, *Sericostoma pauciflorum*, *Acacia jacquemontii*, *Calotropis procera*, *Cassia auriculata*, *Leptadenia pyrotechnica*, *Lycium barbarum* etc.
- 3) **Prosopis Juliflora:** The lands cleared of indigenous vegetation have on cessation of farming, been largely invaded and colonized by ‘kikar’, an aggressive exotic species, which has now dominated the area almost eliminating native vegetation. It is observed that in the non-plant area nearly 30% of the land is covered by this species and there is substantial spreading infestation between High Tide Line (HTL) and southern [along coast] boundary of CGPL.
- 4) **Mangroves:** Mangroves are salt tolerant plants found mainly in tropical and subtropical intertidal regions. *They prevent soil erosion and act as a buffer for the mainland from storms to protect the coast from erosion.* The coastal wetland of the Kachchh district with numerous creeks and channels associated with shoals and vast tidal flats have one of the richest

mangroves along the west coast of India. Hence, a portion of the mangroves of the Kachchh region is classified under the “West Mangrove Reserve Forest”. The estimated area covered by mangroves in Kachchh based on satellite data has increased from 601.8 square kilometer to about 938 square kilometer in 1998. However, the CGPL coastline is bereft of mangroves.



As per the report of Forest Survey India (2011), total mangrove cover in Kutch region is 778 sq.km. It has increased by 3 sq km as compared to FSI 2009 assessment. Total Mangrove cover in Gujarat (as per FSI 2011) is 1058 sq km. The above data is collected from book named ‘Mangrove Restoration through Public Private Relationship’ by Gujarat Ecology Commission.

- 5) **Wind speed:** Wind speed is observed to be fairly high throughout the year peaking to 36 kmph on occasion in July. There being no wind barriers on site, this promotes higher evapo-transpiration rates in plants promoting quick wilting in the arid climate. In addition high wind speed accelerates soil erosion and increases evaporation from soil surface.
- 6) **Water:** The high temperatures, low relative humidity, low soil moisture creates a demand for sustained water supply of non-saline water for the initial period of a sapling’s life after which its own root system would have grown sufficiently to derive its water supply from the soil moisture.

Green Belt Plan

Green Belts on such industrial sites are composed of various areas/ components. Plantation at the CGPL site is designed with such tree species that will form an effective screen to sorb dust and other air pollutants.



Goal of the Plan

- i) Enhancing forest cover while achieving a self sustaining bio-diverse community of plants.
- ii) Achieving a per hectare higher magnitude of leaf surface area than with normal row plantation
- iii) Create a sizeable sacred grove planted with species having cultural connotations.
- iv) Achieve natural aesthetic values and a diversity of micro-habitats through landscape ecology.
- v) Conserve the soil condition, retard soil erosion and prevent land degradation.
- vi) Prevent saline water ingress into the water table.

Approach

It was proposed to enlist campus in the service of ecology and create a bio-diverse, rich and self-sustaining eco-system.

- i) Sustainability is to be attained by use of indigenous xerophytic vegetation
- ii) The assemblage of tree and plant species would be in the form of natural communities supportive of local micro-fauna. *Shrubs, too, would be planted to generate an under-storey.* Fodder grasses would also be planted in certain areas. As the flora of any region is unique, effort is being made to plant only the indigenous species of Kutch region as these species are adapted to climatic as well as soil conditions and therefore the chances of survival of these are greater.

- iii) The formal landscape zones would be very limited in area as these are constant guzzlers of water and other resources.
- iv) Watering of plants in non-landscaped areas would be required for at least 4 years before plants become self-sustaining and for this a system of drip irrigation and pitcher emitter irrigation would be proposed based on recycled domestic effluent treated in STP.
- v) Water management is to be done through incorporating water harvesting structures in the formal storm water drainage and also by recycling surplus treated effluents – for this the secondary level effluent would be upgraded through simple and robust bacteriological dosing treatment to tertiary effluent quality.

Plantation Plan

The entire area available for planting has been divided into 19 zones. Year wise plan for plantation is attached in Annexure-IV.

