This report has been prepared by:

Vasudha Foundation, which is a a not-for-profit ozrganisation set up in April 2010 with the belief in the conservation of Vasudha, which in Sanskrit means the Earth, the giver of wealth and with the objective of promoting sustainable consumption of its bounties. With this in mind, the organisation engages in policy advocacy and research initiatives.

In association with:

Indian Network on Ethics and Climate Change (INECC), which is a national network comprising individuals and organization representatives interested in the climate issue from a micro-macro perspective. It connects the issues of climate change to large sustainable development and social justice concerns. In this context INECC, perceives policy changes in favour of communities who are most impacted by the climate crisis.

And,

Laya, a CSO based in Visakhapatnam, Andhra Pradesh, India, is the Secretariat of INECC.

This study has been supported by **MISEREOR**, which is the German Catholic Bishops' Organisation for Development Cooperation. For over 50 years, MISEREOR has been committed to fighting poverty in Africa, Asia and Latin America.

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CDM Projects in India: Do they truly promote sustainable development?

A mapping and analysis of select CDM projects in India

Prepared by:

VASUDHA FOUNDATION
Green ways for a good earth!

In association with:

INECC

Laya

FOREWORD

Climate change is the greatest global challenge facing us today which through a multitude of impacts poses a risk to our ecology, economy and society. Several responses have been designed to counter the crisis; the Clean Development Mechansim (CDM) being one of them. Principally, this mechanism did provide an opportunity for developing countries to embrace sustainable development while also allowing developed countries meet their Kyoto commitments. What certainly has been unclear is the contribution of CDM projects to the nature of sustainable development achieved in the host countries. “Money for Nothing” (2008), a grassroots study on CDM in India under taken by 'Laya Resource Center' was an important beginning towards understanding the perceptions of grassroots communities on whose backyard these CDM projects operated. The reality check was utterly disturbing!

The current study builds on the previous study and analyses 25 projects comprehensively across 10 states and 8 sectors. This study was facilitated by Laya-INECC and undertaken by Vasudha Foundation. The study focuses on sustainable development goals and assesses the manner in which sustainable development has been approached in its articulation in the Project Design Document (PDD) as well as in operational terms. The study also assesses the role and intent of the private sector companies, to support overall socio-economic and environmental development in the areas they operate. The uniqueness of the project lies in being one of the very few studies that have collected primary data from the field and examined the sustainability commitments of CDM project holders.

The study while presenting a critical view on each of the projects calls for urgent overhauling of the 'institutional framework of CDM both globally and from a domestic perspective' in its current form, if it is to stay, or alternatively feed into the emerging frameworks like NMM (New Market Mechanisms) being deliberated for a post 2015 regime. It argues for the need for effective peoples' participation in validation of CDM projects, meaningful stakeholders' consultation and demands accountability of project proponents in cases where projects have militated against the interest of the marginalized communities. It suggests that CDM projects should be designed in a way that meets emission reduction objectives whilst also building resilience and adaptation among communities in the process, if it is to contribute to Sustainable Development.

We hope that the priorities identified by the study will lead to sound implementation of strategies at the level of the UN and the Indian government, that will help to address the challenge of climate change in a way that encourages meaningful development of communities and fosters an inclusive , low carbon sustainable development pathway

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- Paryavaran Mitra, Gujarat
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- Pipal Tree, Karnataka
- Women's Organisation for Rural Development, Orissa
- CASA, Rajasthan
- Navrachna , Chhattisgarh
- Resource for Legal Action, Andhra Pradesh
- CESPR, Assam

We also gratefully acknowledge the time, valuable inputs and contributions from experts and civil society representatives during the workshop "New and Emerging Frameworks for Sustainable Development in a Climate Changing world" organized on the 3rd of September at TERIGRAM which helped us in sharpening and strengthening the document.

Last but not the least, we take this opportunity to thank MISEREOR without whose support this study would not have been possible.

Ajita Tiwari Padhi,
National Facilitator,
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EXECUTIVE SUMMARY

The Fifth Assessment Report of the Inter-Governmental Panel on Climate Change, released its final synthesis report in early November 2014, making it amply clear that the impacts of climate change, if left unchecked will increase the likelihood of severe, pervasive and irreversible impacts for people and ecosystems. It presents stark and sharp warnings especially for developing countries like ours where impacts of Climate Change would derail the objective of sustainable development which has been an overarching national priority. The Fifth Assessment report also comes at a time, when countries are gearing up their negotiations for a comprehensive, legal and an equitable global framework to address climate change, to be agreed in the Meeting of the Conference of Parties to the United Nations Framework Convention on Climate Change (UNFCCC), at Paris, in December 2015. The new global regime being negotiated is expected to incorporate lessons and experiences gained from various instruments which played a role in reducing emissions and transitioning to a low carbon future.

The Kyoto Protocol, had created and institutionalized an international market based regime for reducing greenhouse gas emissions, called the "Clean Development Mechanism (CDM)". The carbon market route was primarily conceived as a mechanism by which industrialized countries can offset a part of their emission reduction obligations by investing in low carbon projects in developing countries, while at the same time, through these low carbon projects, create pathways for sustainable development in developing countries where such projects come up.

Against this backdrop, Laya with the Indian Network on Ethics and Climate Change (INECC) and in partnership with Vasudha Foundation undertook a detailed analysis of a basket sample of CDM projects in India. The objective of this was to examine the nature and extent of sustainable development being fostered by registered CDM projects in while also specifically analyzing if these projects have benefitted communities from a socio-economic and environmental perspective as promised by the promoter companies in their project submission to the United Nations Executive Board (UNEB).The study also attempted to critically examine the GoI indicators on Sustainable development for CDM projects. India, being the home to the second largest number of CDM projects world wide, with a total of 2857 approved projects spread across 28 states of India, the study presented a sector wise perspective of CDM projects and identified specific policy and process gaps impeding achievement of Sustainable development.

The basic premise behind the study was to use the analysis from India, to feed into the global negotiations towards the Paris Climate Outcome, while at the same time, trying to influence,

India's formulation of Indented nationally determined contributions(INDC), as one route towards funding INDC, could also be through the carbon markets.

The methodology adopted in the study was two pronged: The first phase was the desk study which involved mapping of approximately 2100 registered CDM projects, following which a sample of strategically selected projects reflecting a fine balance between sectors and geographical spread were analysed. Projects covering 8 sectors from 10 key states were shortlisted for detailed field visit and analysis. The shortlisted projects from the 8 sectors included, wind farms, bio-mass projects covering both bio-mass and bio-mass co-generation based projects, solar farms and solar decentralized units, run of the river hydro projects, super-critical thermal power projects, energy efficiency projects covering lighting, industrial efficiency, alternative fuel and cogeneration, afforestation and reforestation projects and municipal solid waste projects. The states covered in the study included Andhra Pradesh, Maharashtra, Gujarat, Rajasthan, Karnataka, Himachal Pradesh, Orissa, Chhattisgarh, Jharkhand, Assam and Arunachal Pradesh.

Further, in order to analyze the CDM projects from a sustainable development perspective, a few broad parameters were identified to benchmark and assess the nature of contribution to sustainable development pathways, as mandated in the Kyoto Protocol. The parameters identified were primarily drawn from the Project Design Documents (PDDs) which were also reflected in various literatures available globally on sustainable development practices and also as agreed by various UN bodies from time to time.

Broad findings :

- The largest concentration of CDM projects is in the states of Tamil Nadu (368), Maharashtra (370), Gujarat (361), Karnataka (254) and Andhra Pradesh (210). The CDM projects in these states constitute about 55% of the total CDM projects approved in India.
- The large concentration of industries in these states, along with a fairly high GDP is also perhaps the reason for these states to attract CDM projects. Since, accessing the CDM market requires technical and resource capacities, which these states do have, is also yet another reason for a large concentration of CDM projects.
- In terms of sectoral break up of CDM projects, renewable energy and energy efficiency projects have the maximum share.
- In general, the benefits of availing the Carbon Markets, if any, have largely been restricted to the company or the project promoter per se, with very little actually being passed on to the communities.

- In most cases, the sustainable development benefits as outlined in the various Project Documents (PDDs) are loosely defined by the companies, and the impact of most CDM projects on indicators such as poverty and employment was found to be insignificant.
- Companies are implementing the social, economic, and environmental benefits through their Corporate Social Responsibility (CSR) divisions, and that too very irregularly and nothing that actually promotes sustainable development. In many cases, we found that there could be an overlap of activities done through CSR and part of their indicated actions as stated in the CDM Project Development Reports. However, clear lines of distinctions have not been drawn between the two.
- Most companies have held stakeholder consultations with the local stakeholders and informed them about the project activity and its sustainable benefits. However, there seems to be a mis-match between people's expectations and the actual delivery. It has been difficult for us to judge, if the expectations of people were more than what was promised, but, nevertheless, there is a fair amount of resentment by communities on what they have got from the companies.
- Some of the CDM projects that were visited had not been validated yet, or were still under construction. Therefore, the gap between their sustainable development claims and the ground reality could not be determined.
- There is no monitoring and evaluation system in place at any stage of the CDM process to determine the progress on sustainable development resulting from the project activity.

Specific Observations/Findings:

- Most sustainable development claims (especially for employment) are ambiguous and open ended. For example, the PDDs claim that the project activity will generate employment in the area and lead to social upliftment of the communities, however most employment generated is of a contractual or seasonal nature.
- Employment offered at most of the project sites to communities are, usually menial jobs such as "Guards", "helpers" and so on. Even jobs, that require some basic competencies like "drivers" have not been offered to local communities.
- There have been some indirect employment benefits in the case of some projects, particularly, co-gen based projects, which have helped sugar-cane farmers to benefit from locally available market for their sugar cane. However, there are very conflicting views on the actual price of sugar cane paid to farmers. While companies claim that they have a minimum support price for sugar cane, which is based on the prevailing market prices, local farmers have claimed that, it is far less than the market price.
- As part of the project activity, some companies have helped local communities by renovating primary schools and associated infrastructure, conducting health check-up

camps, and carrying out plantation drives. However, the benefits of these activities are difficult to measure and seem extremely sporadic.

- However, what clearly emerged is that the amount of money spent on these projects, did not definitely is even close to the amount that companies have promised to invest for community development, as stated in some PDDs, as part of their revenue sharing from CDM proceeds for community development.
- Most project documents have talked of improved infrastructure access, particularly, roads. However, our observation in most of the project sites and the surrounding areas that we visited, the road infrastructure was particularly bad, except for certain approach road to the project office or the actual project site. There seems to be an issue of who is responsible for the road infrastructure. While technically, it is the municipal or district authorities, who should be responsible for the development and upkeep of road infrastructure, we understand from communities, that, due to heavy traffic load for the project purposes, road infrastructure have deteriorated steadily and hence, they believe, it is the onus of the company to help in maintaining good road infrastructure. This claim of communities seem to be right, since, in most cases, companies have specifically stated this in their PDDs.
- In the case of areas, where energy CDM projects, such as solar, wind, hydro etc. are located, one would imagine that surrounding villages are benefitted by the power generation, as generally the evacuation of energy generated are from low voltage lines. However, in the case of most projects, we found that not all surrounding villages/hamlets had access to grid electricity supply.

Other major issues but systemic in nature:

While it is not possible to directly attribute it directly to the companies or the CDM project proponents, a number of issues have come out during the field visit and interaction with communities, relating to:

- Land acquisition
- Land pricing
- Rehabilitation and re-settlement of displaced communities
- Differential – gender discriminatory wages, etc.

