

# CDM FOR SUSTAINABLE DEVELOPMENT?

Money for Nothing!!!

A People's Perspective





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# FOREWORD

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The Clean Development Mechanism (CDM) under the Kyoto Protocol is flawed in its design because it provides a means for industrialized countries to buy their way out of their responsibility by supporting projects in the South. In other words, earn carbon credits to gain the license to pollute! The CDM has also been termed as the 'Cheap Development Mechanism': cheap not only because it is cheaper to invest in projects in the South, but cheap because it offers incentives but does not deal with the real problem of reducing global carbon emissions.

Yet, CDM has come to stay because of its lucrative implications. Already India hosts the second largest number of CDM projects registered after China.

This study was undertaken to present a grassroots view on the implementation of CDM Projects and therefore challenge the current structure and functioning of the CDM. Considering that the CDM is meant not only to help countries in the North to meet their targets of reducing carbon emissions but to assure sustainable development, it is crucial that we address the question of how sustainable development is conceived and how projects relate to this objective of CDMs?

The study while providing an overview of CDM in India assesses seven projects in the tribal heartland of India. It explores the perceptions of those impacted by CDM. Most of us are aware that except for a handful, CDM projects are

almost entirely owned and controlled by the for-profit sector. It is worth exploring whether in the greed for profit the objective of sustainable development has been compromised, and if so how, and to what extent?

The more difficult question is that, if carbon trading continues, how do we create opportunities and niches, where sustainable development is safeguarded, not only as a notional principle but also in the actual code of conduct of the project proponents. Because, if in a business as usual scenario, CDM projects do not address life and livelihood issues of the marginalised then there is little meaning in having 'sustainable development' as its core objective. The study seeks to view the current situation and its implications for the communities. In this light it posits the ways in which we need to restructure CDM to benefit the poor concretely.

CDM cannot and must not be allowed to continue in its current form and process! The COP 15 at Copenhagen is a huge opportunity to pave the way for a future that belongs to us all, not only those in power and the minority rich. It is an opportunity to envision a new paradigm of development. This is an earnest appeal to the delegates, decision makers and all of civil society to reset the misplaced priorities and right what has gone horribly wrong.

Dr (Ms.) Nafisa Goga D'Souza

Executive Director, Laya, November 27, 2009

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## CDM FOR SUSTAINABLE DEVELOPMENT? - A PEOPLE'S PERSPECTIVE

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### RATIONALE

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The Clean Development Mechanism (CDM) is an arrangement under the Kyoto Protocol allowing industrialized countries with a greenhouse gas reduction commitment (called Annex 1 countries) to invest in projects that reduce emissions in developing countries as an alternative to more expensive emission reductions in their own countries. Apart from helping Annex 1 countries to comply

with their emission reduction commitments, the purpose of the CDM, is that it must assist developing countries in achieving sustainable development, while also contributing to stabilization of greenhouse gas concentrations in the atmosphere.

Hence, CDM has the twin objectives: to achieve Sustainable Development (SD) in host countries, and assist Annex-1 countries in achieving their emission reduction targets in an environment friendly and cost-efficient manner.

The Indian Government is promoting the CDM in its current form as it is a lucrative source of funds for the country. A large majority of the projects are undertaken by private companies. But the question that arises is whether these companies, deriving benefits from the CDM are really involved in sustainable development of the local communities, where the projects operate? To what extent have the communities benefitted by the CDM projects in their vicinity? This needed a reality check. The study was the outcome of this concern.

This study has examined in particular the nature of sustainable development addressed by CDM projects in

India. It examines and interprets people's perception on CDM projects and presents significant policy recommendations necessary for CDM projects to achieve their sustainable development obligations.

### OBJECTIVES

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- ▶ To acquire an overall perspective of CDMs in India;
- ▶ To undertake a primary assessment of CDM project sites in tribal areas with a focus on community perception;
- ▶ To recommend alternative measures for pro-poor community based CDM projects.

### METHODOLOGY

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#### DESK STUDY OF CDM PROJECTS

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A Desk Study was undertaken of CDM Projects in India registered under the UNFCCC. This entailed a content analysis of Project Design Documents (PDD), containing general and specific details of the project activity with respect to the following indicators:

- ▶ Status of projects;
- ▶ State-wise distribution;
- ▶ Typology of projects;
- ▶ CDM project size;
- ▶ Project proponents;

- ▶ Transfer of Technology.

#### CASE STUDIES OF CDM PROJECTS

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Case studies of seven 'typical' projects were undertaken in the tribal populated belt of four States: Andhra Pradesh, Orissa, Jharkhand, Chhattisgarh. The CDM projects that have already been initiated were selected and analysed based on the following parameters for sustainable development to determine the manner in which they have contributed to sustainable development:

- ▶ Sustainable Development Indicators by the Government of India;
- ▶ Sustainable Development indicated in the Project Design Document (PDD)s of the CDM proponents;
- ▶ Nature of implementation observed during site visits.

The Government of India or the Designated National Authority (DNA) which is the body for interim approval of CDM projects has developed four sustainable development indicators: social well being, economic well being, environmental well being and technological well being (See Chapter 2 for more details). Moreover, every PDD contains specifics on sustainable development sought to be achieved through the CDM Project initiated. Both these aspects were taken into consideration when analysing the project sites.

### SITE SELECTION

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The selection of the projects was based on the following criteria:

- ▶ Geographical location (projects were selected in areas that have a substantial local tribal population, with some projects established in the Scheduled Areas);
- ▶ Typology of projects: energy efficiency/waste heat recovery/ large hydro/biomass-waste to energy/social forestry;
- ▶ CDM project size: large/small;
- ▶ Project proponents: private/public/government.

### DATA COLLECTION AND SOURCES

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- ▶ Information gathered from the PDDs;
- ▶ People's perception: focused group discussions and interviews with community representatives:
  - The current sarpanch of the villages surrounding the site, and the sarpanch present during the stakeholder meetings carried out by the CDM proponent;
  - Residents of predominantly tribal colonies or settlements near the project site;
  - Farmers/cultivators in the case of biomass based or afforestation/reforestation projects.
  - Villagers residing near the project site
  - Trade union representatives

### COMPANY REPRESENTATIVES

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- Public Relations or Operational heads of companies carrying out the CDM
  - Employees of the company carrying out the CDM
  - Biomass contractors supplying to the project in case of renewable energy projects
- ▶ Personal Observation

### SIGNIFICANCE AND LIMITATIONS

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This study is significant with respect to being one of the few studies which critically assesses CDM projects with respect to sustainable development of tribal communities. However the sample of the study is limited to 75% of a desk study of the total CDM projects registered under the UNFCCC as of November 2009 and site visits to eight CDM projects in the central tribal belt of India. However with these initial insights, this study concludes with recommendations in favour of "community based CDM projects". It is expected that the recommendations from the study will help in influencing policies related to CDM at the national as well as the international level, more so before the new climate regime is in place beyond COP 15.

## OVERALL PERSPECTIVE OF THE CLEAN DEVELOPMENT MECHANISM\*

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The Clean Development Mechanism (CDM), defined in Article 12 of the Kyoto Protocol, allows a country with an emission-reduction or emission-limitation commitment under the Kyoto Protocol (Annex B Party) to implement an emission-reduction project in developing countries. Such projects can earn saleable certified emission reduction (CER) credits, each equivalent to one tonne of CO<sub>2</sub>, which can be counted towards meeting Kyoto Protocol targets.

### PURPOSE OF CDM

According to Article 12 of the Kyoto Protocol “The purpose of the clean development mechanism shall be to assist Parties not included in Annex 1 in achieving sustainable development and in contributing to the ultimate objective of the Convention, and to assist Parties included in Annex 1 in achieving compliance with their quantified emission limitation and reduction commitments under Article 3”.

### OPERATING DETAILS OF CDM

A CDM project must provide emission reductions that are additional to what would otherwise have occurred. The projects must qualify through a rigorous and public

*Kyoto Protocol sets binding targets on Annex 1 (developed) countries to limit their emissions below 1990 levels by 5.2% during the accounting period 2008-2012. CDM is one of the flexible mechanisms contained in the Kyoto Protocol to assist Annex I countries to achieve their targets. Non-Annex 1 (developing) countries that have ratified the protocol are eligible for CDM projects. India is a party to the UNFCCC and is therefore eligible for CDM projects.*

registration and issuance process. The approval is given by the Designated National Authority (DNA). Public funding for CDM project activities must not result in the diversion of Official Development Assistance (ODA).

The mechanism is overseen by the CDM Executive Board, answerable ultimately to the countries that have ratified the Kyoto Protocol.

Operational since the beginning of 2006, the mechanism has already registered more than 1,870 projects and is anticipated to produce CERs amounting to more than 2.9 billion tonnes of CO<sub>2</sub> equivalent in the first commitment period of the Kyoto Protocol, 2008–2012.

\* The analysis in this section is based on UNFCCC listing of projects and the documents sited on the [www.unfccc.int](http://www.unfccc.int) site

## THE PROJECT PROCESS

An industrialised country interested to gain credits from a CDM project must first obtain the consent of the developing country hosting the project (the project proponent) ensuring that the project will contribute to sustainable development. Then, using methodologies approved by the CDM Executive Board (EB), the applicant (the project proponent) is required to show that the carbon reductions would be beyond a business as usual scenario (establishing additionality) in a detailed project report called the PDD (Project Design Document). A baseline estimating the current emissions and the future emission reductions has to be estimated. The project is then validated by a third party agency, called a Designated Operational Entity (DOE), to ensure the project results in real, measurable, and long-term emission reductions. The EB then decides whether or not to approve the project. If a project is registered and implemented, the EB issues credits, called Certified Emission Reductions (CERs), commonly known as carbon credits, where each unit is equivalent to the reduction of one metric tonne of CO<sub>2</sub> or its equivalent.

## INSIGHTS FROM THE DESK STUDY

### STATUS OF CDM PROJECTS IN INDIA

India has the second largest CDM projects registered accounting for 25.77% of the world's total of 1870 projects.

S.NO.	STATE	ESTIMATED REDUCTIONS (TONNES OF CO <sub>2</sub> )
1	ASSAM	418850.00
2	BIHAR	4576821.00
3	DELHI	3072208.00
4	GUJARAT	104665010.00
5	HIMACHAL PRADESH	8361844.00
6	KARNATAKA	30979184.90
7	MADHYA PRADESH	9443110.00
8	PONDICHERRY	433470.00
9	PUNJAB	13078854.00
10	RAJASTHAN	46063943.00
11	SIKKIM	4659610.00
12	TAMIL NADU	28400071.00
13	UTTAR PRADESH	19753073.00
14	UTTARANCHAL	1246116.00
15	MAHARASHTRA	15222885.00
16	WEST BENGAL	428996096.00
17	CHHATTISGARH	15371739.71
18	ANDHRA PRADESH	12578140.00
19	ORISSA	3672314.00
20	JHARKHAND	1515355.00
21	GOA	1123570.00
22.	KERALA	622750
<b>TOTAL</b>		<b>754255014.6</b>

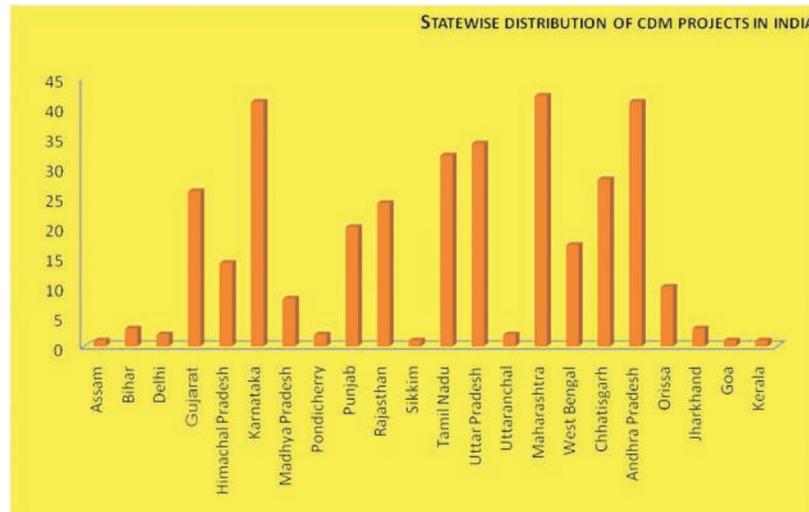
There are 461 registered CDM projects as of November 2009 which span across 22 states and Union Territories in India. However, it is to be noted that the National CDM Authority (NCDMA) in India has accorded Host Country Approval to 1226 projects as on July 2009 facilitating a possible investment of more than Rs.1, 51, 3.97 billion.

Out of 461 registered CDM projects in India until November 2009, this study has looked at 353 projects. It is estimated that all the 353 projects would result in reducing 754255015 tonnes of CO2 equivalent and hence these many Certified Emission Reductions - CERs (1 ton of CO2 equals 1 CER) within differing time periods.

The tonnes of CO2 reduction mean the equivalent amount of credits generated in developed countries. From the Indian perspective each tonne of CO2 reduction will result in resources coming into the country. At a conservative price of US \$ 10 per CER, it corresponds to an overall inflow of approximately US \$7.54 billion in the country.