Species selection for both the green belt and for other plantations has been made keeping the eco-regional characteristics of Kutch under consideration. As the site is arid and has high wind velocity through most part of the year, wind breaks/shade will be provided for the plants.

Three tire plantation scheme comprising of tall, medium and small trees and shrubs. It is a compact green belt with a tree to tree spacing of 4 m c/c has been prepared.

Path Forward

- Complete development of Green Belt across the periphery of the plant. The proposed target date for the completion is December 2016
- Model Conformity study to validate the Marine Environment Impact Assessment
- Development work to use outfall channel as a water body for fish culture
- To enhance the livelihood of fishermen by increasing fish catch in their area of fishing
- Community awareness through various programmes for increasing consciousness on environmental impact and measures. The Community can take this forward in sustainable manner.

Theme 8: Rural Energy



The Company promotes sustainable energy solutions for communities residing around its plant and project locations. CGPL's initiative towards promoting green energy sources like biogas will benefit the local community. These clean and particulate-free sources of energy and reduce the likelihood of chronic diseases that are associated with the indoor combustion of fuels such as wood and coal.

Biogas

CGPL launched a bio gas project called Annapurna in convergence with Gujarat Agro Industries Corporate Limited (GAIC), Government of Gujarat. Under this project, household biogas units are distributed on a need basis amongst the residents of nearby communities.



Bio gas awareness session at Vandh

So far, 10 residents have been identified – three from Vandh, five from Tragadi and two from Motabhadiya. The beneficiaries were selected through focus group discussions, social interaction and community meeting through the Panchayat of Tunda Vandh, Tragadi and Motakandagara areas. The beneficiaries are being trained for commissioning, operation and maintenance of the units by technical experts from GAIC.

While CGPL, in partnership with the communities, is coordinating the implementation, GAIC is providing subsidy on a per unit basis. The capacity specification of each biogas unit is two cubic meters and it would provide cooking support for six to eight persons through one household unit. Taking the green initiative a step further, CGPL is also providing a Motivation Cash Award to villagers who opt for the unit.

Surya Prakash Project

Under project Surya Prakash, CGPL installed boat lights at fishing hamlets in Modhva village. The target for installation was 65 boats.

This project is an outcome of the decision taken at the VDAC meeting to install solar lights backed with batteries in the boats. This helps the fishermen in reducing their cost of fuel and extending their fishing hours. Traditionally, fishermen used kerosene operated lantern and battery operated light, which is expensive given their high operational and maintenance costs.



Solar light installation in boat

These lights have been installed in collaboration with the fisheries department, Government of Gujarat, and the community members. Apart from boosting their catch, this arrangement will help them avoid collision with other boats and rocks in the sea.

Way Forward

CGPL has provided unstinting support to the community and towards environment protection. The Company has been working with the communities to find the sustainable solution for the issues being faced by them.

Over the past years, CGPL has conducted social Impact assessment with reasonably well defined process of incremental information gathering, involving multiple, inter-related disciplines, to enable analysis and assessments, for the purpose of defining actions, either to remedy negative impacts or to enhance benefits.

CGPL strategies have taken the Company to a journey that spans the themes of education, health, income generation and livelihood, Safe drinking water, rural infrastructure development etc.

The Company has been contributing to the ecological betterment of the surroundings by optimizing the resource allocation and opting for low-carbon technologies. It has built economic sustainability by driving ecological competitiveness through various forces: land, energy, waste, water, air and carbon. CGPL is committed to environment conservation through several initiatives. Green valuation acts as a catalyst for this paradigm shift. Green belt has already been created around the plant. It will keep striving for the new technologies for maintaining the sustainability.

CGPL has always been fully compliant with statutory requirements and has proactively responded to the needs of the community. The Company has continuously taken feedback from the locals and on the basis of these it is redesigning its programs for the betterment of the community. Our endeavour is to become a “Neighbour of Choice”.