Some of the major issues that were brought to our notice from communities were:

a) Not all of the land identified for projects such as wind and solar are or were particularly barren lands, as has been indicated in most of such Project Documents. A number of land were such projects have come up, were, according to communities, quite fertile. A typical example is that of Charanka village, Gujarat, where the largest solar farm has been set up. We were informed that the area was known for its rich cultivation of sesame seeds, which have a good market price.

b) There seems to be a huge mismatch between the prices that communities got for forgoing their land for projects, as against what price the Government had notified

for land acquisition. In some project cases, we found that while the actual Gazette Notification Price fixed for an acre of land was in lakhs of rupees, farmers actually got only a few thousand rupees. There could be a number of reasons for this, and many of these are systemic in nature. But, it is being flagged, as something that needs to be addressed on a war footing, as cases such as land grabbing are very rampant across the length and breadth of India.

c) In many cases, land acquired for projects have led to destruction of community water bodies, which had for long been the source of water supply for the communities for meeting bulk of their water requirements.

d) In many cases, where projects, particularly the Hydro projects, involved rehabilitation of communities, the resettlement and rehabilitation plan has been very poorly implemented and in some cases, communities who have been forced to leave their land, are yet to be completed resettled.

e) Other issues that have come up, include, land acquisition for waste dumps, in the case of waste to energy projects. These waste dumps do not follow any laid down principles for pollution control by the Pollution Control Board and are the root cause for a number of health related problems faced by communities.

f) Issues related to mass environmental and forest destruction, particularly for setting up wind farms have been observed.

Some of the key recommendations that emerged from the findings of the study include:

a. Serious revisiting of the GoI indicators of Sustainable development for CDM projects arriving at an accepted definition of "Sustainable Development" that could form a framework for or a guidance document to assess projects both from a CDM perspective as well as from pro-people development objective.

b. Conceive of creative and 'transformational' Carbon emission reduction trajectories/frameworks which promises effective, stable and durable development.

c. Overhauling institutional and governance reforms of CDM projects including robust mechanism for monitoring and evaluation.

For full details of the recommendations, please do read the relevant sections of the report.

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CDM PROJECTS IN INDIA: DO THEY TRULY PROMOTE SUSTAINABLE DEVELOPMENT?

1. SETTING THE CONTEXT

1.1 Global overview of the Clean Development Mechanism

The Clean Development Mechanism (CDM) is an international market based regime for reducing greenhouse gas (GHG) emissions, which emerged out of the Kyoto Protocol. The original purpose of the CDM as stated in Article 12 of the Kyoto Protocol was "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[1]."

The CDM is implemented at the national level, mostly by the private sector in developing countries (Non Annex countries) and allows developed countries (Annex 1 countries) to reduce their emissions by purchasing certified emission reduction credits (CERs), each equivalent to one ton of CO^2. The mechanism through the project implementation stimulates sustainable development and emission reductions, while allowing industrialized countries some flexibility in how they meet their emission reduction limitation targets.

Besides sustainable development and cost-effective emission reductions the mechanism also has other additional impacts such as domestic investment in low carbon development, net global GHG reductions, energy security, and investments in clean energy.

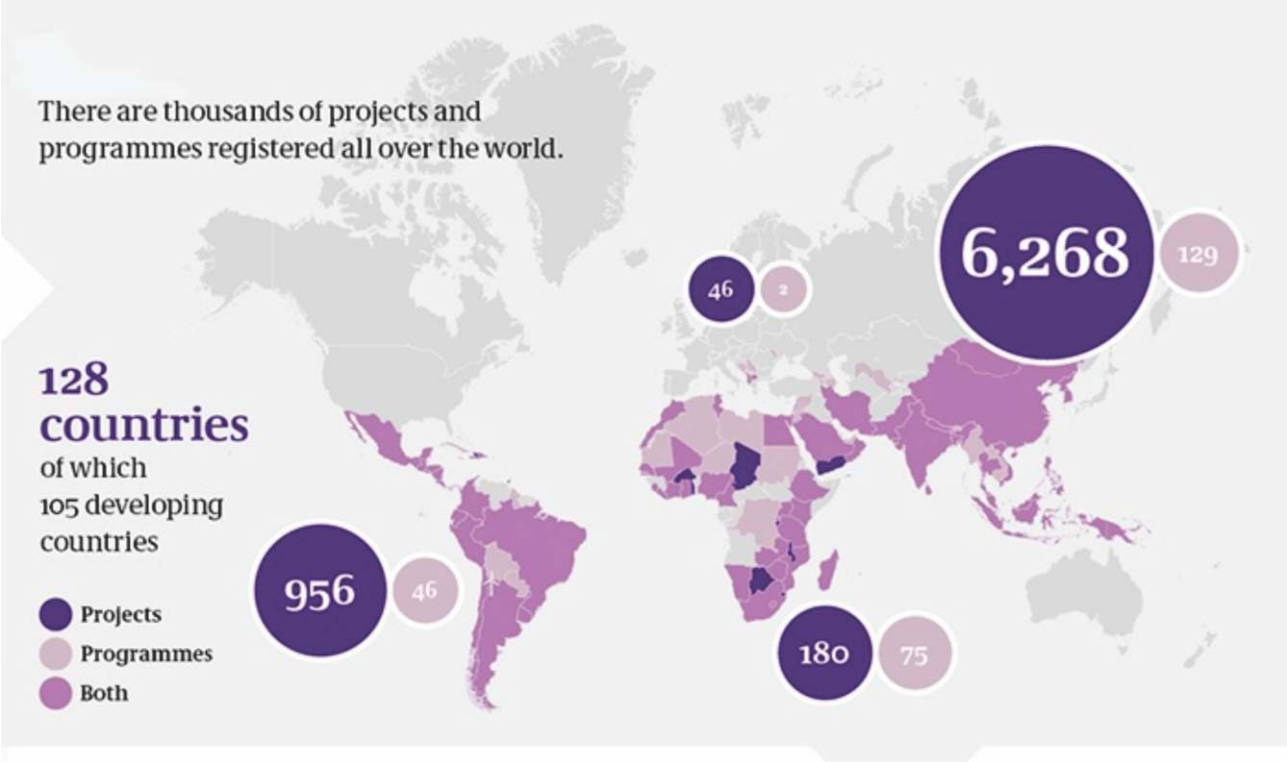
Therefore, the key objectives of the **CDM** as it was conceived are primarily:

- Financial assistance to developing countries to embrace sustainable and low carbon development pathways.
- Assist industrialized countries to achieve compliance of their Kyoto emission reduction commitments
- Contribute to the ultimate objective of the UNFCCC, "... stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system[2]."

[1] http://unfccc.int/essential_background/kyoto_protocol/items/1678.php
[2] https://unfccc.int/ghg_data/items/3800.php

The figure below shows the current global status of the CDM[3]-

FIGURE 1: CURRENT GLOBAL STATUS OF CDM



The projects that are being implemented under CDM range from clean cook-stoves to large industrial projects, and according to the UNFCCC the mechanism has resulted in avoiding approximately 1.5 billion tonnes of Co_2[4]. Another component of the CDM (besides the projects) is the Program of Activities (PoA). It is a modality that allows replicable projects with low and physically spread GHG reductions into the CDM. Under a PoA it is possible to register the coordinated implementation of a policy, measure or goal that leads to emission reduction. Once a PoA is registered, an unlimited number of component project activities (CPAs) can be added without undergoing the complete CDM project cycle[5].

India also has registered PoAs under the CDM. The first PoA to be registered was the Bachat Lamp Yojana[6] for mass distribution of CFLs.

Following table shows the sectors covered under CDM and projects undertaken under each sector till 2012 along with the CER details of each category.

[3]http://cdm.unfccc.int/
[4]Based on CERs issued till June 2014, http://cdm.unfccc.int/Statistics/Public/index.html/
[5]https://cdm.unfccc.int/public_inputs/ProgrammeOfActivities/index.html
[6]http://www.moef.nic.in/downloads/public-information/bachat-lamp-yojana.pdf

TABLE 1: CDM PROJECTS GROUPED IN TYPES TILL 2012[7]

PROJECT TYPE	NO OF PROJECTS	TOTAL CERS ISSUED TILL 2012 (IN THOUSANDS)
Wind	2625	280692
Hydro	2277	344776
Biomass	803	116867
Methane avoidance	725	73214
Landfill gas	412	173226
EE own generation	403	133400
Solar	416	4194
EE Industry	137	9246
Fossil Fuel Switch	139	128925
EE Supply side (power plants)	116	15532
N2O	108	249223
Coal bed/mine methane	108	84900
EE households	103	2856
Afforestation and reforestation	66	18147
Fugitive	59	54099
EE service	36	334
Transport	34	4819
Geothermal	35	12957
Cement	28	21585
Energy distribution	26	5974
HFCs	23	473629
PFCs and Sf6	18	11365
Mixed renewables	10	116
Co2 usage	3	155
Tidal	1	474
Agriculture	2	1
Total	**8714**	**2220703**

The accumulated 2012 CERs is the total GHG reduction in the projects from the start of the crediting period until the end of 2012.

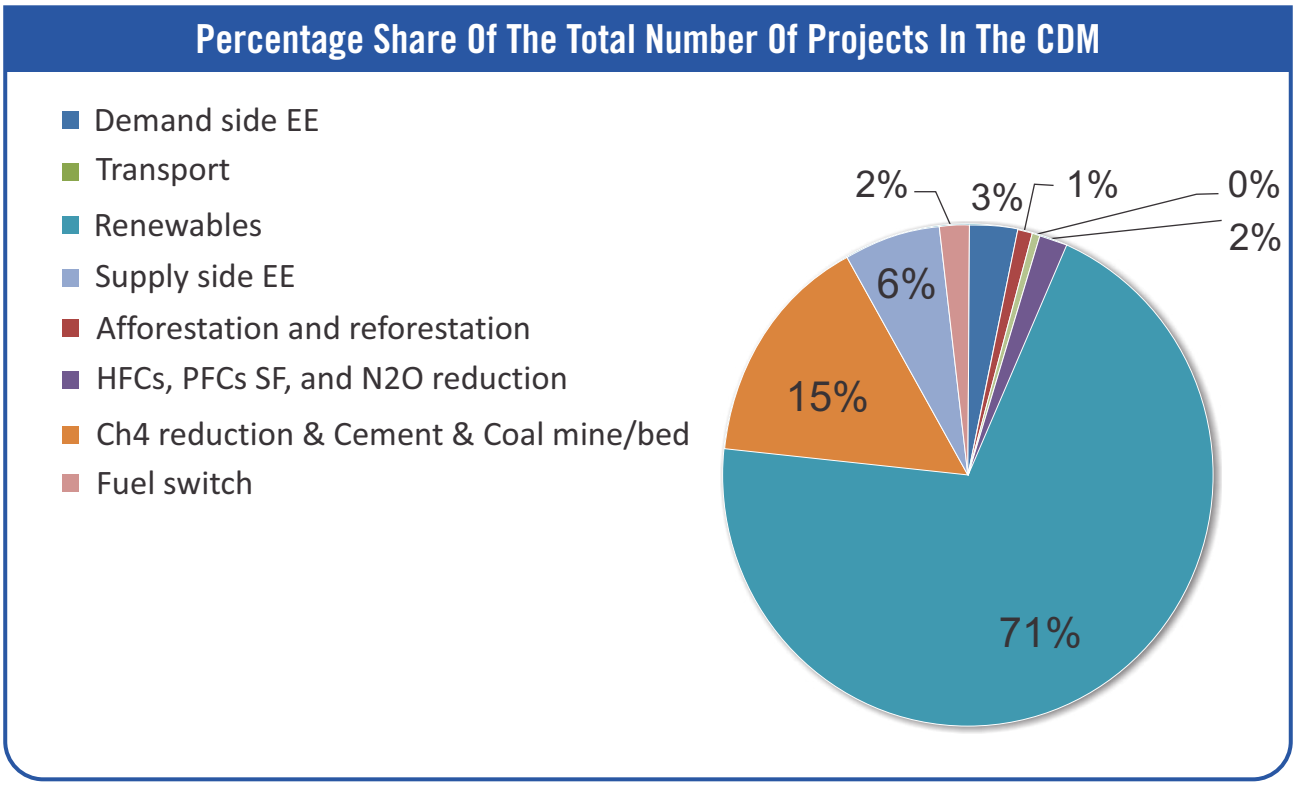
EE - industry has been split into EE - own generation, where electricity is produced from waste gas or wasted energy, and EE - industry, which now only covers end-use savings[8].