### STATE WISE DISTRIBUTION OF CDM PROJECTS

More than one third or 124 approved CDM projects are located in just three states: Maharashtra, Karnataka and Andhra Pradesh. These are followed by



### STATE-WISE DISTRIBUTION OF CDM PROJECTS AS OF JULY 2009

STATE	Nos.	STATE	Nos.
MAHARASHTRA	42	ORISSA	10
KARNATAKA	41	MADHYA PRADISH	8
ANDHRA PRADISH	41	BIHAR	3
UTTAR PRADISH	34	JHARKHAND	3
TAMIL NADU	32	DELHI	2
CHHATTISGARH	28	PONDICHERRY	2
GUJARAT	26	UTTARANCHAL	2
RAJASTHAN	24	ASSAM	1
PUNJAB	20	SIKKIM	1
WEST BENGAL	17	GOA	1
HIMACHAL PRADISH	14	KERALA	1
<b>TOTAL: 22 STATES; 353 CDM PROJECTS</b>			

STATE	NO OF LARGE PROJECTS	NO OF SMALL PROJECTS
1. ASSAM	1	0
2. BIHAR	2	1
3. DELHI	1	1
4. GUJARAT	16	10
5. HIMACHAL PRADESH	1	13
6. KARNATAKA	15	26
7. MADHYA PRADESH	2	6
8. PONDICHERRY	0	2
9. PUNJAB	2	19
10. RAJASTHAN*	3	18
11. SIKKIM	1	0
12. TAMIL NADU	12	20
13. UTTAR PRADESH	15	19
14. UTTARANCHAL	1	1
15. MAHARASHTRA	11	31
16. WEST BENGAL	3	14
17. CHHATTISGARH	16	12
18. ANDHRA PRADESH	7	34
19. ORISSA	9	1
20. JHARKHAND	3	0
21. GOA	1	0
22. KERALA	1	2
<b>TOTAL</b>	<b>123</b>	<b>230</b>

projects in Uttar Pradesh. Tamil Nadu, Chhattisgarh, Gujarat, Rajasthan, Punjab. All other states have less than twenty projects. In the initial stage of CDM development in India, biomass utilisation projects, waste gas/heat utilisation projects and renewable energy (wind /hydro) projects were mainly being implemented. Other than those projects, India has a variety of registered CDM projects that include energy efficiency projects (cement, steel, etc.), fuel switch projects, hydro-fluro carbon (HFC) reduction and transportation projects.

### CDM PROJECT SIZE

An assessment has been made with respect to large and small projects. According to UNFCCC definition, small refers to all projects with a production capacity of less than 15 MW, and large project implies those that have a potential of more than 15 MW.

Out of 353 projects, 123 projects representing approximately 35% of the total projects may be considered large; 230 projects are small in nature.

### PROJECT PROPONENTS

Almost all the projects are held by private companies. Giant companies like ITC have 6 registered projects. The table depicts the project proponents, who have more than one registered projects.

	PROJECT PROPONENT	PROJECTS
1	ITC LIMITED, KHAMMAM, ANDHRA PRADESH	6
2	RELIANCE INDIA LIMITED, GUJARAT	3
3	GACL, GUJARAT	4
4	TATA CHEMICALS, UTTAR PRADESH	3
5	VIKARAM CEMENTS, MADHYA PRADESH	2
6	VAMSHI HYDRO ENERGIED PVT LTD, HIMACHAL PRADESH	2
7	GUPTA EXIM INDIA PVT LTD, PUNJAB	2
8	M/S INDIAN ACRILICS, PUNJAB	2
9	M/S NAHAR SPINNING MILLS, PUNJAB	2
10	SYNERGY GLOBAL PVT LTD, RAJASTHAN	2
11	BINANI CEMENTS, RAJASTHAN	2
12	INDO GULF FERTILISERS LTD , UTTAR PRADESH	2
13	MAWANA SUGARS LIMITED, UTTAR PRADESH	3
14	NEG MICRON INDIA LTD, TAMIL NADU	3
15	SLS POWER INDUSTRIES LTD, KARNATAKA	2
16	OCL INDIA LTD, ORISSA	4

Government involvement in CDMs is still relatively small. Gujarat State Electricity Corporation is a government body, which has one project which generates electricity using natural gas to support the grid. OPCL (Orissa Power

Consortium Limited), and Rourkela Steel Plant are public entities implementing one project each. OCL India Limited, Orissa is also a public entity which has 4 registered projects, out of which 3 are large and one small. All the 3 large projects are related to clinker reduction in cement industry. The small project is a waste heat recovery project. Karnataka Power Transmission Corporation is a state owned power utility acting as a project participant with Sai Spurthi Power Limited (a private entity) and shares CDM benefits in the ratio of 30:70.

There are very few projects held by the non-profit sector. NGO involvement in CDM projects is very limited. Only Himachal Pradesh, Karnataka, Bihar, Andhra Pradesh and Madhya Pradesh have 1 NGO each as project proponents. Out of 5 projects, four are on renewable energy and one is on energy efficiency in brick manufacture. M/S Sai Foundation in Kothi village, Kullu District, Himachal Pradesh is operating a 5MW Hydro Power Plant where the energy generated is to be sold to the State or other private parties. The Decentralized Energy Systems, Bangalore has an outreach of 100 villages for community based gasifiers of 5.15 MW. In Araria district, Bihar for micro industries, energy services and water pumping, the promoters are in partnership with various local co-operatives, societies, NGOs, local individuals and gram panchayats, who are interested in setting up their own micro-industries for economic development of their villages through renewable energy

sources. Women for Sustainable Development & Agricultural Development and Training Society (ADATS) have facilitated 5500 biogas plants of 2 sq mt each for cooking and heating in Narsamma, Chingnapalli, Gudibanda Taluks, Kolar District in Karnataka. In Madhya Pradesh, Technology & Action for Rural Advancement in collaboration with International Bank for Reconstruction and Development, Italy & Netherlands is involved with a CDM project related to efficient brick kiln technology to reduce energy consumption.

### TRANSFER OF TECHNOLOGY

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There are very few cases of technology transfer. However, there are no significant examples, except that of the Delhi Metro, which is supported by Japanese Carbon Finance Ltd.

A large number of projects are unilateral CDM projects, which mean that the CDM projects are developed by Indian stakeholders without the involvement of finance and technology from Annex I countries. Indian project developers implement the project by bearing transaction costs of CDM and taking on the risks of the projects. Therefore, the price of credits issued by unilateral projects tends to be higher than bilateral or multilateral CDM projects.

### CRITERIA FOR NATIONAL ENDORSEMENT OF CDM PROJECTS

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At the national level, CDM endorsement criteria have been established which include sustainable development indicators. These indicators have to be articulated in the project design documents. The project has to confirm, if it assists in achieving sustainable development. The four indicators stipulated by the Government of India are:

- ▶ **Social well being:** The Project should lead to alleviation of poverty by generating additional employment, Removal of social disparities, contributing to the provision of basic amenities to people leading to improve the quality of life of people;
- ▶ **Economic well being:** Project should bring in additional investment consistent with the needs of the people;
- ▶ **Environmental well being:** Impact of the project activity on resource sustainability and resource degradation, if any, due to proposed activity; bio-diversity friendliness; impact on human health; reduction of levels of pollution, etc;
- ▶ **Technological well being:** The project should lead to transfer of environmentally safe and sound technologies with a priority to the renewable sector or energy efficiency projects that are comparable to best practices in order to assist in up gradation of technological base.

### TYPE OF CDM PROJECTS IN INDIA

Biomass projects are in a significant majority comprising about one third of the total projects. This is followed by energy efficiency/fuel switch projects which are also substantial in number. Wind and hydro projects are more or less the same in number. Interestingly there is only one solar project which perhaps indicates the cost barriers. The fugitive emissions from production relates to reduction in hydro-fluro carbon (see Annexure –1)

### CDM PROJECTS IN THE STUDY AREA

Altogether there are 82 projects in the four states: Andhra Pradesh, Orissa, Chhattisgarh, and Jharkhand. Andhra Pradesh has the largest number of projects followed by Chhattisgarh. Jharkhand has only 3 projects.

- ▶ **Andhra Pradesh:** Of the 41 projects in Andhra Pradesh 50% are biomass based using agricultural residues. The energy generated is all sold to APTRANSCO.
- ▶ **Chhattisgarh** has equal number of energy efficiency

No	TYPE OF PROJECT	TOTAL
1	WASTE HEAT UTILISATION RECOVERY PROJECT	29
2	INDUSTRIAL PROCESS/ MANUFACTURING	20
3	HYDRO	45
4	BIOMASS	115
5	SOLAR	1
6.	WIND	54
7	ENERGY EFFICIENCY/FUEL SWITCH	75
8	SOLID WASTE MANAGEMENT	3
9	METHANE RECOVERY	9
10	FUGITIVE EMISSIONS FROM PRODUCTION	2
<b>TOTAL</b>		<b>353</b>

SEE ANNEXURE 1 FOR STATE WISE DETAILS

PROJECTS	ANDHRA PRADESH	ORISSA	CHATTISGARH	JHARKAND	TOTAL
WASTE HEAT UTILISATION RECOVERY PROJECT	3	3	-	3	9
INDUSTRIAL PROCESS/ MANUFACTURING	3	2	2	-	7
HYDRO	3	2	-	-	5
BIOMASS	22	-	13	-	35
SOLAR	-	-	-	-	-
WIND	2	-	-	-	2
ENERGY EFFICIENCY/FUEL SWITCH	7	1	13	-	21
SOLID WASTE MANAGEMENT	-	2	-	-	2
METHANE RECOVERY	1	-	-	-	1
<b>TOTAL</b>	<b>41</b>	<b>10</b>	<b>28</b>	<b>3</b>	<b>82</b>

and biomass projects. Energy efficiency projects are mostly waste heat recovery in sponge iron production of iron and steel plants. Biomass projects are mainly rice husk based as Chhattisgarh is the rice bowl of the country. There are all big corporations like Jindal, Monnet, Mahindra, and Century apart from many others.

- ▶ **Orissa:** Most of the projects relate to energy industries involving waste heat recovery, industrial processes, hydro based and solid waste management, etc. Four projects are owned by a Govt Public Sector Unit (PSU) called OCL which has a major stake in CDM projects in the state. However there is no biomass based project in the state.
- ▶ **Jharkhand:** All projects are related to waste heat recovery in sponge iron plants. All are owned by three major iron and steel companies and implemented in the most backward Sariaikela District of Jharkhand.

### **ANALYSIS OF SUSTAINABLE DEVELOPMENT INDICATORS**

An analysis of the Government of India (GoI) indicators for sustainable development and the PDDs was undertaken. (See Annexure II)

**Social well being:** A majority of the PDDs mention about increase in employment opportunities. However, the specific figures on the extent of employment to be generated by the project have been presented only in 2 projects: Kolab and Samal hydro projects. The rest of the

PDDs are vague on the numbers. Only some of them, namely the two hydro projects commit towards availability of basic services in the form of health, communication, drinking education, etc. The biomass projects reflect increase in employment for a limited period during collection and transportation of crop residues/biomass, etc. Aarti and ITC paper and pulp have mentioned elimination of need of coal towards ensuring social well being. ITC for instance does not refer to the employment criteria at all. Also, there is no articulation in any of the projects as to how these projects would facilitate removal of social disparity.

**Economic well being:** The PDDs envisage economic well being in the context of the additional investments to be triggered by installation of the project in the area like increase in business opportunities, etc. Some of the PDDs have articulated this aspect in terms of reduced cost of production (therefore savings); benefit to the state in terms of taxes; additional income from crop residues in case of biomass projects. It can be assumed that by virtue of being a CDM project, such initiatives have a potential to bring in additional investment, but the question that needs to be answered is whether, the additional investment consistent with the needs of the people or the company? Economic development from the perspective of civic amenities is only evident to some extent in the case of the hydro projects.

**Environmental well being:** Across all the PDDs replace-

ment/reduction and conservation of coal/fossil fuel has been highlighted. Reducing GHG through renewable/reducing thermal pollution has been articulated in most of the PDDs. However, there is no mention of how such projects affect the local biodiversity with its impact on local flora, fauna, soil, water, ecosystem, etc. There is also no discussion of how such projects affect resource sustainability and resource degradation.

**Technological well being:** In most of the cases, the PDDs talk about using cleaner and efficient technology (being environmentally safe and sound). A majority of these projects claim to be the pioneers in using the advanced technology thereby creating a model for others to replicate/emulate. In most of the cases, the PDDs refer to in house technology or hiring of experts for developing scientifically established efficient processes. There was no mention of inter country technology transfer in the projects studied.

Overall, the explanation of the various indicators that have been spelt out by the Gol did not find a place in the PDDs. A comparison between what has been outlined by the Designated National Authority and the PDDs indicates that the articulation of Sustainable Development clearly overlooks the components that need to be fulfilled under each of the four indicators stipulated by DNA. What was clear from the PDD documents is that the indicators of the PDD did not match with the indicators set by the Gol. This

means that at the level of intent itself there were gaps.

It is important to state here that the Gol indicators themselves are vague and do not explain each of the broad indicators adequately. There is a further dilution of the indicators at the level of the PDDs. It is clear that the component of sustainable development was not examined adequately by the Designated Operational Entities (DOE). This is indeed a serious matter particularly because one of the objectives of the CDM is to ensure sustainable development.

*The government indicators need to be fleshed out into **specific deliverables** which can be **quantified**. A clear set of guidelines need to be put in place for each of the indicators by the DNA. This can ensure that the CDM project fulfil its objective to ensure sustainable development of the local communities and the entire ecosystem.*

The following chapter will further analyse whether the diluted version of sustainable development specified in the PDDs is implemented. It presents the insights gained from each of the case studies undertaken.