Annexure-I

The Journey of Four Years of Community Engagement Initiatives by CGPL:

Year: 2008-09					
Sr. No	Themes & Activities	Name of the village			
		Vandh	Tunda	Mota kandagra	Nana bhadiya
Income Generation & Livelihood Restoration					
1	Fodder Arrangement- 850 cattle	√	√	√	
2	Formation of SHG	√	√		
	Education				
3	Vocational/Technical training program through iLead- 1 centre- 300	√	√	√	
Health Initiatives					
4	Medical camps – 10	√	√	√	√
5	Reproductive Health Program during Mamta Diwas in Anganwadi centre		√	√	√
6	HIV/ AIDS workshops and capacity building programs/ awareness -3	√	√	√	√
7	Disability Certification activity in collaboration with other NGO's	√	√	√	
Rural Infrastructure Development					
8	Gaushala Construction with fodder storage	√	√		
9	Sanitation (Toilet & Bath room)	√	√		
10	Fencing the crematoria				√
11	Installation of street Lights	√	√		

Year: 2009-10					
Sr. No	Themes & Activities	Name of the village			
		Vandh	Tunda	Mota kandagra	Nana bhadiya
Income Generation & Livelihood Restoration					
1	Rural Entrepreneur Development Program	√	√		
2	Employment generation activities of SHGs training	√	√	√	√
3	Formation of SHG groups	√	√	√	√
4	Fodder distribution - 2360 cattle	√	√	√	
5	Vaccination camps for cattle	√	√	√	√
6	Training for Basic health care of cattle	√	√	√	√
7	Well recharge			√	
8	Deepening, desalting & repairing of ponds & Dams		√		
9	Farmers Training & Kit Distribution			√	
Education					
11	Awareness drive for education	√	√	√	√
Health Initiatives					
12	Awareness program for women & Child health	√	√	√	√
13	General Health camps	√	√	√	√
14	First aid training program				√
15	Eye checking camps			√	
16	Aids awareness programs			√	√
17	Health competition for children	√	√	√	
Rural Infrastructure Development					
19	Construction of tree guard		√		
20	Renovation of Crematorium				√
21	Construction of A.I. room				√
22	Roof rain water harvesting structures		√		
23	Chlorination for drinking water	√	√		
24	Installation of RO plant	√	√	√	√
25	Toilet & Bathroom for households – 204	√	√		

Year: 2010-11					
Sr. No	Themes & Activities	Name of the village			
		Vandh	Tunda	Mota kandagra	Nana bhadiya
Income Generation & Livelihood Restoration					
1	Provision of fodder to <i>Gaushala</i> trusts (for 2562 cattle)	√	√	√	
2	Skills training programs for SHGs (16 sessions)	√	√	√	
3	Exposure visit for cattle owners/ cooperative members	√	√	√	
4	Camel vaccination camp	√			
5	Construction of roof water harvesting structure in Anganwadi Centers		√		
6	Farmer training program (30 farmers)			√	
7	Sponsor youth for vocational training		√		
Education					
9	Provision of educational kits (150 students)	√	√	√	√
10	Organize awareness programs on de-addiction and malnutrition		√	√	√
11	Pre-school/ playing kits for two <i>Anganwadi</i> Centers	√	√		
12	Formation of Water Management Groups (49 students)		√	√	√
	Health				
13	Cataract camp			√	
14	Health camps	√	√	√	√
Infrastructure Development					
15	Jalmani program (Installation of RO Plants) in 12 schools		√	√	√
16	Renovation of Community Hall				√
17	Road Repairs (including culverts)	√			√
18	Construction of garden in partnership with government's Panchavati Yojana	√	√		
19	Construction of cricket stadium	√	√		
20	Household sanitation units (100)	√	√		