[7] UNEP Risoe CDM/JI Pipeline Analysis and Database, May 1st 2014 available at http://cdmpipeline.org/cdm-projects-type.htm#2

[8] Ibid.

The figure below shows the sector-wise project distribution in the CDM. As can be seen the largest number of projects are renewable energy projects.

FIGURE 2: PERCENTAGE SHARE OF THE TOTAL NUMBER OF PROJECTS IN THE CDM CATEGORIES[9]

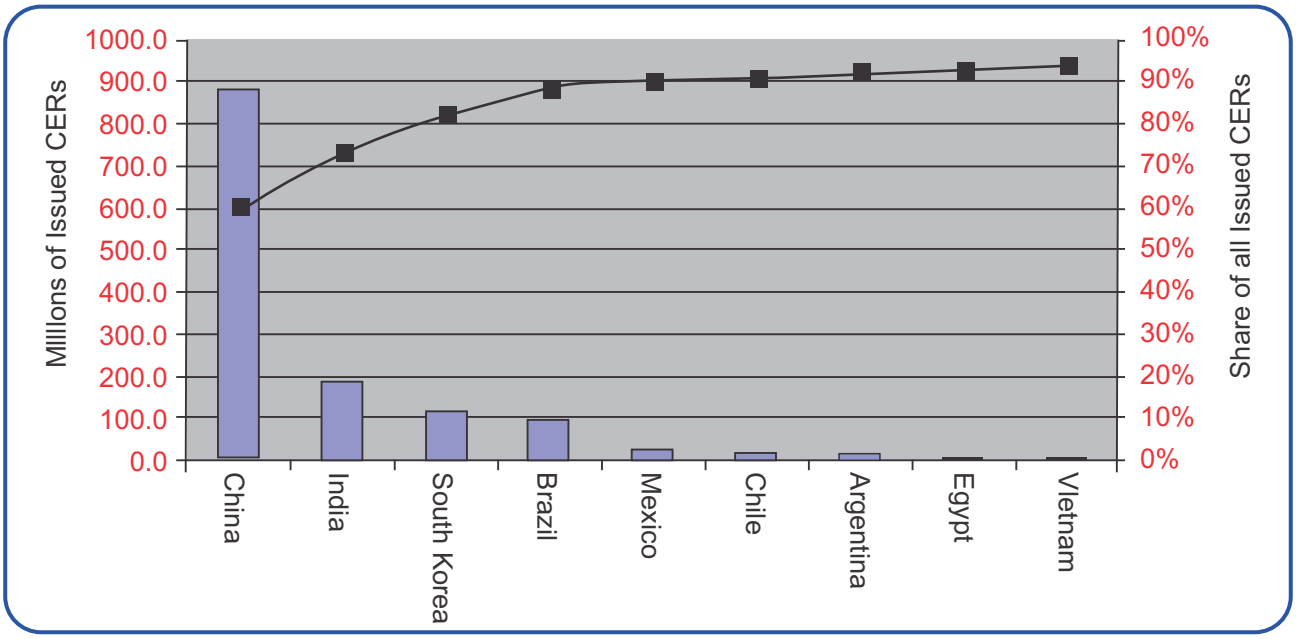


The fraction of renewable energy projects leads with almost 71% of the total projects. Another interesting aspect according to the table above is that certain projects are churning out a larger number of CDM credits in comparison to their purported sustainable development benefits. For example, it can be seen that the HFC projects are just 23 in number (constituting a mere 0.26% of the total projects), yet they are able to churn out almost 21% of the total CDM credits. This imbalance in the ratio of the credits generated by the project in comparison to the sustainable benefits it can offer is an anomaly of the clean development mechanism.

[9] UNEP Risoe CDM/JI Pipeline Analysis and Database, May 1st 2014 available at http://cdmpipeline.org/cdm-projects-type.htm#2

The following figure projects the top global beneficiaries of the CDM Programme

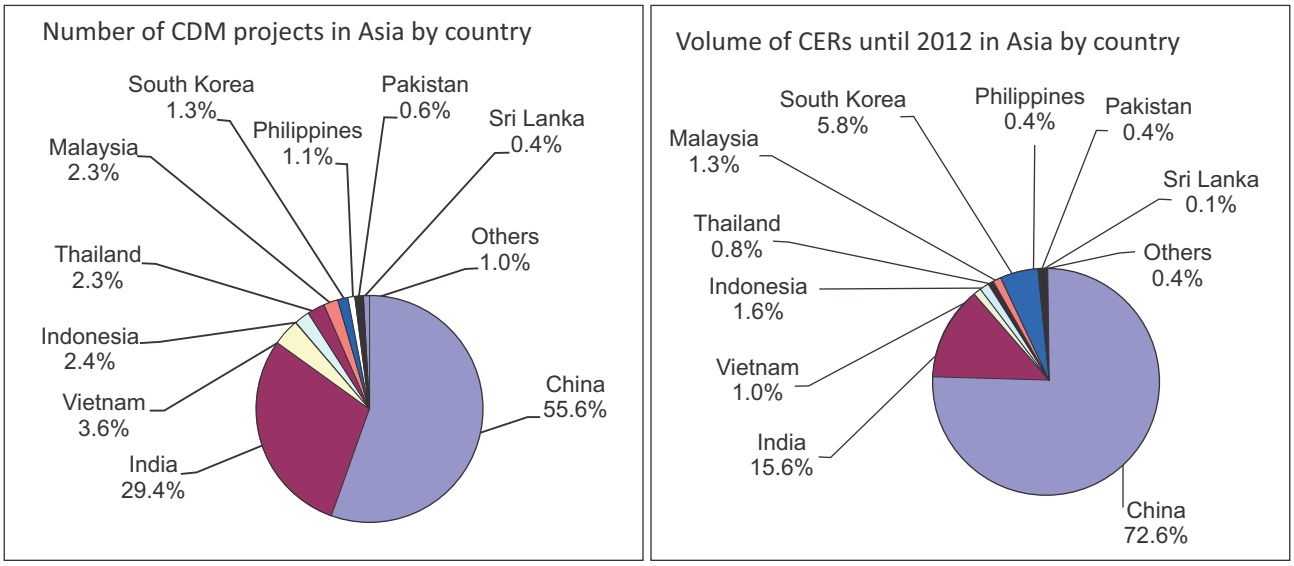
FIGURE 3: TOP COUNTRIES BY ISSUED CERS[10]



Most of the CERs (60.9%) have been issued to projects in China. These 8 countries in the graph earn 96% of the total issued CERs as shown by the line on the graph.

The majority of the projects are hosted by China and India, in Asia. The following figures show the share of the CDM projects and CERs in Asian Countries:

FIGURE 4: PICTORIAL REPRESENTATION OF CDM PROJECTS AND CERS DISTRIBUTION IN ASIAN COUNTRIES[11]



[10]UNEP Risoe CDM/JI Pipeline Analysis and Database, May 1st 2014 available at http://cdmpipeline.org/cers.htm
[11]UNEP Risoe CDM/JI Pipeline Analysis and Database, May 1st 2014 available at http://cdmpipeline.org/cdm-projects-type.htm#2

As the case may be, all the projects that go for registration are not approved until they fulfill all the guidelines of CDM under Kyoto Protocol. The following table reflects the details of registered, withdrawn and rejected projects[12] .

TABLE 2: OVERVIEW OF REGISTERED, WITHDRAWN AND REJECTED CDM PROJECTS

STATUS OF CDM PROJECTS	NUMBER
At Validation	**1183**
Request for registration	13
Request for review	2
Total in the process of registration	**15**
Withdrawn	63
Rejected by EB	269
Validation negative by DOE	265
Validation terminated by DOE	1829
Registered, no issuance of CERs	4929
Registered, CERs issued	2587
Total registered	**7516**
Total number of different projects	11140
Replaced PDDs	1061
Total PDDs submitted	12201

In total, 8738 CDM projects are now included in the Pipeline excluding the 265 projects given a negative validation by DOEs, the 1798 projects where DOEs terminated the validation, the 269 rejected by EB and the 63 withdrawn. 7496 of the projects are now registered and a further 21 are in the registration process. 2579 CDM projects have got CERs issued.

1.2 Sustainable Development in the CDM from a Global Perspective

The UN's World Commission on Environment and Development (WCED) introduced the idea of sustainable development on the political agenda with their report 'Our Common Future' (WCED, '1987). WCED tried to strike a balance between environment and development, North and South, and between the future and the present. The concept emphasized in particular "the essential needs of the world's poor, to which overriding priority should be given," but also "the environment's ability to meet present and future needs." The objectives of CDM are in agreement with the WCED's main challenges for the developed countries.

As mentioned earlier, the two goals of the Clean Development Mechanism are:

1. Lower the cost of GHG reduction
2. Supporting sustainable development initiatives in developing countries.

The second goal of the CDM stems from the Kyoto Protocol's Article 12, which prescribes the need for tangible co-benefits to the countries hosting the projects. However, the Kyoto Protocol does not explicitly define sustainable development, nor does it stipulate how it can be achieved through the CDM; it only requires that project proposals include an explanation of how they contribute to sustainable development.

[12] UNEP Risoe CDM/JI Pipeline Analysis and Database, May 1st 2014 available at http://cdmpipeline.org/overview.htm

The Marrakesh Accords give the Designated National Authorities (DNAs) of host countries the freedom to determine their own sustainable development criteria. The Marrakesh Accords affirm "it is the host Party's prerogative to confirm whether a clean development mechanism project activity assists it in achieving sustainable development" (UNFCCC 2002). Each host country establishes a Designated National Authority (DNA), with the main responsibility of defining and overviewing the sustainable development claims for different CDM projects from their country. The DNAs select the sustainable development standards centered on their national development priorities.

Thus, CDM can contribute to a developing country's adopting the path of sustainable development through[13] :

- Technology transfer and financial resources
- Energy production through sustainable ways (Renewable energy options)
- Contributing towards energy efficiency and conservation objectives
- Poverty alleviation

1.3 India and the CDM

In India, the Ministry of Environment and Forests (MoEF) is the nodal agency for handling issues of climate change and CDM related issues in the country. The MoEF established the Designated National Authority (DNA) in December 2003 as the National CDM Authority (NCDMA), which is chaired by the Secretary of MoEF. Since the CDM guidelines make it a prerogative of the host country to confirm whether the project activity assists in achieving sustainable development, the MoEF lays emphasis on the following aspects of sustainable development for a project activity[14] :

Social well-being: The CDM project activity should lead to alleviation of poverty by generating additional employment, removal of social disparities and contribution to provision of basic amenities to people leading to improvement in quality of life of people.

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

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

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 upgradation of the technological base. The transfer of technology can be within the country as well from other developing countries also.