## STATE WISE ANALYSIS OF CDM PROJECTS IN INDIA

STATE	ANALYSIS
MAHARASHTRA	HAS THE MAXIMUM NUMBER OF WIND PROJECTS IN THE COUNTRY. BIOMASS ALSO CONTRIBUTES TO A SIGNIFICANT PART OF THE CDM MIX FOLLOWED BY FUEL SWITCH AND MANUFACTURING RELATED PROJECTS.
KARNATAKA	MAJORITY OF THE PROJECTS ARE RENEWABLES COMPRISING AROUND 85% OF THE TOTAL. THERE ARE 15 HYDRO PROJECTS, OUT OF WHICH 50% ARE LARGE PROJECTS VARYING FROM 20-25 MW. BIOMASS PROJECTS ARE MOSTLY BAGASSE BASED COGENERATION PROJECTS WHICH USE UPGRADE TURBINE AND BOILER FOR AUGMENTING IN HOUSE CONSUMPTION AS WELL AS SUPPORT THE STATE GRID. THERE IS ONLY ONE PROJECT BY KARNATAKA POWER TRANSMISSION CORPORATION LTD WHICH IS A HYDRO BASED ONE. ALL OTHER PROJECTS ARE OWNED BY PRIVATE BODIES. ONE BIOMASS PROJECT IS OWNED BY AN NGO WHICH IS A BIOGAS PLANT WHICH GENERATES GAS FOR HEATING AND COOKING OF LOCAL COMMUNITIES.
ANDHRA PRADESH	50% OF THE PROJECTS ARE BIOMASS BASED UTILISING VARIOUS TYPES OF AGRICULTURAL RESIDUES. THE ENERGY GENERATED IS ALL SOLD TO APTRANSCO.
UTTAR PRADESH	BAGASSE BASED BIOMASS PROJECT COMPRISE A MAJORITY OFF THE PROJECTS AS UP HAS NUMEROUS SUGAR MILLS. ENERGY EFFICIENCY IN CHEMICAL AND FERTILISER INDUSTRIES ALSO FORM PART OF THE CDM PROJECTS OF THE STATE.
TAMIL NADU	A MAJORITY OF THE PROJECTS ARE BASED ON RENEWABLES PREDOMINANTLY WIND (MOSTLY BUNDLED) AND BIOMASS. THESE ARE THE WIND RICH AREAS OF THE COUNTRY HAVING MORE THAN 388/ M2 AT 50 MTS. HEIGHT, IDENTIFIED BY THE MINISTRY OF NON CONVENTIONAL ENERGY SOURCES (MNES).
CHHATTISGARH	THERE ARE EQUAL NUMBER OF ENERGY EFFICIENCY AND BIOMASS PROJECTS. BIOMASS PROJECTS ARE MOSTLY RICE HUSK BASED (AS CHHATTISGARH IS THE RICE BOWL OF THE COUNTRY) TO GENERATE ELECTRICITY WHICH FEEDS INTO THE LOCAL IRON AND STEEL UNITS. ENERGY EFFICIENCY PROJECTS ARE MOSTLY RELATED TO WASTE HEAT RECOVERY IN SPONGE IRON PRODUCTION OF THESE IRON AND STEEL PLANTS. THERE ARE 22 IRON AND STEEL COMPANIES (ALL PRIVATE) WHO OWN THE CDM PROJECTS AND THEREBY EARN BENEFITS.
GUJRAT	A MAJORITY OF THE PROJECTS ARE ENERGY EFFICIENCY AND FUEL SWITCH PROJECTS. IT HAS THE ONLY SOLAR CDM PROJECT IN THE COUNTRY WHICH IS A SOLAR COOKING UNIT FOR COMMUNITY KITCHENS. GUJARAT HAS HUGE INDUSTRIES AND BIG CORPORATE PLAYERS WHO HAVE TAKEN A MAJOR CHUNK OF THE CDM PROJECTS. SOME OF THE INDUSTRIES ARE RELIANCE, JINDAL, TATA, APOLLO, ESSAR, ONGC, IFFCO ETC.
RAJASTHAN	MORE THAN 50% OF THE PROJECTS ARE RENEWABLE BASED- BIOMASS AND WIND. THE OTHERS ARE FUEL SWITCH PROJECTS FOR THE OBJECTIVE OF GHG EMISSION REDUCTION.
PUNJAB	80% OF PROJECTS ARE BIOMASS PROJECTS BASED ON UTILISATION OF RICE HUSK AND MUSTARD RESIDUE. PUNJAB BEING PREDOMINANTLY AN AGRICULTURAL STATE USES BIOMASS TO GENERATE CLEAN POWER. IT HAS NO COAL MINES, OIL WELLS OR TIDAL ENERGY AS OTHER POSSIBLE EXPLOITABLE SOURCES. HENCE EXPLOITATION OF RENEWABLES HAS BEEN EMPHASISED BY PUNJAB RENEWABLE ENERGY DEVELOPMENT AGENCY (PEDA)

STATE WISE ANALYSIS OF CDM PROJECTS IN INDIA

STATE	ANALYSIS
<b>WEST BENGAL</b>	MOST OF THE PROJECTS ARE ENERGY EFFICIENCY PROJECTS WHICH AIM AT IMPROVEMENT MEASURES. MAJOR PLAYER IS CESC LTD WHICH IS A CONGLOMERATE OF RPG GROUP OF INDUSTRIES AND IS A PUBLIC LTD COMPANY. PROJECTS TO REDUCE FUEL CONSUMPTION OF ENERGY GENERATION THROUGH IMPLEMENTATION OF ENERGY EFFICIENT MEASURES AND TECHNOLOGIES ARE THE MOSTLY IMPLEMENTED. ITC ALSO OWNS 3 PROJECTS ON ENERGY EFFICIENCY
<b>HIMACHAL PRADESH</b>	MAJORITY OF THE PROJECTS ARE SMALL HYDRO PROJECTS VARYING FRO 3 MW- 10 MW. ONE OF THESE HYDRO PROJECTS IS FACILITATED BY AN NGO. THE PURPOSE OF ALL THESE PROJECTS IS TO GENERATE ELECTRICITY AND SELL IT TO THE STATE GRID
<b>ORISSA</b>	THERE IS ALMOST AN EQUAL MIX OF PROJECTS. HOWEVER THERE IS NO BIOMASS BASED PROJECT IN THE STATE. MOST OF THE CDM PROJECTS ARE RELATED TO ENERGY INDUSTRIES AS CLINKER REDUCTION, TYRE MANUFACTURE, WASTE HEAT RECOVERY, ETC OR ARE HYDRO BASED. FOUR PROJECTS OF THE TOTAL TEN PROJECTS ARE OWNED BY A GOVT PUBLIC SECTOR UTILITY (PSU) CALLED ORISSA CONSORTIUM LTD (OCL) THEREBY HAVING A MAJOR STAKE IN CDM PROJECTS IN THE STATE
<b>MADHYA PRADESH</b>	MAJORITY OF THE PROJECTS ARE BIOMASS BASED WHICH UTILISE RICE HUSK TO GENERATE ELECTRICITY FOR SALE TO THE GRID. ONE PROJECT ON ENERGY EFFICIENCY AND FUEL SWITCH IS OWNED BY AN NGO. THIS PROJECT UTILISING EFFICIENT BRICK KILN TECHNOLOGY IS A BUNDLED PROJECT IN 12 SITES ACROSS 4 STATES
<b>BIHAR</b>	THREE PROJECTS IN ALL WHERE ONE IS ON INDUSTRIAL PROCESS CONCERNED WITH CLINKER REDUCTION/ REPLACEMENT IN CEMENT INDUSTRY. THE OTHER TWO PROJECTS ARE BIOMASS BASED, (BAGASSE BASED) TO GENERATE ELECTRICITY FOR IN-HOUSE CONSUMPTION AS WELL AS SALE TO GRID. ONE OF THE BIOMASS PROJECT IS FACILITATED BY AN NGO WHICH IS A COMMUNITY BASED GASIFIERS SUPPORTING 100 HOUSEHOLDS. BOTH ARE SMALL PROJECTS HAVING AN OUTPUT LESS THAN 15 MW
<b>JHARKHAND</b>	THIS MINERAL AND IRON RICH STATE HAS THREE PROJECTS -ALL RELATED TO WASTE HEAT RECOVERY IN SPONGE IRON PLANTS. ALL THE CDM PROJECTS ARE OWNED BY THREE MAJOR IRON AND STEEL COMPANIES. ALL THE THREE PROJECTS ARE IMPLEMENTED IN THE MOST BACKWARD SARIEKELA DIST OF JHARKHAND
<b>DELHI</b>	TWO PROJECTS. ONE IS THE DELHI METRO PROJECT SUPPORTED BY JAPAN AND THE OTHER IS THE WASTE MANAGEMENT PROJECT. BOTH ARE URBAN BASED
<b>PONDICHERRY</b>	ONLY TWO PROJECTS, ONE ON ENERGY EFFICIENCY AND THE OTHER ON WASTE HEAT RECOVERY. BOTH ARE OWNED BY PRIVATE PARTIES AND USED FOR IMPROVING IN HOUSE CONSUMPTION
<b>UTTARANCHAL</b>	THERE ARE ONLY TWO PROJECTS BASED ON UTILISATION OF HYDRO POTENTIAL. ONE IS LARGE OF ABOUT 22.5 MW WHEREAS THE OTHER IS A SMALL ONE HAVING A CAPACITY OF 4.8 MW. THE ENERGY GENERATED BY TAPPING THIS RESOURCE WILL BE USED FOR MEETING REGIONAL POWER DEMANDS.
<b>ASSAM</b>	ONE PROJECT ON WASTE HEAT UTILISATION BY A PRIVATE COMPANY
<b>SIKKIM</b>	ONLY ONE HYDRO PROJECT OPERATED BY A PRIVATE BODY
<b>GOA</b>	ONLY ONE PROJECT RELATED TO UTILISATION OF FLUE GASES
<b>KERELA</b>	ONLY ONE PROJECT WHICH IS A SMALL HYDRO BASED PROJECT IN THE HILLY REGIONS OF IDUKKI DISTRICT

# SUSTAINABLE DEVELOPMENT AT CDM SITES: INSIGHTS FROM FIELD VISITS

This section focuses on the Sustainable Development objectives achieved by each of the seven CDM projects. We have critically examined and assessed the nature of Sustainable Development achieved against the stipulated indicators of the Designated National Authority.

## CASE STUDIES

The CDM projects that have been studied at site are the following:

- ▶ ITC project on energy efficiency, Khammam, Andhra Pradesh
- ▶ ITC social forestry project, Khammam, Andhra Pradesh
- ▶ Perpetual biomass power project, Vizianagram, Andhra Pradesh
- ▶ Samal hydro project, Angul, Orissa
- ▶ Kolab hydro project at Tentuligumma, Malkangiri, Orissa
- ▶ Kohinoor sponge iron project, Sarekela, Jharkhand
- ▶ Aarti power and sponge iron project, Raipur, Chhattisgarh

The case studies were selected based on various considerations. The first was the geographical location. We focused on the tribal belt. Since there were few registered

projects in the tribal belt of the four states under study the choice of projects was limited. Apart from the geographical representation it was important to consider the big and small projects and project proponents. Various types of projects and technologies were also considered and hence we looked at energy efficiency as well as at renewable energy projects. Two CDM projects of ITC were studied because ITC alone has six CDM projects in Andhra Pradesh and it is the first company in India, which is registered for afforestation/reforestation.

Last but not the least, the relationship with the community of NGOs working in the vicinity was considered as important for approaching and accessing data from the community.



## CASE STUDIES AT A GLANCE

	TYPE	SIZE	PROJECT PROPONENT	NGO CONTACT
<b>ANDHRA PRADESH</b>				
REDUCTION IN STEAM CONSUMPTION AT KRAFT PULPING PROCESS	ENERGY EFFICIENCY	LARGE	ITC PAPERBOARDS AND SPECIALITY PAPERS DIVISION (PSPD), KHAMMAM	MALLUDORA YUVAJANA SANGAM, KHAMMAM
SOCIAL FORESTRY	AFFORESTATION/ REFORESTATION	LARGE	ITC LIMITED, PAPERBOARDS AND SPECIALTY PAPERS DIVISION (PSPD), KHAMMAM	MALLUDORA YUVAJANA SANGAM, KHAMMAM
RENEWABLE ENERGY GENERATION	RENEWABLE: BIOMASS	SMALL 7.5MW	PERPETUAL ENERGY SYSTEMS PVT LTD, VIZIANAGARAM	PARICHAY, VIZIANAGARAM
<b>ORISSA</b>				
MIDDLE AND LOWER KOLAB HYDRO ELECTRIC PROJECTS	RENEWABLE: HYDRO	LARGE 37MW	MEENAKSHI POWER LTD, MALKANGIRI	PARIVARTTAN, MALKANGIRI
SAMAL GRID-CONNECTED HYDROELECTRIC PROJECT	RENEWABLE: HYDRO	LARGE 20MW	ORISSA POWER CONSORTIUM LTD, ANGUL	WOMEN'S ORGANISATION OF RURAL DEVELOPMENT (WORD), ANGUL
<b>CHHATTISGARH</b>				
WASTE HEAT RECOVERY PROJECT FROM SPONGE IRON PLANT	ENERGY EFFICIENCY	SMALL ( 10 MW)	AARTI SPONGE AND POWER LTD, RAIPUR	PARTICIPATORY RESEARCH IN ASIA( PRIA), RAIPUR
<b>JHARKHAND</b>				
WASTE HEAT RECOVERY PROJECT FROM SPONGE IRON PLANT	ENERGY EFFICIENCY	LARGE ( 17MW)	KOHINOOR STEEL PVT LTD, JAMDHEDPUR	ADARSH SEVA SANSTHAN, JAMSHEDPUR

## INDIAN TOBACCO COMPANY (ITC)



ITC FACTORY AT SARAPAKA, KHAMMAM

Reduction in Steam Consumption at Kraft Pulping Process, Indian Tobacco Company (ITC) Paperboard and Special Papers Division, Khammam District.

This unit is an integrated pulp and paper mill and produces high quality paperboards and specialty papers. The main purpose of the project activity is to reduce the GHG emissions caused from generation of steam and electricity using fossil fuels and address other aspects of air and water pollution. This is made possible by applying a new technology which reduces steam consumption for production of pulp

### ENERGY EFFICIENCY PROJECT OF ITC PAPER AND PULP

LOCATION	SARAPAKA VILLAGE, KHAMMAM DISTRICT, ANDHRA PRADESH
NATURE OF PROJECT:	ENERGY EFFICIENCY
SIZE	LARGE (800 BD TPD OF UNBLEACHED PULP PER DAY)
CREDITING PERIOD	10 YRS
ESTIMATED EMISSIONS REDUCTION	478874

for paper processing. The ITC's CDM initiatives are being supported by ABN Amro Bank of N.V. London.

The CDM project emerged as a result of an energy audit undertaken by The Energy Research Institute (TERI). TERI, a premier engineering and research institute in India, conducted energy audit across the pulp and paper mills along with PSPD Khammam energy engineers. The audit identified areas of possible energy savings that required additional investment and adoption of technologies not prevalent in the industry sector.

### BACKGROUND OF ITC

The ITC is one of India's largest conglomerates engaged in tobacco, food and agriculture, paper, packaging, hospitality and information technology. Six CDM projects have been approved with 5 for energy measures and one for a fuel switch to biomass. One additional afforestation/

reforestation project has been initiated as part of a social forestry programme. Adjudged to be the greenest paper mill in India in 2004 by Centre of Science and Environment, New Delhi study due to various energy and water conservation measures at site, it boasts of being carbon positive since 2005 and water positive since 2002.