Year: 2011-12									
Sr. No	Themes & Activities	Name of the village							
		Vandh	Tunda	Mota kandagra	Nana bhadiya	Tragdi	Tragadi Bunder	Modhva	Other Village
Income Generation & Livelihood Restoration									
1	Provision of fodder to Gaushala trusts (for 3048 cattle)	√	√	√					
2	Cattle feed sales centre					√			
3	Animal husbandry, camel Vaccination camps	√							
4	Dairy collection centre				√	√			
5	Demonstration of drip irrigation methods				√	√			
6	Horticulture training				√	√			
7	Embroidery Cluster formation				√	√			
8	Tie and Dye Cluster Formation				√	√			
10	Water Resources Development				√	√			
11	Fodder Cultivation								√
12	Capacity Building - Basic Training, Leadership, Accounts Management, etc.	√	√	√	√	√			
Income Generation & Livelihood Restoration									
13	Formation of New SHGs (25)				√	√			
14	Formation of Adolescent groups				√	√			
15	Livelihood grant and Net Distribution to 479 fisherman					√			

Year: 2011-12 Contd...									
Sr. No	Themes & Activities	Name of the village							
		Vandh	Tunda	Mota kandagra	Nana bhadiya	Tragdi	Tragadi Bunder	Modhva	Other Village
Income Generation & Livelihood Restoration									
16	Support of fiber glass boats (2) numbers							√	
17	Support for promotion of Handicraft	√	√						
Education									
18	Establishment of Computer Kiosk in Primary Schools : 5	√	√	√	√				
19	English Speaking classes : 1		√						
20	Teachers training for improve quality of teachers - 4 sessions	√	√	√	√				
21	Lok dayro for community mobilization					√			
22	Education kits to new entrants : 625 Child	√	√	√	√	√		√	
23	NFE Adolescents Girl's Learning Centre : 2				√	√			
24	Adarsh Anganwadi				√	√			
Healthcare									
25	Health Camp	√	√		√	√	√	√	

Year: 2011-12 Contd...									
Sr. No	Themes & Activities	Name of the village							
		Vandh	Tunda	Mota kandagra	Nana bhadiya	Tragdi	Tragadi Bunder	Modhva	Other Village
Infrastructure									
26	Establishment of Community Information Centre (CIC)	√	√	√	√	√	√	√	√
27	Village Road Construction					√	√	√	√
28	Renovation of Community Hall				√				
29	Support for Drinking Water		√			√	√		
30	Installation of Solar Light							√	
31	Facilitating access for migrant fishermen						√		

Annexure-II

Ambient Air Quality Monitoring Results

Table 1: Monitoring results of RPM/PM10 in Ambient Air Monitoring (all values in $\mu\text{g}/\text{m}^3$)

Location	Tunda	Vandh	Mota Kandagara	Nana Bhadia	Siracha	Moti Khakhar	Project Site
Jan 2008	188.1	143.2	185.2	136.6	176.2	122.2	183.1
Feb 2008	158.0	107.0	115.5	87.6	117.8	104.8	126.9
Mar 2008	180.6	163.9	183.9	134.1	180.8	116.7	209.0
Apr 2008	173.1	173.1	182.0	138.6	157.6	137.8	213.5
May 2008	163.3	138.9	184.3	136.0	151.4	145.2	217.6
Jun 2008	201.3	185.4	200.9	113.4	189.3	184.2	282.7
Jul 2008	184.2	170.2	209.2	167.3	223.9	189.6	253.9
Aug 2008	80.6	89.8	92.3	100.2	98.8	94.3	92.2
Sep 2008	93.3	140.8	107.9	123.8	155.7	135.9	144.1
Oct 2008	121.8	130.6	103.2	167.4	152.7	155.4	147.2
Nov 2008	109.8	127.9	124.2	126.3	133.1	149.4	140.3
Dec 2008	127.0	132.3	159.3	152.0	158.3	151.6	141.2

Table 2: Monitoring results of SO₂ in Ambient Air Monitoring (all values in $\mu\text{g}/\text{m}^3$)