[13] pg14, CDM Information and Guidebook, 3rd Edition, Denmark, UNEP Riso Centre on Energy, Climate and Sustainable Development

[14] http://www.cdmindia.gov.in/approval_process.php

In the past India had always considered the five-year plans designed by the Planning Commission as the medium-term strategy document for overall development. However, India presented its perspective on sustainable development before the World Summit for Sustainable Development (WSSD) in 2002 as a study titled "Empowering People for Sustainable Development" (EPSD). The four main objectives of the EPSD as outlined by the MoEF were as follows-

1. Combating poverty
2. Empowering people
3. Using core competence in science and technology
4. Setting environmental standards: conservation of natural resources, improving core sectors of the economy.

However, after the WSSD, the Indian government initiated a process of preparing and implementing a national strategy for sustainable development by 2005. Over the years since then, India has developed several projects and programs that can be classified as components of a national strategy for sustainable development, and the MoEF has also published several publications outlining the core components of a sustainability strategy. However, India still does not have a sustainable development strategy.

India's sustainable development focus stems from the millennium development goals which consist of:

1. Poverty reduction
2. Education
3. Gender equality
4. Healthcare
5. Environmental protection
6. Conservation of natural resources
7. Global Partnerships

The 12th Five year plan (2012-2017) of the Planning Commission, contains a chapter on sustainable development. This particular chapter outlines that government's position regarding sustainable development which states that *"If development has to be sustainable, we need to innovate, invest and improve our planning processes at the national, state and local levels*[15]*."* Globally, India's policy goal of achieving sustainable development is guided by the principle of 'common but differentiated responsibility' (CBDR). India is one of the countries that prefer an 'aspirational' rather than a mandatory or 'prescriptive' approach. India feels the issue of sustainable development should be approached with a sense of equity; and the development aspirations of the developing countries should be built into the green economy principles being evolved at the international level [16].

[15] 12th Five Year Plan, Planning Commission, http://planningcommission.gov.in/plans/planrel/12thplan/pdf/12fyp_vol1.pdf
[16] Ibid.

The CDM was seen by the global community as one mechanism that reconciles these dimensions through the private sector thereby enabling a holistic pursuit of sustainable development. Similarly for a developing country like India it was envisioned that the CDM will help advance sustainable development at the grassroot level.

From the time CDM was operationalized, India has been the second largest beneficiary of CDM projects (after China) with a total of 2857 approved projects by the National CDM Authority as on May 2012. The total number of Certified Emission Reduction (CERs) Units issued for this period amount to 722,950,490 metric tonnes of CO2 equivalent. Indian projects have a far greater thrust on infrastructural development than either Chinese or Brazilian projects, but with less technology transfer. India has been successful in relying on domestic technology to mitigate GHG emissions through CDM. In India, the technological benefit is focused more on the use of environment friendly technologies that are deemed appropriate as per local conditions by the project proponent. A fast growing economy is generally correlated to more international transfers. Such is not the case with India. It has the lowest technological transfer compared to fast growing economies like Brazil, China, and Mexico. (A brief on the Chinese CDM landscape is provided later in the report.)

The World Bank in its report, titled, "State and Trends of the Carbon Market, 2012", estimates that the total revenue through the CERs for the period for India projects alone would be in the region of Rs. 343,384 Million approximately[17]. The following table and graphs present a broad overview of the profile and sector wise distribution of the CDM Projects in India.

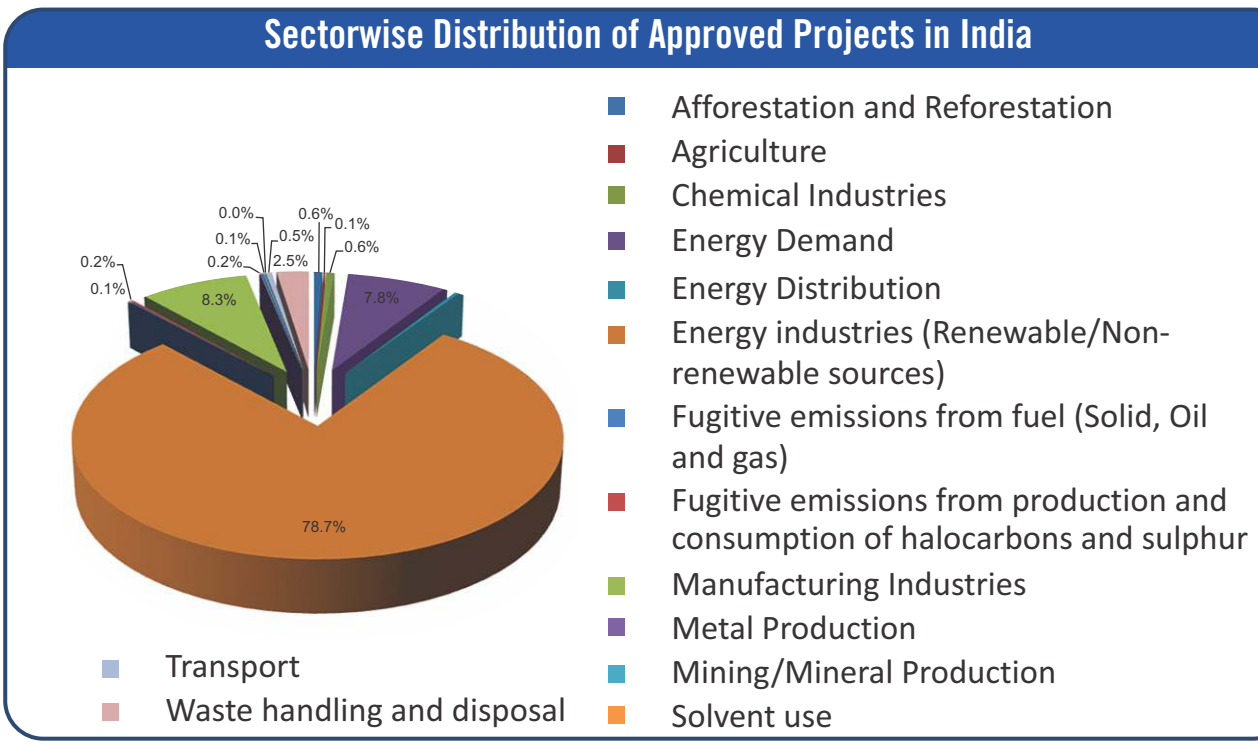
[17]http://siteresources.worldbank.org/INTCARBONFINANCE/Resources/State_and_Trends_2012_Web_Optimized_19035_Cvr&Txt_LR.pdf

TABLE 3- SECTOR WISE DISTRIBUTION OF CDM PROJECTS IN INDIA[18]

SL.NO.	NAME OF SECTOR	NO OF PROJECTS	CER UPTO 2012 (TCO_2 EQUIVALENT)
1	Afforestation and Reforestation	18	10,874,541
2	Agriculture	3	74,393
3	Chemical Industries	18	11,793,853
4	Energy industries (Renewable/Non-renewable sources)	2248	487,54, 615
5	Energy Demand	222	27,109,485
6	Energy Distribution	9	657,149
7	Fugitive emissions from fuel (Solid, Oil and gas)	3	165,438
8	Fugitive emissions from production and consumption of halocarbons and sulphur	6	82,095,771
9	Manufacturing Industries	237	64,405,361
10	Metal Production	5	5,425,126
11	Mining/Mineral Production	4	19,053,935
12	Solvent use	1	103,579
13	Transport	13	1,238,906
14	Waste handling and disposal	70	12,498,337
	Total	**2857**	**722,950,490**

Source: National CDM Authority of India

FIGURE 5- SECTOR WISE DISTRIBUTION OF APPROVED CDM PROJECTS IN INDIA[19]

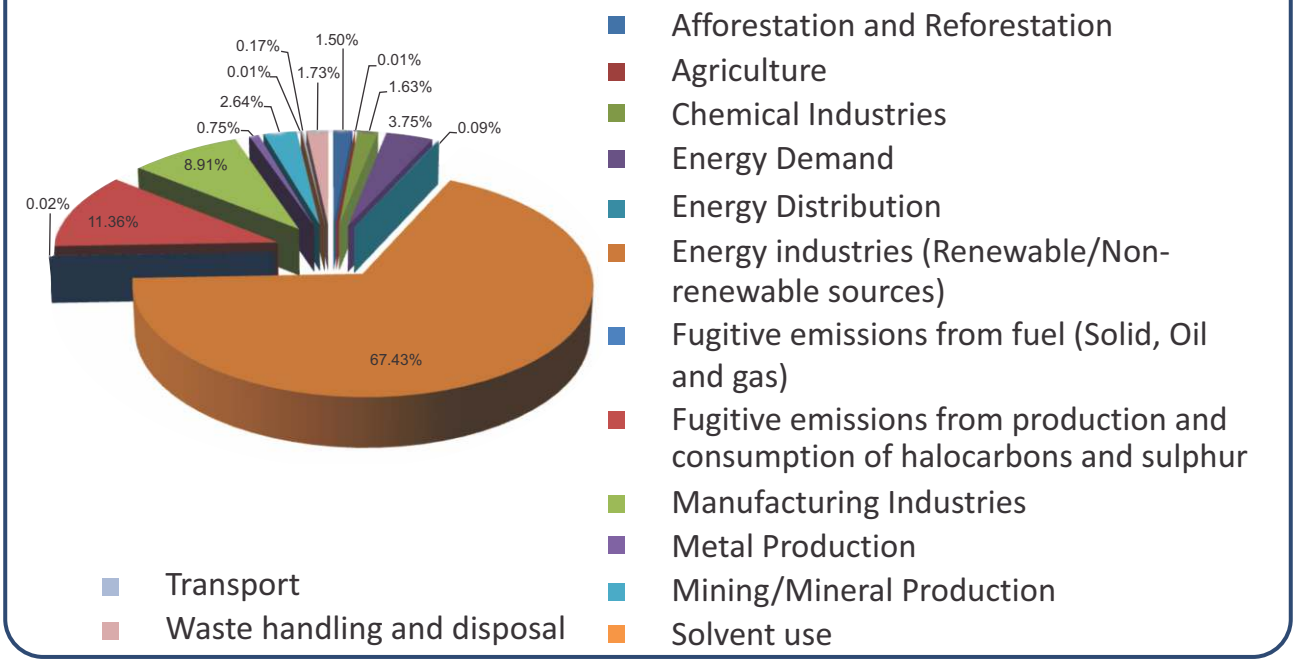


[18]Source- NCDMA available at http://www.cdmindia.gov.in/reports_new.php

[19]Source-Based on information collected from the National CDM Authority, Ministry of Environment and Forests, Government of India available at http://www.cdmindia.gov.in/reports_new.php?n=1

As can be seen from the figure above, out of a total of 2850 CDM projects in India 2479 (almost 87%) are in the energy sector. These projects are mostly dominated by the renewable energy sector where a lot of power generation projects are being developed to meet the gap in the demand and supply of electricity in India.

FIGURE 6 - SECTOR WISE DISTRIBUTION OF CER'S GENERATED UPTO 2012 IN INDIA[20]



Projects registered to mitigate emissions from the production and consumption of halocarbons and sulfur are only a handful in India (6 in total), however, they have produced 11% of the total CERs generated in India till date.

1.3.1 CDM Projects in India's states

The following table gives a state-wise distribution of CDM projects in India.