Since this is a huge corporate organization it was considered vital to study the CDM project of this company particularly from the perspective of sustainable development.

In the case of ITC it was difficult to identify the specific effect of the CDM because the CDM in question formed a small part of the company's overall project on paper and pulp. What we could assess was the specific project which had CDM as a part of their larger project interventions.

### ITC PERSPECTIVE

The officials were proud of the development work in water, education and healthcare undertaken by the ITC. According to them since the plant draws substantial amount of water it was necessary to compensate this loss of water by initiating a water conservation programme. Moreover they shared that all effluents were treated before release. They indicated that in addition free bore wells were dug, and that they have provided 3,00,000 litres of water per day to Sarapaka. With reference to education they had built classrooms, toilets, and hostels and provided benches. In relation to health they

*"ITC is a huge company located in a tribal area. I do not consider this as a job opportunity, it is more like slavery ... A number of surrounding industries have been started, but ITC has not looked after Sarapaka. They are taking away our land, forest and water"(Chandu Naik, Sarpanch, Sarapaka village).*

had provided doctors from the company hospital and conducted health camps in the district with specialists from Visakhapatnam and Hyderabad. Besides, they have funded four NGOs in the region for community development.

### PEOPLE'S PERCEPTION

Focus group discussions (FGD) were held with the community and the ex Sarpanch, the current Sarpanch of Sarapaka and ITC officials were interviewed.

There were differing responses from various sections of the community. Sarapaka village comprises three colonies of Scheduled Tribes (ST), Backward Class (BC) and migrant Oriyas. The BCs were employed directly or indirectly in the ITC plant. They had access to hospital facilities and schools. They were thankful to the ITC at one level but complained about the stench and health problems. The response was overwhelmingly negative in the ST and Oriya colonies.

The STs had very few jobs. It was evident from the people's responses that most of the initiatives taken by ITC have

mostly bypassed the ST Colony. The ST colony is dominated by tribals, who originally owned land around the Godavari river. The colony currently has about 100 households. Their means of livelihood has been subsistence farming and contractual employment. Most of the women are working in limestone quarries located nearby, and it was reported that about only about 10-15 persons have managed to get jobs at the plant.

They have no access to piped water and have to depend on bore wells, which are not working reliably and are insufficient for their needs. The only reliable bore well today was dug by a team from ITC, which visited the colony two years ago. ITC earlier ran a programme where treated waste discharged from the plant was distributed to farmers, including those from the ST colony, to be used as fertilizers. However, these farmers have not been receiving it for the past two years. The community also complained of health problems possibly triggered by the stench emanating from the paper mill.

In the other two hamlets, almost every household has members working on contract with the plant, and contract labour was dominated by the locals. Full-time plant employees, however, were from various parts of the country.

In the case of the Oriya colony, the biggest problem stems from a heavily polluted stream running through the colony affecting human and livestock.

Moreover, ITC had signed an MoU with the State government to spend 10% of their profits for the development of Sarapaka, which evidently has not been the case so far. Also, while the population of Sarapaka has risen significantly, the water supply from ITC has remained the same. Moreover, ITC is unable to supply potable water to the residents. The sarpanch was also concerned that most of the jobs have gone to migrants and not to tribals even though the plant is situated in the Scheduled Area.

Regarding stakeholder meetings, the ex-sarpanch of the village, in charge of village administration, said that she had attended a couple of meetings by the company; however, she did not understand anything as these meetings were conducted in English. She and others had no awareness of the CDM whatsoever.

### **THE PDD AND IMPLEMENTATION**

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The PDD focuses on the technological aspects in relation to avoidance of coal, marginal reduction in energy cost associated with pulp production, the superior technology involved, the project activity leading to enhancement of technical skills and lack of adverse environmental impacts. In fact while ITC may have achieved technological efficiency in their project we had many questions in relation to ITC's effectiveness with respect to sustainable development. It was clear from our interaction with the community that sustain-

### Observations

*The ITC's case questions the commitment of one of the most credible companies of India regarding participation of such corporations in the CDM process. Ensuring social well being with reference to alleviation of poverty by generating additional employment has clearly not been in the best interest of the community as most of the workers are not from the local area but are migrants. Moreover, taking into consideration that the community is mostly illiterate, they are involved, if at all, in menial jobs not free of drudgery. In the context of removal of social disparities, ITC endeavor has actually increased the social disparity by bypassing development initiatives in the ST community. Further, contribution to provision of basic amenities to people leading to improvement in quality of life of people is hardly evident as there continues to be a lack of basic facilities like drinking water, sanitation, etc.*

*The aspect related to 'promoting economic development' in terms of additional investment consistent with the needs of the people has not been addressed so far. Finally, the impact on human health and environment has been negative mostly due to the stench from the factory.*

able development is perceived in relation to enhancement of incomes or basic amenities and hence improvement of their quality of life. From this point of view ITC had failed in ensuring comprehensive sustainable development benefi-

cial to the community. There were issues related to the negligible benefits accrued to the community by way of employment opportunities and role of the ITC in fostering social disparities.

*The ITC through its 6 CDM projects in Andhra Pradesh will earn proceeds from more than 1.2 million certified emission reductions. The Khammam unit alone accounts for 64.8% of the energy consumed by the entire company. If one analyses the financial benefits so accrued to the company vis a vis the local development benefits accrued to the local communities, there appears to be a large gap, to say the least.*



STOCKPILES OF EUCALYPTUS AT THE FACTORY PREMISES

## INDIAN TOBACCO COMPANY (SOCIAL FORESTRY)

### BRIEF DESCRIPTION OF THE PROJECT



EUCALYPTUS CLONE ROOT PENETRATION ON DISPLAY

The ITC Social forestry CDM is over an extent of 3070.19 hectares. This area is spread across all the mandals of Khammam District. Pockets of degraded land spread across the district was identified by satellite imagery (GIS mapping). In addition consultants from the Geological Survey of India and other appropriate institutions of the government were asked to help in the process. Consequently this land has

### REFORESTATION OF SEVERELY DEGRADED LANDMASS

LOCATION OF CDM PROJECT	14 MANDALS OF KHAMMAM DISTRICT
NATURE OF PROJECT	AFFORESTATION/REFORESTATION
CREDITING PERIOD	32 YEARS
ESTIMATED EMISSION REDUCTION	1733753 CERS

been utilized for extensive plantation of a genetically modified fast growing Eucalyptus species. It has been proposed in the project proposal of the CDM that these trees will be cut at the stem 4 times, every 4 years amounting to a total period of 16 years. At the end of this period the tree roots will be removed and then replanted. This process would be carried out once more resulting in a total project period of 32 years (16x2).

### THE PDD AND GROUND REALITIES

According to the PDD the project envisages strengthening of the village level institutions, such as the Mandal Samakhya, towards empowering the poor and the deprived. The present project activity would result in the alleviation of poverty by generating additional income from the proceeds of the wood sale. The initiatives by ITC to share knowledge and assist the farmer with agricultural/forestry practices would enhance the income generation capability of the farmers and thus lead to improvement in livelihood

generation of the farmers. The plantations once established, would act as a carbon sink. In addition, the plantation would also act as a man-made green belt and bring about gradual environmental improvement to the region. Further, as the project activity is undertaken on degraded land, the plantations would help control soil erosion, which in turn would improve soil and vegetation cover in the region. The present activity uses clonal technology, which is said to be environmentally sound and cost effective. The local tribal communities, who lack the technological expertise, are expected to harness information and knowledge and gain benefit from the degraded land by using this technology. The proposed activity based on clonal technology is intended to foster continuous improvement in productivity.

The Mandal Samakaya we visited in Velugu Mandala Samakya, Mulkalapalli indicated that the ITC had sought their assistance to identify communities interested in growing eucalyptus in their fields. The Community Coordinator (CC) informed us that ITC had designated one of their staff for this purpose. After the farmers were identified apparently they have not had any further contact with ITC. When we broached the subject of CDM they expressed ignorance. The farmers in Pillavagu, Maralaguppa, Koya Gumma villages mentioned that attempts had been made to organize self-help groups among the farmers. This was carried out by some of the NGOs working directly under the support of ITC. The farmers have been issued passbooks to

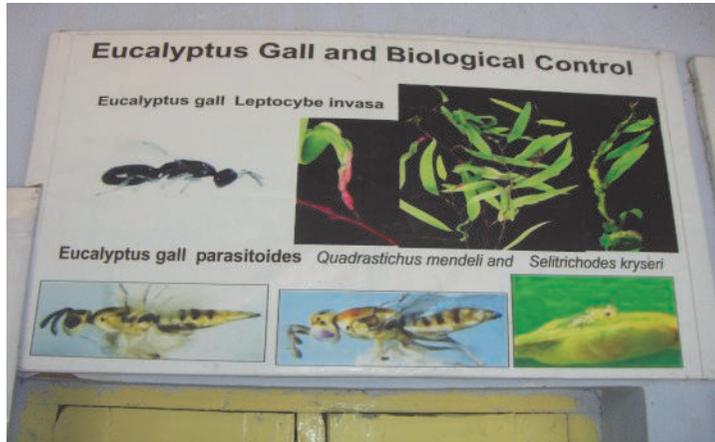
record transactions of the sale of eucalyptus trees.

Almost all the farmers clearly mentioned that they had purchased the eucalyptus saplings. Although in some cases we were informed that ITC had given the saplings on credit and then deducted the cost of saplings (about Rs 3/- to 4/-) during the sale of the trees on maturity. Also in some cases they had facilitated the clearing and ploughing of the fields free of cost.

In all cases, however, we were informed that the land utilized for the plantation was previously cultivated with food crops such as tubers, maize, millets, cowpea, etc. This used to fulfil some of the basic nutritional needs of the community although they were not very economically beneficial. The farmers indicated that they were earning more money now from eucalyptus but were not self-sufficient in terms of food.

Eucalyptus ensures a lump sum of money (about Rs 1750/tonne/acre) once every 3-4 years (as reported by the farmers) and offers a promise of considerable income. However, as most of the farmers are illiterate and don't have a perspective or habit of thrift, they end up spending all the money and then are forced to cut down the trees much earlier than the stipulated period.

Apart from food security the issue is also of price of the eucalyptus trees on maturity. ITC claims that the farmers are



THE PEST AND THE POTENTIAL SOLUTIONS

free agents of their farms. We were informed in one of the villages that indeed there was another buyer earlier (now apparently no longer operative). However, in terms of convenience (transportation and contact) ITC remains the only plausible buyer of eucalyptus.

The definition of what is degraded land is rather technical and is generally understood to be land that is financially unviable (Cited from Approved Afforestation and Reforestation Baseline Methodology AR- AM0001 [version 3] section 2, 4 procedure for selection of most plausible baseline scenario: Step 2)

Also crops that were grown previously absorbed less carbon than what could be estimated from fast growing eucalyptus.

*The calculations may suggest otherwise, but with fast growing eucalyptus it is hard to understand how periodic felling of trees for economic development of tribal communities in a manner that is alien to them would be beneficial as a carbon sink. On the issue of bio-diversity we were told that ITC was promoting mixed cropping of other food growing species with the eucalyptus. However, none of the farmers or the farms we visited verified this. As we travelled along the way to the company all we saw was acres and acres of mono-culture plantations of eucalyptus.*

However, from an environmental perspective this still negates the issue that once the tree is cut it becomes an emitter not a sink.

This clonal technology being environmentally sound is not without side effects. Some of the farms we visited were infected by a peculiar pest that was alien to the region. This pest has stunted the growth of the trees. The officials indicated that ITC was aware of the issue and are concerned. Then to make matters worse ITC has identified another foreign insect that would prey on this pest. This would entail introducing another foreign species to deal with a foreign problem with previously unknown ecological side-effects ecologically. Needless to say this has not been mentioned in the PDD.



## PERPETUAL BIOMASS POWER PROJECT



THE POWER PROJECT AT WORK

The project activity aims to utilise surplus biomass residues such as paddy husk, jute sticks, woody biomass and other crop residues namely rice husk, bagasse and juliflora to generate electricity for a grid system owned by the state owned power utility, APTRANSCO. Perpetual Energy Systems Private Limited has a primary business mission of pioneering the utilization of low-density crop residues, which are otherwise burnt on the fields (leading to high particulate emissions and environment pollution) or allowed to decompose (leading to methane emissions which are potent greenhouse gases contributing to climate change). Being predominantly an agricultural based economy, the region

### PERPETUAL ENERGY SYSTEMS PVT LTD

LOCATION OF THE CDM PROJECT	APAYAPETTA VILLAGE, SEETANAGRAM MANDAL VIZIANAGARAM, ANDHRA PRADESH
NATURE OF PROJECT	RENEWABLE (BIOMASS)
PROJECT SIZE	7.5 MW
CREDITING PERIOD	7 YRS
ESTIMATED EMISSIONS REDUCTION	112367 CERs

where the project is being operated is rich in biomass resources.

### WHAT THE PDD SAYS

Considering the adequate availability of biomass in the agricultural belt of Vizianagaram, the PDD proposes to use each of the three primary fuels (rice husk, *Prosopis juliflora* and bagasse) claimed to be abundantly available for four months consecutively in a year to feed into its production plant. The PDD also lays down that the company will encourage energy plantations to ensure sustained source of raw material supply. The question that arises is why should energy plantations be promoted when it is being claimed that the area has abundant biomass within 25 km of the plant? This was investigated during the field visit.

### PEOPLE'S PERCEPTION

Plant employees, fuel wood suppliers, the Panchayat sarpanch, and representatives of the local community were interviewed. While the Sarpanch did not recall knowing

about CDM, he did remember that he did not raise any questions during the stakeholder meeting. The only issue ever encountered involved the generation of dust as part of plant operations, which had been resolved by the time of the interview. More than 300 daily wage labourers from the village had been employed directly by the plant, which has led to a positive image for the unit.

On the face of it, it appeared that the project to some extent provided employment opportunities and had little negative environmental impacts due to CDM as it is a small scale project. The fly ash generated is transported to brick manufacturers as raw material, and does not require disposal.

A deeper analysis however indicated new insights:

From the perspective of the community, very little agricultural outputs actually go waste. For example, rice husk is used as a low-cost fuel in cottage industries and as manure. Woody bio-mass is used for cooking. The use of these for power generation actually deprives the local community of resources forcing them to go in for higher cost alternatives.