Location	Tunda	Vandh	Mota Kandagara	Nana Bhadia	Siracha	Moti Khakhar	Project Site
Jan 2008	3.9	3.9	4.1	4.2	3.7	3.9	4.3
Feb 2008	4.2	3.8	4.3	4.1	3.8	4.0	4.4
Mar 2008	4.4	4.3	4.4	4.2	4.0	4.2	4.9
Apr 2008	5.1	5.1	5.5	5.6	5.7	5.8	6.6
May 2008	5.1	5.0	5.7	5.6	5.6	5.7	7.1
Jun 2008	5.1	5.1	5.6	5.0	5.7	5.9	6.8
Jul 2008	4.7	5.3	4.8	5.8	4.9	5.2	6.6
Aug 2008	4.8	5.0	5.4	5.9	5.3	5.4	6.4
Sep 2008	4.9	5.0	5.4	4.9	5.8	5.5	6.8
Oct 2008	5.2	5.4	5.8	5.9	6.0	6.0	7.5
Nov 2008	5.2	5.2	5.4	5.2	5.8	5.8	6.6
Dec 2008	6.4	7.3	7.8	7.8	7.8	6.1	8.2

Table 3: Monitoring results of NOx in Ambient Air Monitoring (all values in $\mu\text{g}/\text{m}^3$)

Location	Tunda	Vandh	Mota Kandagara	Nana Bhadia	Siracha	Moti Khakhar	Project Site
Jan 2008	6.3	5.0	4.7	3.7	6.3	5.6	7.1
Feb 2008	6.9	5.5	5.9	5.9	6.3	6.0	6.9
Mar 2008	7.2	6.5	6.2	5.3	6.8	6.3	8.4
Apr 2008	7.3	7.2	6.7	6.9	7.4	7.4	10.7
May 2008	7.2	7.0	7.1	6.7	7.1	7.3	10.2
Jun 2008	7.4	6.8	6.3	6.8	7.0	6.9	10.0
Jul 2008	6.1	6.2	6.0	7.5	5.8	6.6	9.5
Aug 2008	5.8	6.3	6.4	7.8	6.4	6.5	8.3
Sep 2008	6.1	6.3	6.4	6.9	7.8	6.8	8.2
Oct 2008	6.5	6.9	7.1	7.7	7.5	7.6	9.7
Nov 2008	6.6	6.2	6.5	6.4	7.1	7.0	8.4
Dec 2008	8.2	12.6	9.1	9.9	9.5	6.8	11.0

Table 4: Noise level in Day Time dB(A)

Location	Tunda	Vandh	Mota Khandagra	Nana Bhadiya	Siracha	Moti Khakar	Project Site Near Site Office
Jan 2008	50.2	49.6	53.8	51.8	52.6	54.4	56.8
Feb 2008	51.2	49.1	54.2	52.6	52.6	54.4	56.0
Mar 2008	51.2	49.8	54.0	52.3	52.1	54.2	59.0
Apr 2008	54.1	51.7	56.1	54.8	53.9	53.9	60.5
May 2008	57.0	58.2	58.0	54.6	58.0	56.5	70.3
Jun 2008	63.3	66.8	60.6	62.8	62.7	67.9	74.8
Jul 2008	64.8	64.3	66.9	65.4	65.9	66.9	73.2
Aug 2008	63.6	65.6	61.5	63.6	60.4	64.1	73.7
Sep 2008	61.4	65.3	57.1	61.6	59.6	59.1	68.4
Oct 2008	61.2	59.3	56.3	58.8	61.3	61.6	70.1
Nov 2008	59.6	61.3	55.5	60.3	62.1	61.4	66.7
Dec 2008	55.8	54.1	55.1	55.8	55.7	58.4	62.1

Table 5: Noise Level in Night Time dB (A)