TABLE 4: GEOGRAPHICAL SPREAD OF CDM PROJECTS AND CERS EARNED (STATE-WISE)[21]

SL.NO.	STATE/UT	NO OF PROJECTS	CERS UPTO 2012	GROSS STATE DOMESTIC PRODUCT (IN INR CRORE)
1	Andhra Pradesh	210	86,823,972	432,112
2	Arunachal Pradesh	1	156,393	5,878
3	Assam	13	852,579	83,630
4	Bihar	9	750,896	164,121
5	Chattisgarh	105	27,368,203	86,133
6	Delhi	17	3,823,996	215,971
7	Goa	4	1,186,500	29,800

[20] Source-Based on information collected from the National CDM Authority, Ministry of Environment and Forests, Government of India available at http://www.cdmindia.gov.in/reports_new.php?n=1

[21] Source-Based on information collected from the National CDM Authority, Ministry of Environment and Forests, Government of India available at http://www.cdmindia.gov.in/reports_new.php?n=1

[22] http://planningcommission.nic.in/data/datatable/0306/table%2067.pdf

8	Gujarat	361	127,021,481	427,219
9	Haryana	37	4,512,243	188,033
10	Himachal Pradesh	96	17,273,314	44,480
11	Jammu & Kashmir	6	9,814,700	42,878
12	Jharkhand	32	24,046,731	105,597
13	Karnataka	254	69,699,588	296,658
14	Kerala	19	642,032	221,850
15	Madhya Pradesh	70	8,787,799	214,741
16	Maharashtra	370	61,620,089	843,565
17	Meghalaya	4	1,598,429	11,958
18	Multi State	189	26,771,333	-
19	Orissa	80	22,794,520	140,397
20	Puducherry	3	154,006	12,925
21	Punjab	74	12,157,425	162,337
22	Rajasthan	231	63,178,620	234,230
23	Sikkim	10	9,973,169	5,491
24	Tamil Nadu	368	51,950,734	451,313
25	Tripura	1	4,427,526	16,997
26	Uttar Pradesh	163	37,813,167	445,932
27	Uttarakhand	50	20,484,873	66,356
28	West Bengal	80	26,799,892	351,585
	Total	**2857**	**722,950,490**	

As we can observe from the table, Maharashtra has the highest number of projects whereas Gujarat leads on the basis of CERs earned. The states with a large number of projects are Andhra Pradesh, Chhattisgarh, Gujarat, Karnataka, Maharashtra, Rajasthan, Tamil Nadu, and Uttar Pradesh. The total number of projects in these eight states amounts to 2062, which is approximately 72% of the total CDM projects in India.

There are a total of 2857[23] approved projects across 28 states in India. The largest concentration of CDM projects is in the states of Tamil Nadu (368), Maharashtra (370), Gujarat (361), Karnataka (254) and Andhra Pradesh (210). The CDM projects in these states constitute about 55% of the total CDM projects approved in India. It is mainly due to the large concentration of industries in these states. The Table given below represents the state wise GDP by industries in India. It can be seen that the majority industries are concentrated in states like Maharashtra, Tamil Nadu, Gujarat, Karnataka, Rajasthan etc. The high GDP of states is reflective of the fact that they have a conducive environment to attract investors to establish industries in the state as compared low GDP states like Arunachal Pradesh, Nagaland, etc. Thus, the developed infrastructure also contributes to the large concentration of CDM projects in these states.

[23] http://www.ficci.com/spdocument/20308/Indian-CDM-Pipeline-Analysis-Book.pdf

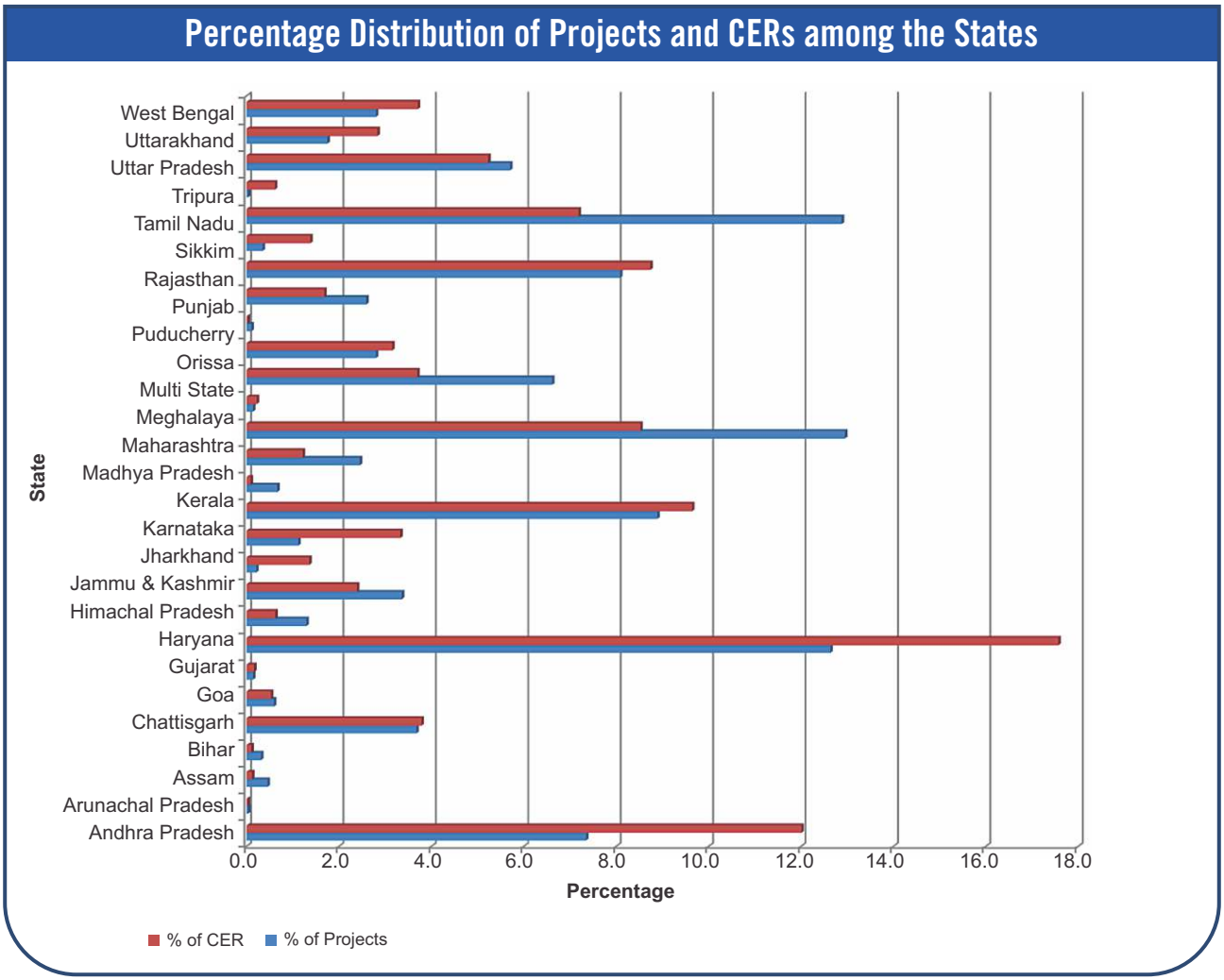
Of the renewable projects, majority of wind power projects are set up in the states of Tamil Nadu (196), Maharashtra (111), Gujarat (100) and Karnataka (74). The high number of wind projects can be attributed to many factors in the states, the foremost reason being the favorable geographical location. Tamil Nadu, Maharashtra, Gujarat and Karnataka have high installed capacity of 7154 MW, 2976 MW, 3093 MW &2113 MW respectively. Such a high installed capacity can be credited to the favorable policies in these states. For example, the states of Tamil Nadu and Gujarat have a comprehensive wind energy policy which encourages and attracts private investments, supports both off grid and grid connected renewable energy technologies, the high RPO targets set by the state for renewables (10% for Gujarat, 9.7% for Tamil Nadu) encourage the growth of renewable energy in the region.

Also a large number of solar CDM projects are set up in the states of Tamil Nadu, Gujarat, and Rajasthan, Karnataka etc. due to a high solar potential of the states mentioned above. The solar policy for these states also promotes investments with provision of financial incentives like electricity duty exemption, interest subsidies provided by the state. Moreover fiscal incentives like VAT exemptions, low interest loans reassure a favorable market for investors. The infrastructure support like land access, grid evacuation facilities and single window clearance of project create favorable conditions for the setting up projects in these states as compared to other states of India.

The Indian states which have biomass-based power supply projects are Karnataka, Andhra Pradesh, and Maharashtra. The strong state biomass policies developed in these states contribute to favorable investment climate in these regions. One of the principal factors behind lack of investment in bio power sector in states with high biomass potential is the Government policy. The fragmented nature of agricultural lands also does not allow high mechanization thus resulting in reduction of efficiency and increase in procurement cost for biomass projects in these states.

The following graph shows the percentage distribution of number of projects and the CERs earned by the states up to May 2012.

FIGURE 7: STATE-WISE DISTRIBUTION OF PROJECTS AND CERS IN INDIA



Thus we can conclude that a large number of projects in a state does not always mean that the CERs earned will also be correspondingly more. Different sectors bring into play different amount of CERs as has been discussed in the previous section where 6 projects registered to mitigate emissions from the production and consumption of halocarbons and sulfur earns 11% of the total CERs.

1.3.2 CDM Projects in India and States – Is there a link between the projects and Government of India's definition of Sustainability?

An overview the CDM projects in India, viewed from the perspective of how India defines "Sustainable Development" as articulated in the 12th Five Year Plan Document, reflects that the distribution of projects have more or less toyed the line of the Government's current philosophy of "growth and development and double digit GDP". However, the projects are not

based on the core principles of sustainable development, as articulated in the various ongoing discussions at the United Nations forum for a post 2015 sustainable development goals. More details of it is given in the following sections of the report, which contains a detailed analysis of various on-going CDM projects.

1.3.2 Landscape of CDM in China

The Designated National Authority (DNA) for China is the 'National Development & Reform Commission '(NDRC), under the NDRC is the 'National Leading Group for Climate Change' (NLGCC) which is responsible for reviewing and coordination of important CDM policies. Although the National Development and Reform Commission (NDRC) is the official designated national authority in China, various ministries are also involved in the policy-making process regarding climate change issues and the CDM.

China's objectives in relation to the CDM are reflected in the "Measures for Operation and Management of CDM Projects in China," which were enacted in October 2005. These "CDM Measures" were issued together by the NDRC, the Ministry of Science & Technology, and the Ministry of Finance of China.

The key objectives for China in the context of the CDM are as follows-

a) Explore the business opportunities in reducing GHG emissions and to establish China as one of the leading CDM markets in the world.

b) Utilize the CDM for its own priorities, which are:
   (i) The improvement of energy efficiency
   (ii) The improvement of its energy infrastructure in remote, and sometimes underdeveloped areas.

China has not established any particular criteria for sustainable development for the CDM projects, but sustainable development benefits are expected out of projects that fall into the priority areas defined by the Chinese government: energy efficiency improvement, development and utilization of new and renewable energy sources, and methane recovery and utilization (Article 4 of the Regulations)[24] . To channel the CDM projects in the national priority sectors, the Chinese government has imposed taxes on CER revenues that differ by project types; e.g. 0% for N20 projects, and 65% for HFC and PFC projects. The revenue collected from these is deposited in the CCF. Another interesting aspect of the Chinese CDM rules is an ownership rule that allows only those companies that are 51% under Chinese ownership to access the CDM. Similarly, many renewable energy projects require a certain level of "local content" within the equipment utilized for the project.