This project presents a clear violation of the PDD which claims that the project is completely dependent on the so-called agricultural waste byproducts. The major issue with this project is that the fuel mix proposed in the PDD was no longer being used. The PDD mentions three such fuels to be used, namely rice husk, bagasse and *juliflora*. The project proponent was unable to encourage the production of *juli-*

*It is a serious matter that the project has escaped DOE attention despite the fuel mix changing from what was specified in the PDD, which could lead to a different sustainable development outcome from what was envisaged. The assumptions underlying the treatment of such 'waste to electricity' projects need to be rethought before granting approval to more such projects. The local community, however, is satisfied with these projects due to the very obvious economic benefits derived from having such a plant operate in their region.*

*flora*. Instead the fuel used was *casuarina* wood, which is not even mentioned in the PDD. More than 70% of the fuel requirements were being met through *casuarina*.

The company provided incentives to cultivate *casuarina*. Hence, several farmers converted their lands from food crops to *casuarina*. This meant long term losses in food security. This is a common story in most rural areas evident in this CDM project as well. This kind of loss strikes at the root of sustainable development by discouraging the cultivation of food crops.



## SAMAL HYDROELECTRIC PROJECT



SAMAL HYDRO ELECTRIC PROJECT POWER HOUSE, KULEI VILLAGE, ANGUL

### BRIEF DESCRIPTION OF THE CDM PROJECT

The purpose of the Samal Hydroelectric Project is to generate electricity using hydro potential available in the existing Samal Barrage and to export the generated electricity to the state owned power utility company, Power Trading Corporation of India Ltd. (PTC). The powerhouse comprises five 4000 KW 'S' type Kaplan Horizontal turbines coupled with synchronous generators. The generation voltage at the terminals is intended to be 11 KV, which will be stepped up to 132 KV to match the grid voltage level. The OPCL entered into a

ORISSA POWER CONSORTIUM LIMITED (OPCL)	
LOCATION/IMPACTED VILLAGE	KULEI, ANGUL DISTRICT, ORISSA STATE
NATURE OF THE PROJECT	RENEWABLE (HYDRO PROJECT)
SIZE	20 MW
CREDITING PERIOD	10 YRS
ESTIMATED REDUCTION	1,067,895

Power Purchase Agreement with PTC, which will sell the power to West Bengal.

### PEOPLE'S PERCEPTION

Interviews were carried out with the secretary of the trade union, ex-sarpanch, current sarpanch, contractors, suppliers, village elders and community representatives, who had attended stakeholders' meetings. They shared the entire process of land acquisition and their involvement in construction of the Samal hydro electric plant. They also shared with us a copy of the Memorandum of Understanding (MoU) drawn between the VDC and the company. They said that a legal framework was signed between the company and the VDC (village development committee) of Kulei village before commencement of the project. The MoU states obligations and promises of the company towards bringing development in lieu of the land acquired from the community. Re-counting the timeline the community representatives high-

lighted the following mentioned in The MoU:

- ▶ 13.02.2005- OPCL acquired 18.50 acres of land for setting up the hydro power plant at Gram Kulei;
- ▶ OPCL promised all facilities for 40 affected families whose land was acquired for the power plant;
- ▶ Employment for the families as per eligibility required for temporary/permanent staff. If such numbers are not available in the village then company would hire workers from other villages. Village committee was empowered to decide engagement of manpower/regulate employment as vacancies arise;
- ▶ OPCL categorically committed tap water for the adivasis;
- ▶ Renovation of the village meeting place, repairs of the village temple;
- ▶ Developing proper drainage system;
- ▶ Experienced contractor from the village will be given preference for offloading work of OPCL;
- ▶ If excess of land is required then depending on the discussion between OPCL and village committee, future action would be taken;
- ▶ In case of any violation of the above, VDC may take action.

#### OTHER PROMISES MADE

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- ▶ Landscaping, leveling of area, proper disposal of construction waste;

- ▶ Accommodation of employed labourers in temporary shelters;
- ▶ Drinking water and sanitation facilities for skilled and unskilled labourers at the permanent colony to be set up;
- ▶ Sanitation facility with septic tanks;
- ▶ Ensuring no direct drainage to the river.

#### COMMITMENTS IN THE PDD

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In addition, a large number of promises have been made in the PDD relating to alleviation of poverty by generating direct and indirect employment during construction of the project as well as during operation. The labourers would be supplied with free fuel by the contractor/developer to avoid cutting of trees from the adjoining area. Health care for the employees will be attended to at the project hospital existing in the Samal barrage township within 1-2 km distance from the project site and at the three health centres existing in Kanhia Block. The PDD also states that the project would bring in additional investment to the region. This would result in infrastructure development, which ultimately would lead to rural development and prevent the migration of rural poor to cities. Furthermore, since the project utilises hydro potential available in an existing barrage for power generation, the project does not lead to any GHG emissions and cause no negative impact on the environment.

The community however had a different story to tell. They said that:



- ▶ No permanent job was given to a single person from the village;
- ▶ No supply of fuelwood to the community/labourers. (Presently the community purchases 2-3 quintals of coal at Rs 300 per month to meet their fuel requirements);
- ▶ No health facilities are available (they have to travel 14 km by bus to avail hospital facilities);
- ▶ No development of any kind of green belt either around the power house or around the colony/township;
- ▶ No drinking water facility developed. Septic tanks, etc., not developed;
- ▶ Temple not constructed (the trade union constructed the existing temple);
- ▶ Proper road and drain not constructed (existing road in the village was made as part of the Pradhanmantri Gram Sadak Yojna).

The region is full of industries. In fact, Angul is one of the industrial hubs of the state. Most of the people have some or the other job in the surrounding industries. Hence, the big investment being claimed by the company is meant to earn profits by the company itself. The community stands to gain very little from the investment. The community is in fact paying the price of development by losing their land and resources.

There is no mention of how the project impacts resource

### Observations

*Taking into consideration the absence of detrimental environment impacts in this project this case revealed the importance of CDM only for renewable technologies. The issue of employment in lieu of land was of a greater significance for the community. The community in this village is quite aware of its rights and is fighting for the same. They have involved the administration in resolving the case. For example, letters have been sent to the Collector, SP, District Labour Officer, Police station, etc., to bring the issue to light. It will be interesting to see how the case unfolds and what is meted out to the community. Moreover, the objective of such projects needs to be questioned in terms of exploiting local communities thereby depriving them of benefits, which are accrued to external regions (in this case W. Bengal).*

sustainability and resource degradation, which needs to be articulated. The construction of the hydro project has led to felling of trees and widening the river. This has severely impacted the biodiversity in the area.

Certainly, the objective of using irrigation water for hydro power generation is a good idea as long as the project is small. Unlike in Samal where the irrigation channel has been lying incomplete since the last 6 years. Replication of such projects is challenging because of time taking institutional barriers required for clearance of hydro projects. This project took almost eight years for getting departmental clearances.

## MIDDLE AND LOWER KOLAB HYDROELECTRIC PROJECTS



HYDRO POWER STATION TENTULIGUMMA (25 MW)

### BRIEF DESCRIPTION OF THE PROJECT

The main purpose of the project activity is generation of electricity using hydro potential available in two run-of-the-river hydroelectric projects with capacities of 25 MW and 12 MW on the river Kolab in Orissa state of Eastern India. The electricity thus generated will replace an equal amount of coal which was used otherwise to supplement the grid. The electricity generated is for the West Bengal State grid system through the PTC India Ltd.

### MEENAKSHI POWER LTD

LOCATION OF THE CDM PROJECT	VILLAGE TENTULIGUMMA IN THE KORAPUT DISTRICT AND VILLAGE UDEGIRI, MALAKANGIRI DISTRICT, ORISSA
NATURE OF PROJECT	RENEWABLE (HYDRO)
SIZE	37 MW
CREDITING PERIOD	10 YRS. (2007-2016)
ESTIMATED EMISSION REDUCTION	1,192,240 CERS

### PEOPLE'S PERCEPTION

Focused group discussions (FGD) and informal meetings were conducted to understand people's perception about the impact of CDM project. On questioning, the male and village youth of Tentuligumma recounted that the CDM project got local Panchayat clearance before its commencement. A public hearing was organized on 17.4.2001. They said that the clearance was obtained on the pretext of various promises made by the Hydro power Authority:

- ▶ Providing street light to the village;
- ▶ Provide free electricity supply to panchayat office;
- ▶ Construction of temple in the panchayat;
- ▶ Provide job opportunity village youth;
- ▶ Construction of community hall for the panchayat village;

No.	PROMISES TO THE COMMUNITY & IN THE PDD	STATUS/REPORT CARD
1	EMPLOYMENT GENERATION DURING CONSTRUCTION PHASE (AROUND 2 YEARS)	200 FAMILIES
2.	FREE ELECTRICITY SUPPLY TO PANCHAYAT OFFICE	X
3	STREET LIGHTS (AS PART OF MEETING POWER REQUIREMENTS OF THE REGION THROUGH SUSTAINABLE ELECTRICITY GENERATION)	X
4	TEMPLE CONSTRUCTION	IN PROGRESS
5	JOB FOR VILLAGE YOUTH (PROVIDE PERMANENT EMPLOYMENT TO 60 SKILLED AND 60 UNSKILLED)	12 YOUTH DEPUTED AS SECURITY GUARDS
6	VILLAGE COMMUNITY HALL CONSTRUCTION	IN PROGRESS
7	PARK	X
8	MINI HOSPITAL	X
9	VETERINARY DISPENSARY	X
10	SPECIAL HIGHER EDUCATION FACILITIES	PROVIDED 2 TEACHERS TO SUPPORT GOVERNMENT TEACHER
11	WATER SUPPLY	TO TENTULIGUMMA ASHRAM SCHOOL ONLY
12	POST OFFICE	X
13	CONSERVATION OF FOSSIL FUELS (REDUCED USAGE OF FOSSIL FUELS)	X

- ▶ Park for panchayat village;
- ▶ Hospital, Veterinary dispensary;
- ▶ Special higher education facilities for children; and
- ▶ Water supply to panchayat.

### COMMITMENTS IN THE PDD

According to the PDD the proposed project activity would have several positive impacts for sustainable development such (PDD);

- a. Employment generation during construction of the two power plants for over 750 persons for a period of 18 to 24 months;
- b. Generation of permanent employment during operation lifetime of the two projects: permanent employment for over 60 skilled persons and an equal number of unskilled persons;
- c. Rural infrastructure development such as creation of roads, establishment of schools and other civic amenities such as medical facilities, post office, etc;
- d. Meeting the power demands of the region through sustainable electricity generation;
- e. Installation of tube wells to meet the drinking water requirements of the people;
- f. The project will also cater to the education and health facilities for the local villagers;



FLOW OF WATER AFTER USED INTO MAIN RIVER

### **Observations**

*The hydro project has done some good for the community in terms of generating employment for about 200 families during its construction phase. They have developed better roads and communication facilities and have provided limited employment on a permanent basis. The community in this case did not have to part with any of their lands as the power house under this CDM has been built on a government forest land. However, there has been destruction in terms of depleting agricultural productivity due to quarry dust, metal pieces, chips, etc., which has accumulated in the agricultural fields close to the construction site. This would imply that whatever earnings were made by the community during the construction phase will be undone with the depleted agricultural produce.*

- g. Conservation of depleting fossil fuels such as coal, oil, natural gas which at present are predominantly used for power generation and hence reduction of greenhouse gases and air pollutants (especially NO<sub>x</sub>, SO<sub>2</sub>, particulates) from combustion of fossil fuels.

The status report tells us of the actual situation, which we learnt from the community representatives. What is evident is the wide gap between the claims made in the PDD and the real situation on ground.



INTERVIEWING THE SARPANCH (LEFT) AT UDEGIRI VILLAGE

## WASTE HEAT RECOVERY PROJECT



FLY ASH MOUND IN KUCHIDIH VILLAGE JUST OUTSIDE THE FACTORY

### BRIEF DESCRIPTION OF THE PROJECT

Kohinoor Steel Pvt. Ltd. (KSPL) has installed a 10MW Captive Power Plant (CPP) for generation of electricity by utilizing sensible heat of waste gases emanating from the Direct Reduction Iron (DRI) Kiln. DRI Kiln emits large quantities of hot gas at high temperatures, containing heat energy which, under normal circumstances would go as waste. The project proposes to use the waste heat by installing Waste Heat

### M/S KOHINOOR STEEL PRIVATE LTD.

LOCATION OF CDM PROJECT	VILLAGE KUCHIDIH, SARIEKELA DIST, JHARKHAND
NATURE OF PROJECT	ENERGY INDUSTRIES
PROJECT SIZE	17 MW
CREDITING PERIOD	21 YRS (7X3)
ESTIMATED EMIS- SION REDUCTION	393,235 CERS

Recovery Boiler at the tail end of each DRI Kiln. Heat that is extracted from the hot gas is used to transform water to high temperature high pressure steam. This steam is used to run conventional condensing type steam turbo-generator (with steam dumping facility) for the generation of electricity.

### THE PDD AND THE REALITY SITUATION

The PDD states that significant employment opportunities directly by way of manpower required to build/operate/maintain the unit, and indirectly by generating power would be created. Further, with growing technological advancement, the project activity would contribute to the capacity building in terms of technical knowledge and long-term skills. Such a project, involving energy efficiency, according to the company would have long term direct and indirect

***Our Experience with Kohinoor... dark and dirty!***

*As part of this study, visits were made to the village of Kuchidih impacted by Kohinoor's CDM project. In one of our visits our experience can best be termed as intimidating, scary and at the same time 'eerie'. During the process of interviewing the community about their perceptions relating to the project and the company we were requested by the General Manager of the Company to meet him. At this meeting we explained the purpose of the study and the reason for interacting with the community members, but he somehow seemed quite alarmed. We learned that the company was keeping a regular tab on our team's whereabouts. The community representatives were also chastised for cooperating with us for the study. We received indirect indication from the company to leave the place immediately. When we did not, we were faced by a bunch of armed 'policemen'; we assume they sent by the company, who sternly cautioned us to leave the village for our good. Our details were taken on the pretext of protecting us from the 'naxalites' quite active in the area. Subsequently telephone calls were made to the Laya office enquiring about the video film.*

social benefits. The implementation of the project activity would bring about an increase in the business opportunities for contractors, suppliers, and erectors at different phases of its implementation. This would improve the local economic structure and hence social status of the 'involved people'.