Location	Tunda	Vandh	Mota Khandagra	Nana Bhadiya	Siracha	Moti Khakar	Project Site Near Site Office
Jan 2008	48.4	48.5	50.8	48.8	46.7	50.5	44.7
Feb 2008	49.5	49.0	51.9	49.9	47.6	50.9	45.8
Mar 2008	48.4	48.3	49.5	49.0	47.6	51.0	50.3
Apr 2008	49.4	48.6	50.4	50.8	49.1	50.5	51.0
May 2008	47.7	51.2	51.3	48.6	49.4	49.2	60.0
Jun 2008	49.3	50.4	51.9	50.2	51.8	55.7	59.5
Jul 2008	48.8	50.9	52.0	50.7	51.3	52.6	66.1
Aug 2008	50.3	53.6	55.2	52.4	54.0	53.9	62.9
Sep 2008	51.4	53.4	50.9	51.9	51.0	50.9	58.2
Oct 2008	48.3	47.1	46.4	47.6	48.7	49.3	58.6
Nov 2008	49.7	50.4	47.3	50.2	50.9	50.8	56.6
Dec 2008	48.8	48.6	48.2	48.9	49.5	50.6	52.2

Annexure-III

Table 1: Sea water quality during December 2008

Parameter	Level	Location 1	Location 2	Location 3	Location 4	Location 5	Location 6
Temp (°C)	S	24.6	25.7	26.0	27.5	26.5	26.0
	B	24.8	25.5	26.0	27.5	26.0	25.7
Ph	S	8.1	8.0	8.0	8.0	8.1	8.0
	B	8.0	8.0	8.1	8.0	8.1	8.1
Salinity (ppt)	S	35.8	37.2	36.7	35.9	37.0	36.6
	B	36.1	37.0	37.3	35.9	36.7	36.6
DO (ml/l)	S	3.9	4.9	4.4	3.2	4.1	4.5
	B	4.1	4.6	4.3	2.9	4.3	4.4
BOD (mg/l)	S	2.9	1.4	3.2	1.9	3.2	3.2
	B	1.6	0.3	3.8	<0.2	3.8	3.5

Table 2: Season wise monitoring results of the water around Vandh

Period	Temp (°C)	pH	Salinity (%)	DO (ml/l)	BOD (mg/l)
Jan 2006	19.0 – 23.0	8.0 – 8.3	36.5 – 37.8	1.8 – 5.6	0.5 – 4.0
Apr 2006	25.9 – 29.0	7.8 – 8.0	36.4 – 37.3	4.6 – 4.9	0.8 – 5.2
Apr 2007	27.5 – 29.1	7.7 – 8.0	35.0 – 36.9	2.9 – 5.0	0.2 – 4.5
Oct 2007	28.1 – 30.1	8.1 – 8.3	34.0 – 35.2	2.6 – 5.9	0.2 – 4.6
Dec 2008	24.5 – 27.5	7.9 – 8.1	35.9 – 38.0	2.9 – 5.4	<0.2 – 5.4

Annexure-IV

Year Wise plantation plan:

Particular	Area In Hectare	No. of Plants	Year					Total
			FY11-12	FY12-13	FY13-14	FY14-15	FY15-16	
Zone - A	27	67500	0	67500	0	0	0	67500
Zone -B	19	47500	0	10000	37500	0	0	47500
Zone - C	38	95000	0	15000	40000	20000	20000	95000
Zone D	85	212500	21750	0	0	106250	84500	212500
Zone - E	53	132500	102179	0	30321	0	0	132500
Zone - F	20	50000	0	0	0	25000	25000	50000
Zone - G	17	42500	0	7500	35000	0	0	42500
Zone - H	29	72500	0	0	72500	0	0	72500
Zone - I	32	80000	0	0	0	40000	40000	80000
Zone - J	19	47500	0	0	40000	7500	0	47500
Plant ISBL	10	25000	0	0	7500	17500	0	25000
Zone - K	19	47500	0	0	47500	0	0	47500
Zone - L	2	5000	0	0	0	0	5000	5000
Zone - M	4	10000	0	0	0	0	10000	10000
Zone - N	6	15000	0	0	0	0	15000	15000
Zone - O	8	20000	0	0	0	20000	0	20000
Zone - P	7	17500	0	0	0	17500	0	17500
Behind 400 KV Sw. Yard	35	87500	0	87500	0	0	0	87500
Near Outfall channel	0.65	1625	0	1625	0	0	0	1625
Total	430.65	1076625	123929	189125	310321	253750	199500	1076625

Note: Plantation Density is 2500 trees per hectare.