[24] Varieties of Carbon Governance: Utilizing the Clean Development Mechanism for Chinese Priorities, The Journal of Environment and Development, http://jed.sagepub.com/cgi/content/abstract/18/4/371

Besides this, China also has the China CDM Fund (CDMF), which was established on March 2007 under the Ministry of Finance. The CDMF was launched with a budget of $3 billion on November 2007. The CDMF has received funding and is supported by organisations like the World Bank, Asian Development Bank and other international agencies. The CDMF was not established solely for the CDM market, but also for other programs of the Chinese government to combat climate change. The CDM fund supports programs related to climate change, renewable energy and other activities related to climate adaptation and mitigation.
China is the largest supplier of carbon credits to the world, it accounts for 60% of the global market alone. The number of approved CDM projects sums up to a total of 5058 projects (till June 2014), the table below provides a list of the number of approved projects for the different sectors.

Table 5 below gives a sector-wise composition of CDM projects in China. Out of the approved projects, there are 3802 registered projects for China. It can be seen that the priority areas for CDM projects in china are development of renewable energy, efficiency, methane recovery and utilization. The renewable energy projects constitute a major share of registered projects in China, followed by the CDM projects in the Energy saving and efficiency improvement sector. In the renewable energy sector, the small hydropower projects, dominate followed by the wind power projects. Total CERs generated annually by China for registered CDM projects is 628,372,943 tCO2e the renewable energy project are expected to generate the highest amount of CERs amongst the CDM projects.

TABLE 5: SECTOR WISE CDM REGISTERED PROJECTS IN CHINA

NAME OF SECTOR	NO OF PROJECTS
Renewable energy	3172
Energy saving and efficiency improvement	254
Methane recovery & utilization	236
Landfill burning power generation	35
Fuels substitute	26
N2O decomposition	43
Chemical pollutants reduction (HFC-23)	11
Afforestation and reforestation	4
Others	21
Total	**3802**

Source[25]: Department of Climate Change, National Development and Reform Commission, China

[25] http://cdm-en.ccchina.gov.cn/NewItemTable9.aspx

TABLE 6: EXPECTED AVERAGE ANNUAL CERS BY SCOPE FOR REGISTERED CDM PROJECTS IN CHINA

SCOPES	AVERAGE ANNUAL REDUCTIONS (TCO2E)	SCOPES	AVERAGE ANNUAL REDUCTIONS (TCO2E)	SCOPES	AVERAGE ANNUAL REDUCTIONS (TCO2E)
Energy saving and efficiency improvement	52,289,555	Renewable energy	399,609,402	Fuels substitute	18,546,998
Methane recovery & utilization	52,308,495	N2O decomposition	28,181,743	Chemical pollutants reduction (HFC-23)	66,798,446
Landfill burning power generation	5,913,492	Afforestation and reforestation	156,486	Others	4,568,326

Source[26] : Department of Climate Change, National Development and Reform Commission, China

The sustainability claims by China can be understood from a report published by the UNFCCC 'The Benefits of Clean Development Mechanism 2012' where a study was conducted across different host countries including China, to find the sustainable development contributions and area of focus for sustainable development. This[27] report analyzed approximately 4,000 registered CDM projects worldwide (excluding programmes of activities) according to four areas: sustainable development, technology transfer, finance and regional distribution.

The study assessed the assertions made by project proponents in the project design documents submitted for registration. It was found that for China, economic development was given prime importance in all the projects, with a high percentage of PDDs focusing on stimulation of local economy and infrastructure development. Technological development was also found to be a major focus area of focus for China, and it has been one of the top five technology suppliers for CDM projects from amongst countries like Germany, USA etc. especially for hydro projects. The environment development aspect was concentrated on the preservation of natural resources and was given lesser importance than economic development. Social development was given the least importance in all the CDM projects in China.

[26] http://cdm-en.ccchina.gov.cn/NewItemTable10.aspx
[27] https://cdm.unfccc.int/about/dev_ben/ABC_2012.pdf

2.The Study and the Methodology Adopted

2.1 The Study:

In the backdrop of the above, this study was to undertake a detailed analysis of various CDM projects in India, from the perspective of whether these projects have truly contributed and contributing to putting India and their respective sectors on a sustainable development pathway. Further, to analyze as to how these projects have benefitted communities from a socio-economic and environmental perspective.

In other words, the basic premise of the study is to assess, if the general perception about all CDM projects in developing countries that they do not necessarily meet the sustainable development goals as outlined in the Project Design Document (PDD) is correct. Further, the study also assesses, if the second popular perception on CDM projects, that is a means to enhancing profits of private sector companies, through an additional stream of revenue generation through CERs, true, or are they actually using the additional revenue to ensure overall socio-economic and environmental development in the areas they operate.

2.2 The Methodology:

Therefore, in order to assess how far the CDM projects have actually facilitated local development and kept the promises as outlined in their PDDs, it was decided to conduct field visits to the project sites and validate the claims outlined in the PDD.

To begin this exercise, eight sectors were identified and a comprehensive database of projects in the selected sectors was compiled for all the states in India. Based on the information collected in the database, 10 states were identified and projects within these sectors were selected for carrying out the assessment. The projects in this database were compiled on the basis of the scale of the projects, their location, nature of the projects etc. Additionally, availability of local partners in the area was also examined for facilitating the interaction with the company representatives and stakeholder consultations with villages around the project site. The projects shortlisted for the field visits were selected based on the typology developed through the CDM project database.

The identified sectors are as follows-

1. Wind
2. Biomass
3. Solar
4. Run of the river large hydro
5. Thermal/Supercritical
6. Energy Efficiency
7. Afforestation/Reforestation
8. Municipal solid waste/cogeneration

The following table shows the selected states and the projects covered for the database based on their ownership status:

STATE	GOVERNMENT	PRIVATE	COMMUNITY	TOTAL
Chhattisgarh	3	42	0	45
Himachal Pradesh	6	52	0	58
Assam and Arunachal Pradesh	6	20	0	26
Jharkhand	0	6	0	6
Gujarat	27	173	0	200
Andhra Pradesh	2	59	0	61
Rajasthan	7	179	0	186
Maharashtra	1	198	3	202
Karnataka	9	143	4	157

The field visits were conducted with the intent of understanding the ground reality of the project location from a social, economic, and environmental lens. As is mandated by the UNFCCC, one of the key principles of the CDM is to ensure that the projects promote sustainable development in the project area and ensure overall development of communities in the vicinity of the project.

The field visits consisted of interaction with local communities (through focused group discussions) and company representatives to understand the role and impact of the CDM projects on social, environmental, and economic development in the region. This information was corroborated with the sustainable development benefits as outlined in the PDDs, and the gaps in the reality and the promises were used to develop a set of recommendations for the UNFCCC to further strengthen the CDM.

Further, to validate the field study, we also collected and assessed various data and indicators such as the Human Development Index for two different points of time, infrastructure access data from census 2001 and 2011 and other available data from various ministries and departments.

Since, access to data at the district and village levels are not easy, the study did have a challenge in getting any direct corroboration from the data to what we heard / learnt from the field visits, but, nevertheless, based on the data collected from the state levels and some sketchy data from the district levels, we were able to get an overall sense of the extent of development in areas where the CDM projects are located and also make the link between community perception with the data on development.

The map of India placed below indicates the CDM projects covered as part of this study along with their geographic locations.

FIGURE 8: MAP OF INDIA INDICATING THE VARIOUS CDM PROJECT LOCATIONS

The CDM projects in our study were covered in three phases. The sectors covered for the study were diverse, with projects ranging from renewable energy like wind, solar, and biomass to afforestation projects. The sustainable development benefit claims outlined in the PDDs of these identified projects were analyzed. The technological well being, dimension was also included as the part of the study as the Nodal agency for CDM projects in India, the Ministry of Environment and Forests recognizes the importance of technological growth within the country to achieve the goal of sustainable development.

The sustainable benefit claims of the CDM projects were analyzed across the 4 dimensions, namely the social, economic, environmental and technological well being. In this study, a set of indicators for each dimension was derived from the claims made in the various PDDs for registered CDM projects. These indicators are outlined against each dimension (see Table 8) to allow a clear distinction between them and also allow the claimed benefits to be assessed uniformly.

TABLE 8: LIST OF INDICATORS USED FOR EACH DIMENSION FOR THE STUDY ON SUSTAINABILITY CLAIMS BY CDM PROJECTS

DIMENSION	INDICATORS
Social	Improvement of health, safety & Education
	Poverty alleviation & Women empowerment
Economic	Stimulation of Local employment
	Improvement to Infrastructure
	Attracting Investment opportunities /Revenue Generation
	Improvement of Power scenario/ Contributing to the National energy security
Environment	Reduction of Pollution
	Promotion of Reliable & renewable energy
	Preservation of Natural resources
Technology	Provision of Environmentally safe & sound technology
	Contribute to the technological growth of the country

The Indicators for each project were marked under each dimension. The sum of all the indicators for each dimension was calculated, and then represented sector wise for the 25 CDM project covered in the study.

One of the key objectives while analyzing the sustainable development claims in the PDDs was to determine which dimensions are given more importance by the project developers. Each dimension outlined in the PDD was examined in detail for comparison with the ground reality, and additionally with the sustainable development focus of the company.

To assess the sectors, the identified indicators were tabulated with each indicator assigned the numerical value '1' and these were then aggregated for each dimension. Subsequently the aggregated values for each dimension were plotted on a graph to gauge the sustainable development focus of the project developers in each of the identified sectors.

The final tally of the points for the various dimensions across different sectors gave us a clear picture of how each sector faired in addressing sustainable development.

3. The results:

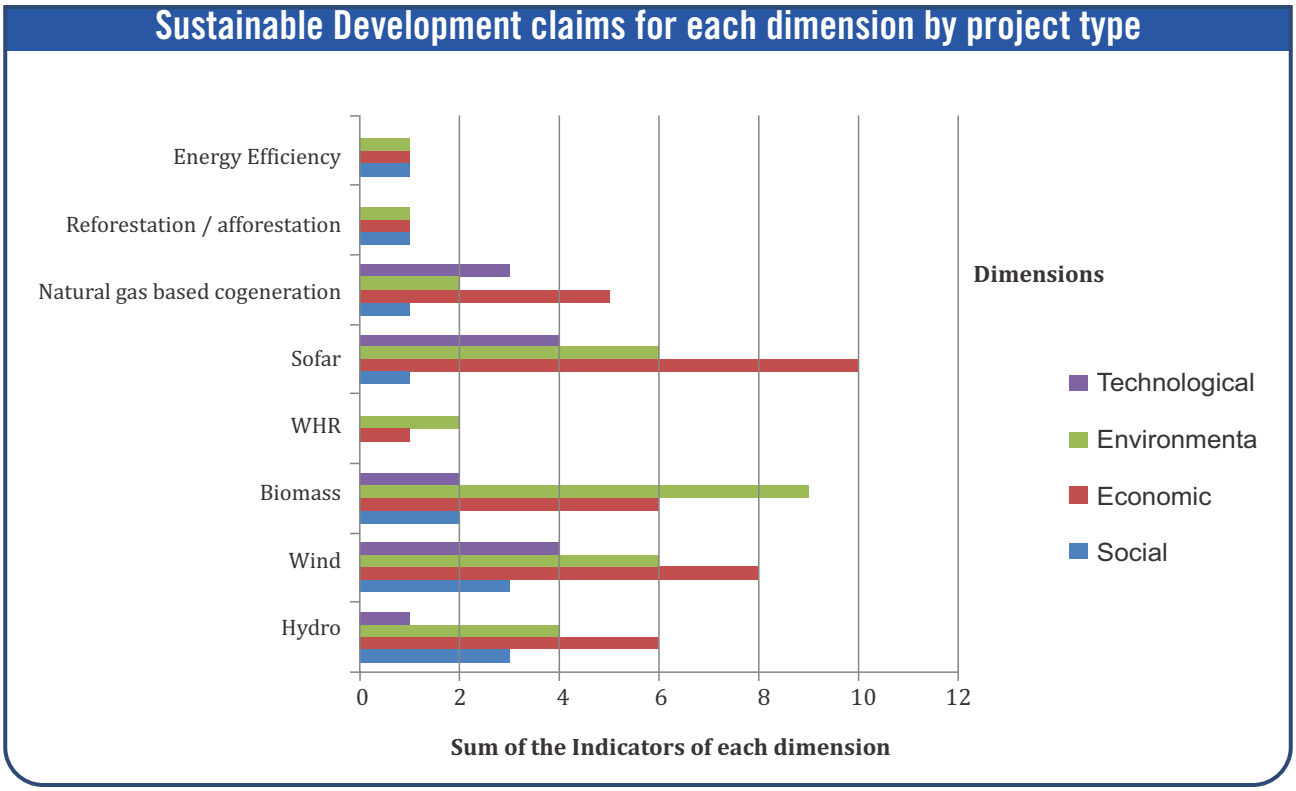
The results of the study is based on our analysis of the visit of the following CDM project sites, along with interaction with various stakeholders and members of communities residing in and around the project sites.