Furthermore the proposed waste heat recovery CDM project will displace or replace the equivalent quantity of electricity generated in the grid. Since the project is able to avoid all the associated pollution occurring related to extraction, processing and transportation of natural resources, it promotes an overall environmental well-being. Apart from this the project is also expected to help in eradicating the local air pollution. (PDD)

**Employment situation**

The reality situation indicates that employment is given primarily to outsiders from Orissa and Bihar states and certainly not the local community of Kuchidih. Contractors are local but mostly not from the village. Some youth are employed but get very poorly paid in comparison to outsiders (the villagers are hired by the contractors on daily wage in most cases-flouting daily wage rules). The company no longer hires women from the village. The workers reported that company does not maintain occupational health and safety standards. They are provided head gear and boots only when there is an inspection. It was reported that some of the youth from adjoining villages have lost their body parts, and the company has granted no compensation package for them as they are were not on the company's permanent rolls. The crane operator is from the village and says that he works 12 hours a day and is paid only Rs 3000 in comparison to an outsider who operates the



### Observations

*Kohinoor is doing very little on its part to address sustainable development issues. On the contrary, it is harassing the community to an extent that the people are scared of demanding for their basic human rights. There is also no grievance redressal system as the company is hands in glove with the local police and administration, who turn a blind eye to the people's complaints.*

*The environmental well being is simply not being considered. The carbon/smoke deposits from the company have settled everywhere rendering everything toxic. There is a 4 inch smoke deposit on the roof of huts and school roof. The dust has disturbed the local biodiversity in terms of losing certain culturally valuable plant species. The adjoining forests are gradually drying up because of the intense heat. There have been instances where wild animals have come to the villages in search of food (forests no longer provide them with edible items because of smoke deposits) and have attacked people.*

*While the proposed technology may be more efficient but certainly not environmentally clean. It was reported that bag filters (to reduce carbon pollution) are put in the day and taken out at night.*

*In a word, the company's presence has led to pauperization of the local communities.*

*"There is no work for us in the factory. The company hires people from outside. We are forced to work in glass factory or other civil construction works in nearby towns for our living. Neither the administration nor the company is responsive to our problem. They have taken it all from us. We have no idea what to do now...Kohinoor is flourishing... grabbing community lands and snatching away livelihoods".*

crane for the other 12 hours earning Rs12,000. This disparity defeats the very objective of ensuring social well being.

### Loss of Land

There is little more cash than before but no land. The land was sold at a pittance. The community said that they were duped by the company as they had to sell their agricultural land at the rate of Rs 18,000/acre in 2004-2005. During the meetings people shared that earlier, the land was sufficient for taking care of livelihood needs, which is no longer the case now. Before, there was no need for migrating out of the village. The land produced enough and a little surplus was sold for cash.



FLY ASH/COAL DUST SETTLED ON THE LEAVES OF MANGO TREES

### Depletion of livelihood resources

The discussions with community representatives indicated that smoke and dust from the plant has resulted in depleting livelihood resources primarily mahua, lac and kendu leaf, which had been sustaining them for ages. Fisheries which had a thriving production is now lost. Carbon has settled on the pond bottom which has depleted the pond productivity. Flowering of mango has visibly reduced. NTFP collection from the adjacent forest is no longer a way of their life. Bidi leaves are gradually disappearing. There is loss of pasture land and livestock. Paddy production has almost halved to an extent that it cannot

suffice for the entire year.

### Health services

Seva Kendra, a primary health centre to take care of health issues of the community, is established but it remains locked most of the times. The doctor who sits there thrice a week does not have medicines to dispense. Hence, the facility lies defunct and the community has to travel 14 km to avail health care services.



WOMEN OF KUCHIDIH VILLAGE

## AARTI SPONGE AND POWER LIMITED



AARTI SPONGE IRON PLANT

### BRIEF DESCRIPTION OF THE PROJECT

ASPL has proposed to generate electricity by using waste heat contained in the waste flue gases released from 2 ABCs (After Burning Chambers) from 2 Direct Reduction Iron (DRI) sponge iron kilns of 100 TPD kiln each. The heat contained in waste gases will be transferred to water, which converts water in to steam in 2 Waste Heat Recovery Boilers (WHRB). The purpose of the project activity is to achieve better energy efficiency, achieve sustainable development in the industry and improve the working environment of sponge iron-making process. The power so generated shall be used

### AARTI SPONGE AND POWER LIMITED (ASPL )

LOCATION OF CDM PROJECT	VILLAGE MURETHI, SILTARA, RAIPUR
NATURE OF PROJECT	ENERGY EFFICIENCY
PROJECT SIZE	10 MW
CREDITING PERIOD	10 YRS.
ESTIMATED EMISSION REDUCTION	312090 CERs

to meet the captive power requirement of ASPL Plant itself. In case of surplus, power will be exported to the Chhattisgarh State Electricity Board (CSEB) grid.

### SPONGE IRON PLANTS IN CHHATTISGARH

Chhattisgarh State Industrial Development Corporation (CSIDC) has developed industrial growth centres - one of them being Siltara (Raipur), where the study has been conducted. The Siltara Growth Centre is 13 km from Raipur on National Highway 200. It has an area of 1291 hectares.

In Chhattisgarh, Raipur and Raigarh have the maximum number of sponge industries. Norms to establish sponge industries is not followed. The most common flouting is the close establishment of factories. The State of Environment Report Chhattisgarh 2005 says that about 65% of the industries in the state fall under the red category.

Siltara Phase 2 has about 55 sponge iron plants. A few of



A SIGN BOARD SHOWING THE LOCATION OF 50 ODD COMPANIES IN SILTARA INDUSTRIAL AREA

them are operational under the CDM mechanism.

### PROCESS OF LAND ACQUISITION

Visits were made to village of Murethi and Sondra. Group discussions and community meetings were organized with women groups, young supervisors, hotel owner of Murethi village, coal truck drivers from the village to get an understanding of the ground realities. They said that most of the sponge iron units in the State have been established by strategically acquiring land from the native communities. ASPL has taken land from two villages: Murethi and Sondra. About 30 acres of land has been taken from Murethui and

some part from Sondra village. Six years back Rs 2,00,000 per acre was the price paid. It will be interesting to learn about the approach taken by the company to acquire land. The company sent contractors who convinced the person, who had the maximum amount of land in the company premises. Thereafter the contractor compelled/threatened the rest who had small bits of land to sell it to the company as the company would border it and entry would be forbidden (implying that the community will lose their piece of land). The contractor fixed the price of the land. He never provided anything in writing since this is a non-tribal land, the land could be sold unlike tribal lands, which cannot be sold.

The community representatives said that there was no commitment whatsoever made by the contractors/company during land acquisition. The deal was simple. "You give me land, I give you the money" said Guharam from the village. It is to be noted that the contractor did not convene a group meeting to discuss the issue among the community but went house to house (thereby not allowing community to decide the issue together).

### SUSTAINABLE DEVELOPMENT

According to the PDD the project activity will lead to sustainable development and promote sustainable industrial growth by promoting technological excellence, conserving natural resources and preventing the thermal

pollution even though no such statutory requirement exists. CSEB has projected power deficiency in the state between generating capacity and demand and supply of electricity from grid; leading to import of electricity from central grid and other sources. Hence, the project activity contributes in reducing this deficit. This enables the CSEB to satisfy more consumers leading to more employment for skilled and professional people in the state. The project activity according to the PDD will also increase the employment within and outside the company for skilled manpower and professionals as well as for semi skilled and unskilled manpower. The state will generate revenue out of the manufacturing activities, supported because of this captive

power generation by way of taxes and cess, etc. Moreover, the waste heat recovery CPP in ASPL will displace/replace the coal based AFBC captive power generation, thus saving further depletion of natural coal reserves. Since the Project activity uses waste heat recovery from flue gases it effectively avoids thermal pollution.

As is clear the company commits to 'sustainable industrial growth'. From this it can be inferred that sustainable development of the community is not on their agenda.

#### PEOPLE'S PERCEPTION

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##### Land and agriculture loss

The majority of the village people have lost their land and now work as daily labourers in one of the companies around. Most of these companies have come up only in the last 7-8 years. Most of them have sold their land to some or the other company in the neighbourhood. When queried as to why they sold off their entire land, in most cases, they said, that there was no reason in retaining any piece of land, which turns unproductive with existing pollution and toxicity level.

A small number who still have some land left, said that the paddy production has almost halved. Moreover whatever is produced has very little market value (owing to the black colour of the grains). Such produce when consumed have resulted in health problems/other unknown ailments. Before



WATER FOR THE COMPANIES NOT SHARED WITH THE COMMUNITY

*The impact of sponge iron plants are known to all. This case is no different. The companies say that “land lost is job gained”- sadly this is also not the reality. However the question that arises here is whether the CDM mechanism should promote such unsustainable industries? One important observation here is, that unlike in Jharkhand, this community valued land in a different manner - as a source of income. The tribals of Jharkhand valued their land as a way of life. Whatever be the case, the communities have been duped by the company to part with their land, which has led to impoverishment of these communities. In this light it is important that the CDM which has an objective for ensuring sustainable development should strictly not promote such initiatives.*

the company came the community cultivated a variety of pulses which they said is not possible to grow now. “There are also limited means of irrigation”. This is in contrast to a large reservoir/dam that has been constructed by three companies together to feed into their sponge iron units. The company does not share the water with the locals. “Its an irony that the outsiders are using our village water resources and not letting us touch it” said Anuj, a young supervisor.

### **Employment situation**

The company does not recruit local persons. It outsources the recruitment process to contractors. The community

reported that the contractors get ‘Biharis’ and ‘Mandwas’ from across the border but do not take labourers from the village. This they said was a comfortable and efficient arrangement for the contractors as the labourers are made to stay in makeshift hutments very close to the factory. This proximity enables the contractors to call the labourers even during ‘off working hours’ which would not have been the case with local community. Also outsiders work 24-36 hours which the local would not have done in any case”.

### **Pollution**

Pollution in Siltara has taken a heavy toll. Due to excessive smoke, production of rice has been affected (black colour), the one-acre of land, which used to produce 15-20 bags of rice, has been reduced by 4-5 bags, and contamination of water has resulted into scarcity of drinking water.

### **Health**

“The companies have not done anything for us”. For availing health services we travel to “Dharsima” which is 7-8 km from the village. The incidence of cough and new diseases have increased since the area came up with these many industries eight years back.

### **Local politics**

It was understood that the Company provides some money to the Panchayat as and when there is demand. However,



FALLEN COAL FROM TRUCKS BEING PICKED UP BY THE LOCAL COMMUNITY FOR FUEL



COAL AND COWDUNG MIX BEING DRIED FOR FUEL USE

the role of Panchayats was questionable as they did not use the money for the common village cause but filled in their own pockets. The flamboyant pucca houses of the Sarpanch in the village stood testimony to this reality.

When we questioned the General Manger of Aarti regarding the sustainable development initiatives, he named a couple of their initiatives with respect to plantations, clean water availability for bathing, making boundary wall, and support during festivals, etc. There was no understanding on the CDM process whatsoever.

### **The vicious cycle**

In some of the meetings with General Manager of the Sponge Iron Plant it was understood that the local elected

representatives and state level environment governance bodies like the Pollution Control Board, Impact Assessment Group coerced the companies to shell out large sums of money. "This has become our culture now - we cannot deny it" said one of the company officials. In turn the company flouts environmental norms and other regulations. Further, even though the company has got environment clearance from the environment governing bodies, yet there is no monitoring of the company.

The next section discusses the overall insights gained from the desk study as well as the field visits and proposes suggestions for a CDM framework that takes into account the sustainable development needs of the marginalised majority.

# CDMs: CONCLUSIVE INSIGHTS AND RECOMMENDATIONS

## THE CONTEXT:

The CDM has the twin objectives to achieve Sustainable Development (SD) in developing countries where the projects are initiated and assist developed countries in achieving their emission reduction targets in an environment friendly and cost-efficient manner.

The Indian Government is promoting the CDM in its current form as it is a lucrative source of funds for the country. Given that sustainable development is one of the key objectives of the CDM and that a large majority of the projects are undertaken by private companies, the question that arises is whether these companies, deriving benefits from the CDM are involved in sustainable development of the local communities where the project operates? This study has examined in particular the nature of sustainable development addressed by CDM projects in India. It examines and interprets people's perception on CDM projects and presents significant policy recommendations necessary if CDM projects are to achieve sustainable development obligations.

The study hence undertook a desk study through a content analysis of Project Design Documents of 353 projects

registered under the UNFCCC and a site analysis of 7 CDM projects across the tribal belt of 4 states: Andhra Pradesh, Orissa, Jharkhand and Chhattisgarh based on geographical location, typology, size and background of project proponent.

The following are the conclusive insights gained from the study:

## THE MACRO PARAMETERS

- ▶ CDMs are not evenly spread across the States. States like Maharashtra, Karnataka and Andhra Pradesh have more than 40 CDMs while states like Jharkhand, Assam, Goa, Kerala, Bihar and Sikkim have a maximum of 3 CDM Projects. Further, there are very few CDM projects in tribal areas.
- ▶ Based on the UNFCCC definition on size of projects, 35% are large and 65% are small. Yet, an analysis of the small project itself is as much as 15MW. The smallest is as much as 6MW. The question is that the definition of small seems to exclude 'micro' community based projects. Such small categories of projects would perhaps need a special status where the priority for sustainable development must be as crucial as reduction of emissions.
- ▶ The typology of projects indicates that biomass projects are in a

significant majority comprising about one third of the total projects. This has implications for the vast rural majority, who are often dependent on biomass for their livelihood. This has to be considered when planning biomass projects. Interestingly solar has hardly been accessed which is perhaps related to its cost effectiveness. Considering that solar energy is abundantly available, solar based CDMs could be real options for the future. Hydro has been accessed, but it is important to note that large hydro projects especially tend to displace communities. The energy efficiency projects, if based on polluting technologies, suffer from the same environmental dangers with or without CDMs. The question to be considered here is that if CDMs are a means to an alternative paradigm then should known polluting industries be excluded from the ambit of CDM.