STATE	SECTOR	PROJECT NAME
Andhra Pradesh	Natural Gas/Thermal	1. Grid connected natural gas based power plant at Kakinada, Andhra Pradesh
	Energy Efficiency	2. Energy Efficiency Measures at Paper Production Plant in India
	Biomass Cogeneration	3. 4.75 MW biomass residue based cogeneration project in East Godavari district of Andhra Pradesh by Sri Lalitha Enterprises Industries Pvt. Ltd.
Rajasthan	Solar	1. Grid connected solar PV power plant in Jodhpur, Rajasthan 2. Greenhouse Gas Emission Reductions through Thermal Solar Power Technology - Rajasthan Sun Technique Energy Pvt. Ltd
Karnataka	Waste to Energy	1. Integrated treatment facility for Municipal Solid Waste at Bangalore, Karnataka, India. 2. Biomethanation of Municipal Solid Waste (MSW) by Terra Firma Biotechnologies Ltd., Karnataka, India
	Solar PV	3. 3MWp Grid Connected Solar Power Project at Yelesandra Village, Kolar District, Karnataka, India
	Municipal Energy Efficiency	4. Karnataka Municipal Water Energy Efficiency Project.
Maharashtra	Wind	1. Priyadarshini - Pertinent Wind Power Project in Maharashtra 2. 15 MW grid connected wind electricity generation project by Aryan Coal Benefications Pvt Ltd., New Delhi
	Biomass Cogeneration	2. Pandurang SSK RE Project

Gujarat	Cogeneration	1. Sintex 7.5 MW Natural gas based package cogeneration project, Gujarat – India
	Solar	2. Solar Power Plant of 15MW in Gujarat by Palace Solar Energy Private Limited
	Wind	3. 51 MW wind power project of ONGC at Surajbari, Gujarat
Himachal Pradesh	Energy Efficiency	1. Atal Bijli Bachat Yojana (ABBY); Lighting Efficiency project in the state of Himachal Pradesh, India, implemented by Himachal Pradesh State Electricity Board.
	Afforestation/Reforestation	2. Himachal Pradesh Reforestation Project – Improving Livelihoods and Watersheds
	Hydro	3. Hydroelectric Project in Kinnaur District in Himachal Pradesh 4. Hydro electric power project by SJVNL in Himachal Pradesh
Chhattisgarh	Afforestation/Reforestation	1. Reforestation of degraded land in Chhattisgarh
	Hydro	2. 7 MW Hydel Based Power Unit on River Jatashankari, Chhattisgarh
Jharkhand	Cogeneration	1. Biomass based cogeneration project at Bhagwati Vintrade, Ramgarh, and Jharkhand, India
	Sponge Iron	2. Usha Martin Limited - Waste Heat Recovery Based Captive Power Project activity
Assam	Biomass Cogeneration	1. 2.59 MW CESIPL Renewable Power Generation Project, Sonitpur, Assam,
Arunachal Pradesh	Hydro	Desang Hydro Power Project at Assam, India and Demwe Lower Hydro Electric Project, Arunachal Pradesh

The detailed results of the project is summarized in this section, starting off with the first aspect of analysis of sustainable development claims for various sustainability dimensions, project wise.

FIGURE 9: SUSTAINABLE DEVELOPMENT CLAIMS FOR EACH DIMENSION, BY PROJECT TYPE



The figure above is a representation of indicators for each dimension across 8 sectors covered in the study.

This analysis is based on the following:
It can be noted that for renewable energy sectors like the wind, solar, biomass etc. the economic dimension of sustainable development gets the most importance. Most of the companies primarily claim to provide direct and indirect employment generation opportunities, infrastructure development, revenue generation etc to achieve economic well being in the area.

If we consider one of CDM projects of our study, "The Pandurang RE project", a biomass project located in Maharashtra, it was observed that the company generated indirect employment opportunities in the area, by paying a fixed price (Rs 2300/ton) for the sugarcane, sold to the company by the villagers for biomass generation. In case of many CDM projects the companies failed to provide direct employment to the villagers due to lack of skilled labors in the area.

In several renewable energy projects, it was found that the infrastructural development claims have not been fulfilled, for example the "51 MW wind power project of ONGC" at Gujarat, the development of rural infrastructure like roads is restricted within or around the project plant, rather than the entire project location.

The second most popular claims were made in the environmental dimension of sustainable development with renewable energy projects mostly laying emphasis on the promotion of reliable and sustainable energy indicator. The CDM projects also laid emphasis on the reduction of the GHG emissions, and also focused on removal of environmental and noise pollution.

The technological claims were mostly concentrated on the technological growth in case of several RE projects, as new technologies like "Grid connected solar PV power plant in Jodhpur, Rajasthan" where the technology used is the thin film solar photovoltaic technology for power generation. The overall indicator used for technological being has been 'Provision of Environmentally safe & sound technology' for all CDM projects.

The social dimension of stakeholders is least considered during the development of a CDM project. In case of "51 MW wind power project of ONGC at Surajbari, Gujarat in India", the company claims to bring a total change in the living standard of the village by provision of employment opportunities, health facilities, infrastructure development etc. However the situation is different on the ground, the claims were found to be false as no educational and the company has never provided health facilities. Most of the project proponents that claimed to provide educational and health facilities; however, the project location already had primary medical centers and schools set up in the area. The economic and environmental benefits far exceed those of social benefits. Thus, it can be concluded that the companies focus mostly on economic gains from a CDM project, overlooking the social dimension of development. In case of projects related to reforestation/afforestation it was found to cover all dimensions of well-being. The economic dimension is most prominent in renewable energy projects.

Overall, in case of the economic benefit, the generation of employment and infrastructure development indicator was claimed more than the other indicators. In case of environmental benefit, the reduction of pollution and promotion of new and renewable energy was claimed more than other indicators for renewable energy sector projects like wind, solar, etc; whereas, in case of afforestation/ reforestation projects the preservation of natural resources was claimed as a major indicator. The renewable energy projects have also claimed the promotion of technological growth as a major indicator for the technological well being, to achieve sustainable development. In the social dimension, the poverty alleviation and women empowerment have been claimed as the major indicator to assess the social development, brought by the CDM project but direct evidence of these was unavailable on the ground. However, the social benefits are extremely difficult to assess, since there is no physical evidence on the ground that suggests their resulting from the project activity.

3.1 People's perception- Evidence from the ground

The field visits have played a significant role in understanding the local stakeholder's perspective on the developmental aspect of the CDM projects. The projects that were covered as a part of our study showed that there exists a wide disparity between the claims made by the private developers and their implementation on the ground.

Most project developers did carry out lengthy stakeholder consultations informing the local residents about the upcoming project activity; however, during the field visits the villagers claimed that promises made prior to the installation of the project activity have mostly not been followed by the company. One positive aspect of project development especially in renewable energy projects has been the increased supply to the local grid, ultimately strengthening the local power grid in the region, projects like: Greenhouse Gas Emission Reductions through Thermal Solar Power Technology - Rajasthan Sun Technique Energy Pvt. Ltd in Rajasthan took one step further in this direction and provided facilities through smaller modules of panels to houses for the BPL categories in the villages. In some projects infrastructural support has been provided in the form of construction of roads, schools & health centers around the project site. For example, in the "Grid connected solar PV power plant in Jodhpur, Rajasthan", the school infrastructure has been developed by the company by providing tables, chairs, computers etc. Similarly, the "Grid connected natural gas based power plant at Kakinada, Andhra Pradesh" follows a Sustainable Development Plan which has improved the lives of the of the local population around the project area by focusing on overall improvement in the education, economic, and social setting. The village of Dummulapeta has been the beneficiary of the services of the project developer, as the government owned village school has been improved in the area with the construction of a Pre school for children, added infrastructural support in the form of computers and fans. Besides this free medical camps and free medicine distribution has been carried out by the company which has aided in the all round development of the village. But the case seems to be contrasting in case of another project site, a village named Yettimoga, where the company has absolutely not stood by its claim to act as a catalyst of development in the region, instead conditions have worsened in the area with fish population decreasing and increasing the migration of the local people from villages near the project site. However, these depleting natural resources cannot be attributed to the CDM project activity because the project lies in a government designated Special Economic Zone (SEZ) where the presence of a large number of heavy industries has contributed to damaging the local ecology and the government has also enforced a temporary ban on fishing in the area, thereby affecting local livelihoods.

Moreover, around most of the project sites the locals also felt in case of several project activities infrastructural support such as rural roads, access to market facilities etc. as promised by the developers was mostly restricted around the project site.

The most commonly observed disparity was in terms of economic development claims in these regions. Majority of the PDDs of projects such as the "15 MW grid connected wind electricity generation project by Aryan Coal Benefications Pvt Ltd", saw the company outline the provision of employment opportunities for erecting the WTGs and their maintenance and manufacture, these claims have been contradictory, as most villagers in the area were found to be unemployed primarily due to the lack of skilled labour in the area. In the case of " Sintex 7.5 MW Natural gas based package cogeneration project, Gujarat – India" it was observed that in one of the project sites, Village Sari, only 10 people were employed by the project developer, gender inequality in providing of opportunities was observed, however in another project site known as Village Arshodia the rate of employment was high with 50 villagers being employed by the company.

Finally, if we consider the project "51 MW wind power project of ONGC at Surajbari, Gujarat in India", the employment rate was low as only 25 villagers were employed at the project site, although the energy access showed improvement, with project sites like village Budiya and Sindhali receiving 24 hours of electricity supply. Thus, in a nutshell, these projects claimed that the project activity will generate direct and indirect employment opportunities in the area, but on the contrary the ground reality demonstrated that the employment offered by the company is mostly seasonal or contractual and has been lower when compared to what was promised by the company. Most villagers complained that the companies failed to provide them any direct or indirect employment opportunities. There was a common grievance of more skilled and technically qualified labor being hired from other regions instead of engagement with the local community.

In case of many CDM projects, particularly the cogeneration power plant projects such as the "Biomass based cogeneration project at Bhagwati Vintrade, Jharkhand" and "Pandurang SSK RE Project in Maharashtra" it was witnessed that the waste generation and disposal caused discomfort to the community, lowered the agricultural productivity and posed a serious threat to the local environment of the region. In the case of the biomass project in Jharkhand, Village Bongabar, it was recorded that the villagers faced a major problem regarding the disposal of rice husk in the area, the rice husk besides degrading the agricultural productivity also depleted the ground water availability in the region. The sugar mills constructed as a part of the Pandurang RE project, raised certain health issues in the region, the effluents discharged into the river led to degradation of water quality of the region, thereby making it unfit for

drinking purposes for the villagers. Moreover, the contaminated water also served as a breeding ground for mosquitoes in the area, thus affecting the overall well being of people in the area. The development of education and health centers was found to be unsatisfactory in case of a number of project activities like the “Priyadarshini - Pertinent Wind Power Project in Maharashtra”, where the company did not contribute much to improve the social infrastructure of the project site. During our discussions many developers stood by the claims made in the PDD, however upon visiting the site and speaking to the locals it was found that they have faltered to reach the expected level of the promised development.