- ▶ The government involvement is still insignificant. Civil society engagement is hardly evident. Almost all the projects are in the hands of private players. The larger players have multiple CDM projects. It stands to reason that the *raison d'être* for private parties is the profit motive. The question to be asked here is whether strategic choices by way of creating a niche for the non-profit sector is required in order to ensure development while we pursue a low carbon pathway to development.

## INDICATORS OF SUSTAINABLE DEVELOPMENT

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- Government Indicators for Sustainable Development are vague: The Government of India's indicators are very broad and hence vague. None of the indicators state specific parameters which

are quantifiable, deliverable and verifiable. This has led to a lax attitude and lip service to sustainable development. There are no carefully designed indicators for project proponents to follow. Nor are compliance measures in place.

- ▶ **Discrepancy between Government of India's indicators of Sustainable Development and Project Design Documents:** The articulation of Sustainable Development in almost all the PDDs are unclear and overlook the components that need to be fulfilled under each of the four indicators: social, economic, environment and technological well being stipulated by Designated National Authority. What was clear from analysing the PDD document is that indicators of the PDD did not match with the indicators set by the Government of India. This has resulted in dilution of the indicators of sustainable development at the first stage itself. This also indicates the failure of the DOE within the CDM structure to overlook these discrepancies.
- ▶ While there is data on reduction of emissions there is no data available on extent of sustainable development achieved. If sustainable development has to be taken seriously then mechanisms to develop indicators to measure this aspect needs to be put in place.

## MICRO LEVEL INSIGHTS

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- ▶ **Most projects violate promises made for sustainable development:** On the ground, almost all the projects studied have neglected the aspect of encouraging sustainable

development. In certain cases, the CDM is further threatening the livelihood security of the local communities.

- ▶ **Some projects have negative environment impacts threatening livelihood:** The cases of sponge iron plants validate this point. Kohinoor and Aarti to a large extent presents enormous negative impact on the livelihoods and not only the environment but the entire ecosystem. This is serious matter for consideration.
- ▶ **Acquisition of land at low prices with little economic returns:** Land alienation from the tribals and land acquisition from the other deprived communities is evident across the board. Ignorant communities have been duped and cheated to give away their lands mostly on the pretext of getting permanent jobs which has anyway not been the case. Furthermore, the money offered as a capital amount is very much below the existing land rates (for e.g., Kohinoor Steel got tribal agricultural land at Rs.18000/acre). The yearly compensation which had been promised is also being flouted in most of the cases.
- ▶ **Renewable Energy projects have less environment impacts:** Though there are serious issues with large hydro projects, however when compared to the thermal electricity generation which is coal dependent, the hydro technology seems to be better in terms of being cleaner and less hazardous.
- ▶ **Grid connected CDM Projects do not ensure access to lighting to the local areas:** Those projects which generate electricity in the community's backyard do not benefit the immediate local population who continue to live without access to lights. If sustainable development is a key objective then it is important that access to local energy be a priority in grid connected CDM projects.
- ▶ **Biomass projects tend to deprive communities for access to biomass for livelihood:** Most of the so called 'waste' is not actually waste, because it is used for cattle feed, cottage industries, serves as low cost fuel in rural context. The assumption of "waste" in waste to energy generation projects needs to be revisited.
- ▶ **The stakeholder participation is a sham:** Most stakeholder meetings overlook community participation. Though stakeholders meetings with some village representatives (mostly sarpanch) are conducted as a necessary evil for the purpose of a valid PDD, however their participation has little meaning as the deliberations are in English which is beyond the community's understanding. Communities are not aware of CDMs. Moreover their personal/community perceptions are never specifically sought.
- ▶ **Flawed Company Policies:** Most of the companies do not hire locals as permanent employees. In case of locals being employed, they are not on the company's permanent rolls (fearing implications of employee benefits), but are hired by a contractor. Migrants from adjacent states constitute a large chunk of workers. This has led to a lot of disillusionment of the local communities.

- ▶ **No regard for occupational health and safety in the company premises for local workers:** Workers work in highly polluted and unsafe conditions especially in sponge iron units. There are no head gears, boots or body protection device provided to them but only during inspection.
- ▶ **Communities are unaware of redressing mechanisms in case of non- performing companies:** the communities are ignorant regarding approaching DOE or writing to them to inform them of the company's negligence towards bringing sustainable development as promised.
- ▶ **No mechanism for voluntary information regarding CDM project by the companies:** There is no public notice board/ other means of communicating that the Company is working on a CDM project.
- ▶ **Company high level officials unaware of ongoing CDM process:** In almost all the cases, the company officials appeared ignorant regarding the CDM process in general and with respect to their organizations in particular. In general they mixed up Corporate Social Responsibility (CSR) with CDM co-benefits.
- ▶ **Role of EIA/ PCB/ DOE questionable:** It is surprising to learn that almost all companies have been given a clean chit by the environment governance/regulatory bodies like the Pollution Control Boards, Impact Assessment Agencies and in particular the Designated Operational Entity which is an independent body responsible for validating and verifying CDM projects. It

was also learnt from the communities that no meetings/issues regarding village/local area development has been discussed ever since the projects were initiated. This also indicates that the DOE has not consulted the local groups for verifying credits. This reality reflects serious flaws in the process.

- ▶ **Dirty politics affecting local development:** Local elected representatives use the company for extracting resources for party affairs. These government officials in turn oblige the companies by not taking action against the company for flouting all mandatory requirements for using safe and sound processes. This has created a lot of anger especially among the local youth, who have lost trust and faith in the government machinery because the local government has taken no action to stop such industries even after the locals have put up a strong agitation.

## RECOMMENDATIONS

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### SUSTAINABLE DEVELOPMENT INDICATORS

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Designing robust criteria for assessing sustainable development benefits is of utmost importance. A checklist of different parameters to each of the indicators is vital. All the dimensions of sustainability should be reflected through a standard set of quantifiable deliverables. More specific indicators have been spelt out below within the framework of the current indicators of the Government of India.

**Social well being:**

- ▶ Additional employment created: increase in number of man days/ man years for how many and for what periods of time
- ▶ To what extent are health benefits accruing due to the project activities: men/women/ children?
- ▶ To what extent are education facilities being expanded by the project proponent: enrolment in schools, opportunities for higher education, improvement in adult literacy
- ▶ Type of basic amenities enhanced: drinking water, sanitation, housing, civic amenities, access to improved energy sources etc.
- ▶ Nature of new infrastructure created for community benefit
- ▶ Special provision for welfare in terms of old age support, work injury, sickness and maternity etc
- ▶ How the project is helping in improving social cohesiveness in the community: promoting youth clubs, entertainment centres, cultural activities etc.

**Economic well being:**

- ▶ Type and number of industries that are expected to be set up as a result of the CDM project providing financial returns to the local communities
- ▶ Employment opportunities created
- ▶ Improved household incomes

- ▶ Increase in savings potential
- ▶ Details of how the communities will benefit with additional investment in the area

**Environmental well being:**

- ▶ Effects on crop productivity, pasture land, forest cover, livestock,
- ▶ Initiatives for soil conservation and enhancing water resources
- ▶ Measures to enhance bio diversity
- ▶ Other specific initiatives to conserve local resources

**Technological well being:**

- ▶ Nature of best practice being implemented, if any.
- ▶ Measures for capacity building of local communities including the outreach

It should be obligatory on the part of the project proponent to undertake vulnerability assessments of the communities who are going to be affected by the project. A report of the same must be provided in the PDD. The project should present the inter-linkage between social, economic, environment and technological well being. Negative/ irreversible side effects envisaged such as displacement, deforestation, and outmigration need to be considered before registering CDM Projects.

## QUALIFICATION CRITERIA FOR CDM PROJECTS

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- ▶ The qualification criteria for CDMs must be based on sound principles. Only high quality offsets that comply with criteria as laid out by the Gold Standard should qualify for CDM credits. Moreover, Annex I countries should commit to purchase a minimum quota of projects with high sustainable benefits in their portfolio.
- ▶ In order to avoid negative impacts on grassroots communities CDM projects must refrain from the following:
  - **CDM projects on sponge iron and its ilk should not be part of the CDM mechanism** by the virtue of such projects being disastrous on livelihood and ecosystems which defeat the very purpose of achieving sustainable development.
  - **CDM projects must be actively discouraged on private lands.** The projects studied indicate the adverse impact on the survival of communities who apparently lose the only means of livelihood - their land.

## TYPOLGY OF PROJECTS

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- ▶ **Grid connected Projects:** It should be made mandatory for CDM projects which connect to the grid to provide electricity access to the immediate local communities. This has so far never been the case where local resources are being exploited to generate electricity to serve urban and industrial requirements, without the community benefitting from it.

- ▶ **Waste to Energy Projects:** With regards to waste to energy projects, it is very important to assess 'waste' because the waste in most of the cases is not just waste but a livelihood resource for the communities. Before embarking on such projects it is important to know the present use of such waste which needs to be articulated in the PDD. A note on the trade off would also be important.
- ▶ **Hydro projects:** The hydro technology as indicated earlier seems to be better in terms of being cleaner and less hazardous. Yet the social consequences of large hydro projects which cause displacement are phenomenal. Hence it is recommended that small. Especially, 'micro' hydro projects which do not cause displacement must be a priority for hydro based projects.

## PROCESS ISSUES

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- ▶ **Environmental Impact Assessment (EIA):** All CDM projects should engage an independent body to undertake an 8-season EIA based on primary research. The results should be published in public domain and be translated into the local language. Moreover, any comments received must be taken into account by DOEs in the CDM public commenting period.
- ▶ **Stakeholder Involvement:** Although it is a key requirement in the CDM process cycle, the stakeholder consultation process is a formality that is hardly ever taken seriously by project developers and Designated Operational Entities (DOEs). This applies to both the obligatory stakeholder meetings and the 30

-day public commenting period. In most cases this is just a fulfilment of an obligation for the PDD on part of the project proponent. A defined number of stakeholder meetings should be made mandatory until the project period. A report of the same with follow up actions should be part of DOE's validation and monitoring process.

- ▶ It is recommended that the PDDs must be translated into **local languages and hard copies made available to local communities three months in advance of a public consultation**. The meetings should be conducted by an independent non-governmental panel and the report of the panel should be made available in the public domain. The MoU between various organisations involved and the financial agreement should be made public and made available in the local language.
- ▶ Although *citizen groups* have to be informed about an upcoming CDM project, this barely ever happens in practice. **More detailed guidelines about stakeholder consultation are needed**. Citizens can play a watchdog role during the monitoring phase of the project.
- ▶ The company should also generate awareness **among its employees/ management** (who otherwise are clueless on the issue) regarding CDM process being undertaken by the company.
- ▶ **Role of DoE to be made more transparent:** The performance of Designated Operational Entities (DOEs) so far is alarming.

Financial penalties for DOEs should be introduced if they fail to meet requirements (such as failing to take into account public comments). Finally, to avoid the current conflict of interests that DOEs are serving the Board but are paid by the project participants, DOEs should be selected and paid by the UNFCCC Secretariat. To cover these costs, the UNFCCC Secretariat should directly charge the project participants a validation fee.

- ▶ **Civil society participation:** There is very limited engagement of civil society / NGOs in implementing CDM projects. There are only five NGO all over the country implementing community oriented CDM projects. This is dismal figure and requires increased and effective participation. To date there is little participation of representatives to the CDM Designated National Authorities Forum and the annual CDM Joint Coordination Workshop. This is hardly acceptable as all accredited observers to the UNFCCC require an equal role in informal gatherings and meetings.

## POLICY FRAMEWORK

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- ▶ 'Small' projects under the CDM process refers to projects with a potential of 15 MW. This scale needs to be reviewed if CDMs aim to benefit the world's poor majority. Small projects should include 'mini' and 'micro' categories. This would enable very small projects to be taken up by various stakeholders.
- ▶ Develop a policy framework defining a percentage of CDM projects to be aimed at improving energy availability through renewable sources for areas which do not have access to

electricity (especially the energy starved tribal or other remote regions). In this context **'small' scale CDM projects comprising DEOs should be promoted to improve energy access for such remote areas**, which are mostly out of the grid. This approach would address the twin objectives of CDM i.e., to enable emission reduction and also achieve sustainable development goals. This is crucial considering that 56% of households in rural India do not have access to lighting.

- ▶ For the purpose of ensuring energy availability for these regions 'bundling' of projects should be across a mix of suitable technology options, which will have the potential to power a group of villages (treated as a '*cluster*'). For *e.g.*, a mix of hydro, solar, wind and biomass technologies could be worked out to meet the entire livelihood requirements of "off grid" areas. This will have implications not only on emission reduction but will also develop a community owned and managed local energy system which would trigger and support other livelihood activities thereby ensuring sustainable development.
- ▶ Among the projects cornered by giant companies, there should be a defined percentage of Projects with '*high local development benefits*' (which are presently less attractive for investors due to high transaction costs).
- ▶ Proactive involvement of local communities in sanctioning CDM projects in their areas needs to be strengthened. In most cases this is just a fulfilment of an obligation for the PDD on part of the project proponent. Subsequent follow up meeting of stakeholders is not done. A one time stakeholder meeting

before the project has been initiated has little meaning. A defined number of stakeholder meetings should be made mandatory until the project period. A report of the same with follow up actions should be part of DOE's validation and monitoring process.

- ▶ Community access to resources generated from CDM Projects is vital. A mechanism should be worked out to ensure equitable sharing of benefits between the project developer and the local communities. A monitoring mechanism for the same should be established. It is also recommended that a part of the local MP/ MLA Fund be directed towards benefitting communities impacted by the CDM projects.
- ▶ Accrediting CERs to companies should be subject to meeting '*verifiable*' sustainable development parameters (which is not done at the moment due to lack of quantified deliverables which can be verified). At the moment CERs are granted solely based on emission reduction targets. Hence, it must be mandatory upon the DNAs (Designated National Authorities) to review and work out specific deliverables under each of its sustainable development goals/indicators.

**ANNEXURE I: TYPE OF CDM PROJECTS ACROSS STATES IN INDIA**

No	STATE	WASTE HEAT UTILISATION/RECOVERY PROJECTS	INDUSTRIAL PROCESS /MFG	HYDRO	BIOMASS	SOLAR	WIND	ENERGY EFFICIENCY/ FUEL SWITCH	SOLID WASTE MGMT	OTHERS ( METHANE RECOVERY)	FUGITIVE EMISSIONS FROM PRODUCTION*
1	ASSAM	1									
2	BIHAR		1		2						
3	DELHI							1	1		
4	GUJARAT	4	1		1	1	2	16			1
5	HIMACHAL PRADESH			12	1					1	
6	KARNATAKA	2	1	15	10		10	1		1	
7	MADHYA PRADESH		2	1	3		1	1			
8	PONDICHERRY	1						1			
9	PUNJAB			3	16					1	
10	RAJASTHAN	2	3		6		8	6			
11	SIKKIM			1							
12	TAMIL NADU	2	1		9		14	3		1	1
13	UTTAR PRADESH	1	1		24			7		2	
14	UTTARANCHAL			2							
15	MAHARASHTRA	3	3	3	8		17	6		1	
16	WEST BENGAL	3		2				12		1	
17	CHHATTISGARH		2		13			13			
18	ANDHRA PRADESH	3	3	3	22		2	7		1	
19	ORISSA	3	2	2				1	2		
20	JHARKHAND	3									
21	GOA	1									
22	KERALA	0		1							
	<b>TOTAL</b>	<b>29</b>	<b>20</b>	<b>45</b>	<b>115</b>	<b>1</b>	<b>54</b>	<b>75</b>	<b>3</b>	<b>9</b>	<b>2</b>

\*THIS REFERS TO PROJECTS RELATED TO HFC REDUCTION

**ANNEXURE II: GOVERNMENT OF INDIA INDICATORS FOR SUSTAINABLE DEVELOPMENT CORRESPONDING TO INDICATORS IN THE PROJECT DESIGN DOCUMENT**

***Social well being:*** *the Project should lead to alleviation of poverty by generating additional employment, Removal of social disparities, contributing to the provision of basic amenities to people leading to improvement in the quality of life of people.*

**ITC Paper and Pulp:** The project activity leads to avoidance of coal, which is an important source of energy for the utility sector in India. Often due to shortage of coal supply the thermal power plants undergo forced outages. Thus reduction in coal consumptions in the industrial processes can be used for more important usages such as electricity generation for domestic consumption at rural areas. Further, as there is an expected reduction in electricity consumption from the project activity, same could be made available for other purposes where the demand is more than the supply

**ITC Afforestation Project:** The present project activity will lead to strengthening of the village level institutions that works towards empowering the poor and the deprived. The institutionalised mechanisms for the implementation of the project activity through Mandal Samyakhya (MS) would be responsible for bringing about social well-being to the poor and marginalized farmers in the region

**Perpetual Biomass:** Since, the project is in a rural area, the project has led to the development of the region. Since, the biomass resources are collected and transported to the plant site from the fields, opportunities are generated for the rural people to collect and transport biomass. This has resulted in the enhanced employment of the rural people.

More and more rural industries are expected to be set up as a consequence to the power plant in the area. This also will cause infrastructure development in the area, which ultimately leads to the rural development. This also prevents the migration of the rural poor to cities large extent due to opportunities created by the power plant. In order to ensure sustained sources of raw material supply to the power plant, the company has embarked on encouraging energy plantation by the

farmers in their wastelands:

**Middle and Lower Kolab Hydro electric project:**

- a. Employment generation during construction of the two power plants for over 750 persons for a period of 18 to 24 months;
- b. Generation of permanent employment during operation lifetime of the two projects.
- c. A hydropower plant of 37 MW size (25 MW + 12 MW) is expected to create permanent employment for over 60 skilled persons and an equal number unskilled persons.
- d. Rural infrastructure development such as creation of roads, establishment of schools and other civic amenities such as medical facilities, post office etc.
- e. Meeting the power demands of the region through sustainable electricity generation.
- f. Installation of tube wells to meet the drinking water requirements of the people.
- g. The project will also cater to the education and health facilities for the local villagers. The project proponent is already running a medical facility in the project site.

**Samal Hydro project :** The project activity leads to alleviation of poverty by generating direct and indirect employment during construction of the project as well as during operation. The project hires 180 labourers (peak) and 100 labourers (Average). The labourers will be supplied with free fuel by the contractor/developer to avoid cutting of trees from the adjoining area.

Health care for the employees will be attended to:

- a. at the project hospital existing in the Samal barrage township within 1-2 km distance from the project site
- b. at 3 nos. health centres existing in Kanhia Block

**Kohinoor Steel and Power Limited:** The project is expected to create a significant employment opportunities (directly, by way of manpower required to build / operate/maintain the unit and indirectly by generating power and thus eliminating the need to with draw power from an already deficit grid). Further, with growing technological advancement, the project

activity contributes to the capacity building in terms of technical knowledge and long-term skills. Such project, which involves energy efficiency, will certainly have long term direct and indirect social benefits. The implementation of the project activity will bring about an increase in the business opportunities for contractors, suppliers, and erectors at different phases of its implementation. This will improve the local economic structure and hence social status of the involved people

**Aarti CDM:** Chhattisgarh State Electricity Board (CSEB) has projected Power deficiency in the state between generating capacity and demand and supply of electricity from grid; leading to import of electricity from central grid and other sources. Hence the project activity contributes in reducing this deficit by not demanding any further power required for its steel melting facilities and giving the surplus power to CSEB grid. This enables the CSEB to satisfy more consumers leading to more employment for skilled and professional people in the state. The project activity also increases the employment within and outside the company for skilled manpower and professionals as well as for semi skilled & unskilled manpower also.

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***Economic well being:*** *The CDM project activity should bring in additional investment consistent with the needs of the people*

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**ITC Paper and Pulp:** As the project activity reduces steam and electricity consumption it is expected that there would be marginal reduction in energy cost associated with pulp production.

**ITC Afforestation project:** The present project activity would result in the alleviation of poverty by generating additional income from the proceeds of the wood sale. The initiatives by ITC to share knowledge and assist the farmer with agricultural/forestry practices would enhance the income generation capability of the farmers and thus lead to improvement in livelihood generation of the farmers.

**Perpetual Biomass:** The project activity has generated employment in the local area. The project has also provided economic value to agricultural and wood wastes and has provided stable and quality power to neighboring industries, farmers

and households. The project has created business opportunities for local stakeholders such as bankers, consultants, suppliers, manufacturers, contractors, etc.

The main resources for power generation are biomass fuels such as rice husk, juliflora, etc. Crop residues are collected from the farmers out of their field and brought to the project, thus generate additional revenue on account of supply of these crop residues to the project, which are otherwise being under-utilized/burnt so far with no commercial value. In other words, the plant is generating commercial value to crop residues enabling the farmers to get better price out of their produce augmenting their income. The above benefits due to project activity ensure that the project contributes to the social and economic well being in the region.

**Middle and Lower Kolab Hydro electric project:** Rural infrastructure development such as creation of roads, establishment of schools and other civic amenities such as medical facilities, post office, etc.

**Samal Hydro electric Project:** The project would bring in additional investment to the region. Project participants invest in the project about Rs.1108.3 millions (US\$ 24.09 million) which otherwise would not happen in the absence of the project. This is a very significant investment in a rural area.

More and more rural industries will be set up and new opportunities for development will be created as a consequence to the hydroelectric project in the area. This will result in infrastructure development, which ultimately lead to the rural development and prevent the migration of rural poor to cities.

**Kohinoor steel and Power Limited :** The project activity has resulted in bringing more employment to the backward region and created a regular source of income by developing the economic situation of the region.

**Aarti CDM:** The state will generate revenue out of the manufacturing activities, supported because of this captive power generation by way of taxes and cess, etc.

**Environmental well being:** *This should include a discussion of impact of the project activity on resource sustainability and resource degradation, if any, due to proposed activity; bio-diversity friendliness; impact on human health; reduction of levels of pollution in general.*

**ITC Paper and Pulp:** As the project avoids emission from coal usage, it leads to indirect avoidance of environmental destruction and pollution associated with coal mining and coal transportation. There is no additional adverse environmental impact from the project activities

**ITC Afforestation** project through the project activity, plantations once established, would act as a carbon sink. In addition, the plantation would also act as a man-made green belt and bring about gradual environmental improvement to the region. Further, as the project activity is undertaken on a degraded land, the plantations would help control soil erosion, which in turn would improve soil and vegetation cover in the region.

**Perpetual Biomass:** Since, the project uses only biomass materials for power generation, which otherwise would have been a fossil fuel such as coal, lignite and gas, the project does not lead to GHG emissions. Combustion of biomass materials in the project result in GHG emissions of CO<sub>2</sub>, CH<sub>4</sub> and NO<sub>x</sub>. The major constituent of GHG emissions is CO<sub>2</sub> which about 98%, whereas CH<sub>4</sub> and NO<sub>x</sub> constitute the remaining 2%. This can well be evidenced from the typical ultimate analysis<sup>3</sup> of biomass materials, which indicates the Nitrogen content is within 1 to 2%, therefore CH<sub>4</sub> emission is negligible. Hence the CO<sub>2</sub> is considered as the only GHG emissions from the biomass combustion.

Since the biomass is formed by fixing the atmospheric CO<sub>2</sub> by the action of photosynthesis in the presence of sunlight, the CO<sub>2</sub> released due to combustion of biomass is assumed to be equal to the CO<sub>2</sub> fixed by the photosynthesis. Again the CO<sub>2</sub> released during the combustion will be consumed by the plant species for their growth. In view of the above, biomass combustion and growth of biomass and associated CO<sub>2</sub> consumption and release can be treated as cyclic process resulting in no net increase of CO<sub>2</sub> in the atmosphere. Hence, the project activity will not lead to GHG emissions

**Middle and Lower Kolab Hydro electric Project:** Conservation of depleting fossil fuels such as coal, oil, natural gas which

at present are predominantly used for power generation

**Samal Hydro electric Project:** Since, the project utilises hydro potential available in an existing barrage for power generation, the project does not lead to any GHG emissions and cause no negative impact on the environment. The project also does not lead to degradation of any resources, health standards, etc. at the project area.

Further, green belt will be developed around the powerhouse and colony area to develop the site to enhance its ecological and aesthetic aspects.

**Kohinoor Steel and Power Limited:** In India, a major share of the country's electricity is generated from fossil fuel sources such as coal, diesel, furnace oil, etc. The proposed waste heat recovery CDM project will displace or replace the equivalent quantity of electricity generated in the grid. Since the project is able to avoid all the associated pollution occurring related to extraction, processing and transportation of natural resources, it promotes an overall environmental well-being. Apart from this the project will also help in eradicating the local air pollution.

**Aarti CDM**The waste heat recovery CPP in ASPL will displace/replace the coal based AFBC Captive power generation; thus Project activity saves further depletion of natural Coal reserves and reduces CO2 emission which would have been otherwise emitted into atmosphere while generating electricity from coal based captive power plant The Project activity uses Waste heat recovery based Power Plant by utilizing waste heat from flue gases coming from process and thus effectively saving environment of thermal pollution. The proposed waste heat based power generation activity does not consume coal thus there is no generation of any solid waste like fly ash which would otherwise be generated on consumption of coal. The disposal of fly ash has been a serious environment concern. Thus the Environment is also benefited by reduced solid waste problem.

**Technological well being:** *The CDM project activity should lead to transfer of environmentally safe and sound technologies that are comparable to best practices in order to assist in up-gradation of the technological base. The transfer of technology can be within the country as well from other developing countries also.*

**ITC Paper and Pulp:** The project activity leads to enhancement of technical skills of the employees and their ability to learn about new technologies through research and development. With the advent of the 'first of its kind' technology in the country, the other pulp and paper units in the country will be encouraged to explore energy efficiency technology leading to conservation of energy.

**ITC Afforestation Project:** the present activity uses clonal technology, which is environmentally sound and cost effective. Taking advantage of this project activity, the local tribal, who lack the technological expertise, will be able to harness information and knowledge and gain benefit from the degraded land by using this environmentally safe and cost effective clonal technology. The proposed activity based on clonal technology would also foster continuous improvement in productivity.

**Perpetual Biomass:** The technology selected for the proposed project is a more energy efficient technology due to the following features. The project uses a steam turbo generator with matching boiler of traveling grate type capable of firing multiple fuels with highest possible system efficiency. In addition, the auxiliary power consumption for travelling grate type is relatively less than other efficient combustion systems.

**Middle and Lower Kolab Hydro electric Project:** Not specific

**Samal Hydro electric Project:** The project would lead to utilisation of environmentally safe and sound technologies in small hydroelectric power sector. Further the project demonstrates harnessing of hydro potential in irrigation projects and encourages setting up such new projects in future.

**Kohinoor Steel and Power Limited:** Waste Heat Recovery based captive power plant is a cleaner technology that uses the waste flue gases of sponge iron kilns which otherwise would have been emitted to the atmosphere leading to its pollution. The electricity generated by the plant is consumed for both auxiliary and captive purposes. Hence, the project activity has contributed to a better quality environment to the employees and the surrounding community.

**Aarti CDM:** The Project activity uses waste heat from flue gases coming out of ABC, which is otherwise let in atmosphere without any processing or use thus promotes the sustainable technology growth in the industry.

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Energy and Climate Change Desk, Laya

Visakhapatnam, 27th November 2009



Laya is a resource center for Adivasis and also the secretariat of INECC. Laya began working with tribal communities in the East Godavari district since 1984. Currently Laya operates in the tribal belt of the north Andhra region. Laya works with a mission to empower these marginalised communities for assertion of their rights and to promote relevant sustainable alternatives at the grassroots level. It envisages a socially just and humanized society where the marginalised communities find a space for survival with dignity.



Indian Network on Ethics and Climate Change (INECC) is a network of individuals and organization representatives, who are concerned with the Climate Change issues, particularly with reference to the Indian context. It was instituted in June 1996 although it has been in operation since 1993. INECC believes that Climate Change is a part of a larger environmental crisis and addresses the basic issue of ecologically destructive development processes that have been globally pursued. Moreover for INECC, the issue of Climate Change raises basic questions of social justice which has a direct bearing on development alternatives for the future.