During our field visits and discussions with the villagers it was found that most of the problems cited by the villagers around the project sites are problems endemic to the existing social system and cannot be attributed solely to the CDM project activity. Issues such as contractual labor and gender-based wages are a social ill that these CDM projects could possibly address; however the developers have chosen to maintain the status quo. However, the people’s perspective holds key importance in understanding the strengths and faults of the CDM implementation in India. The local stakeholder’s opinions can prove to be significant in addressing the flaws in the system. The inputs obtain can be productively used in creation of a sustainable development standard which addresses the issue of sustainable development effectively.

3.2 Select best practices

Since sustainable development is not focused on the present but also takes into account the needs of the future generations, it is imperative to look at select best practices that we came across during our field visits

One noteworthy mention would be GMR's natural gas based plant situated at Kakinada, Andhra Pradesh. The PDD has outlined a Sustainable Development Plan (SDP) for the villages near the project site as a part of their Corporate Social Responsibility (CSR) activity, which concentrates on the total development of the region. The Sustainability Development Plan is a roadmap to help the private developers, local developers, to bring their services in line with the sustainable practices, thereby improving the quality of life of all the community members. It provides vision for the future development and helps to bring everything under a set of goals and targets. The SDP typically concentrates on the local needs of the area and devises ways of redressing the problems faced in the region.

The areas concentrated upon while preparing the SDP are the social, economical, environmental facets of the region. The social aspect concentrates on issues of social equity, education, health & safety, whereas the economic aspect focuses on the employment and revenue generation of the local community, the environmental aspect concentrates on the

planning and design of proper utilization of natural resources and improving the quality of local environment in the region. The SDP outlined in the GMR project has been laid down according to the guidelines of the Ministry of Environment & Forests and therefore contributes about 2% of the CER revenue for the community and social development. The 2.6 crore INR investment is a part of the broader CSR activities undertaken by the project developer. The CSR activity is spread across three villages near the project site. The PDD focuses on social development of the community through activities like the construction of Balawadis, provision of financial assistance to schools, improving access to medical care. Several other CDM projects like the Biomass cogeneration plant by Sri Enterprises Industries Pvt. Ltd, Energy efficient paper production plant in Andhra Pradesh, Solar thermal project in Rajasthan etc have benefitted local communities by carrying out CSR activities.

Some CDM project activities have aided in the economic development of the region not only by the provision of employment opportunities for the community but also have supported the farmers by provision of additional revenue streams. One such example is the 'CESIPL cogeneration plant' in Assam, where the project developer has developed a payment and barter system for sourcing the agricultural waste from the farmers. This system provided both a revenue stream for farmers and benefitted the farmers with the use of organic fertilizer for the crops.

The Demwe hydropower project in Arunachal Pradesh, is a CDM project where social development has been given due importance in the PDD. The project developer has kept in mind the Rehabilitation problems of the community displaced during project construction. The Rehabilitation and Resettlement activities and the local development plan seek to address the grievances of the displaced people and thus work towards helping them and providing them improved livelihood and standards of living.

CDM project activities in the afforestation and reforestation sector have been known to show tremendous change in the local environment of the region. One such example is the A/R projects in Chhattisgarh, where the afforestation activity has led to the increase in soil fertility, rise in water table benefitting the overall landscape of the region.

4. Key Findings

Broad Overarching Findings:

- In general, the benefits of availing the Carbon Markets, if any, have largely been restricted to the company or the project promoter per se, with very little actually being passed on to the communities.

- In most cases, the actual benefits to the communities and public at large, as outlined by the company in the various Project Documents, have not fully been translated to actions that benefit communities.
- In most cases, the sustainable development benefits as outlined in the various PDDs are loosely defined by the companies, and the impact of most CDM projects on indicators such as poverty and employment was found to be insignificant.
- The companies are implementing the promises as made in the PDD, but mostly for only a few villages around the project site and not for all of them.
- Companies are implementing the social, economic, and environmental benefits through. their Corporate Social Responsibility (CSR) divisions, and that too very irregularly and nothing that actually promotes sustainable development. In many cases, we found that there could be an overlap of activities done through CSR and part of their indicated actions as stated in the CDM Project Development Reports. However, clear lines of distinctions have not been drawn between the two.
- Most companies have held stakeholder consultations with the local stakeholders and informed them about the project activity and its sustainable benefits. However, there seems to be a mis-match between people's expectations and the actual delivery. It has been difficult for us to judge, if the expectations of people were more than what was promised, but, nevertheless, there is a fair amount of resentment by communities on what they have got from the companies.
- Some of the CDM projects that were visited had not been validated yet, or were still under construction. Therefore, the gap between their sustainable development claims and the ground reality could not be determined.
- There is no monitoring and evaluation system in place at any stage of the CDM process to determine the progress on sustainable development resulting from the project activity.

Specific Observations/Findings:

- Most sustainable development claims (especially for employment) are ambiguous and open ended. For example, the PDDs claim that the project activity will generate employment in the area and lead to social upliftment of the communities, however most employment generated is of a contractual or seasonal nature.
- Employment offered at most of the project sites to communities are, usually menial jobs such as "guards", "helpers" and so on. Even jobs, that require some basic competencies like "drivers" have not been offered to local communities.
- There have been some indirect employment benefits in the case of some projects, particularly, co-gen based projects, which have helped sugar-cane farmers to benefit from locally available market for their sugar cane. However, there are very conflicting views on the actual price of sugar cane paid to farmers. While companies claim that they have a

minimum support price for sugar cane, which is based on the prevailing market prices, local farmers have claimed that, it is far less than the market price.

- As part of the project activity, companies have helped local communities by renovating primary schools and associated infrastructure, conducting health check-up camps, and carrying out plantation drives. However, the benefits of these activities are difficult to measure and seem extremely sporadic.
- However, what clearly emerged is that the amount of money spent on these projects, did not definitely is even close to the amount that companies have promised to invest for community development, as stated in some PDDs, as part of their revenue sharing from CDM proceeds for community development.
- Most project documents have talked of improved infrastructure access, particularly, roads. However, our observation in most of the project sites and the surrounding areas that we visited, the road infrastructure was particularly bad, except for certain approach road to the project office or the actual project site. There seems to be an issue of who is responsible for the road infrastructure. While technically, it is the municipal or district authorities, who should be responsible for the development and upkeep of road infrastructure, we understand from communities, that, due to heavy traffic load for the project purposes, road infrastructure have deteriorated steadily and hence, they believe, it is the onus of the company to help in maintaining good road infrastructure. This claim of communities seem to be right, since, in most cases, companies have specifically stated this in their PDDs.
- In the case of areas, where energy CDM projects, such as solar, wind, hydro etc. are located, one would imagine that surrounding villages are benefitted by the power generation, as generally the evacuation of energy generated are from low voltage lines. However, in the case of most projects, we found that not all surrounding villages/hamlets had access to grid electricity supply.

Other major issues but systemic in nature:

While it is not possible to directly attribute it directly to the companies or the CDM project proponents, a number of issues have come out during the field visit and interaction with communities, relating to:

- Land acquisition
- Land pricing
- Rehabilitation and re-settlement of displaced communities

Some of the major issues that were brought to our notice from communities were:

a) Not all of the land identified for projects such as wind and solar are/or were particularly barren lands, as has been indicated in most of such Project Documents.

b) A number of land where such projects have come up, were, according to communities, quite fertile. A typical example is that of Charanka village, Gujarat, where the largest solar

farm has been set up. We were informed that the area was known for its rich cultivation of sesame seeds, which have a good market price.

c) There seems to be a huge mismatch between the prices that communities got for forgoing their land for projects, as against what price the Government had notified for land acquisition. In some project cases, we found that while the actual Gazette Notification Price fixed for an acre of land was in lakhs of rupees, farmers actually got only a few thousand rupees. There could be a number of reasons for this, and many of these are systemic in nature. But, it is being flagged, as something that needs to be addressed on a war footing, as cases such as land grabbing are very rampant across the length and breadth of India.

d) In many cases, land acquired for projects have led to destruction of community water bodies, which had for long been the source of water supply for the communities for meeting bulk of their water requirements.

e) In many cases, where projects, particularly the Hydro projects, involved rehabilitation of communities, the resettlement and rehabilitation plan has been very poorly implemented and in some cases, communities who have been forced to leave their land, are yet to be completed resettled. Many of them continue to be unemployed.

f) Other issues that have come up, include, land acquisition for waste dumps, in the case of waste to energy projects. These waste dumps do not follow any laid down principles for pollution control by the Pollution Control Board and are the root cause for a number of health related problems faced by communities.

g) Issues related to mass environmental and forest destruction, particularly for setting up wind farms have been observed.

5. Recommendations:

We are now in an economic order that is largely run by market forces, whether we like it or not. This cuts across all sectors of economy, globally and even countries that were opposed to a market based economy have now been forced to shift to it, since it is now a global economic order.

However, for a long time there continued to be fairly stiff opposition to impose market economies cutting across all sectors, and proponents of non-market based economies felt that some sectors needed to be protected from the penetration of a market economy.

Similarly, when the Kyoto Protocol was being negotiated, a number of groups, were totally against the Clean Development Mechanism (CDM), a market based measure to promote sustainable development. Their major issue against the CDM, was that it would result in industrialized countries investing small amounts of money in developing economies for projects that are deemed “low carbon”, to meet their carbon emission reduction as envisaged

under the Kyoto Protocol, while not making enough efforts to domestically reduce their carbon emissions.

Since a large number of countries were sold to the idea of a market based measure to address emission reductions, the CDM became a reality and countries such as India and China were beneficiaries to a large number of CDM projects.

However, for some time now there has been a realization that the CDM projects have not necessarily led to the promotion of sustainable development and also the realization, that not all countries have had an equal access to CDM project sanctions. Therefore, a lot of thinking has gone into the whole CDM mechanism and a number of countries and experts in the field have proposed to revamp the entire CDM mechanism and process and put in place systems that would ensure the promotion of sustainable development policies and programmes and also ensure that all countries have equal access to projects under such schemes/programmes.

Notwithstanding this, no matter what the revamp process would result in, it is very clear that the market-based system would continue to stay.

In the backdrop of the above, the following are some of the recommendations, most of them coming from our own assessment of CDM projects on the ground in India, detailed earlier in this report.

a) Overarching Recommendations:

1. Revamping the Institutional framework of CDM both globally and from a domestic perspective.

The current institutional framework of the CDM has a number of flaws that needs to be addressed. Some of these include:

a) Complex and lengthy procedures results in the mechanism capturing only projects that are large enough to ensure that there are sufficient reductions in emissions in order to cover the huge costs of accessing the carbon markets through the CDM route. Even the bundling of projects approach, resulted in small scale projects that could potentially benefit the common man being excluded from approached the CDM markets

b) The complex and lengthy procedures also have led to very few countries having the capacities and capabilities to access the market through the CDM route and therefore, as can be seen from the CDM trends, it has been the fast developing economies which have cornered bulk of the CDM projects, with least developed economies virtually being left out of the race.

c) The other concern with the current institutional and framing of the CDM is with regard to its contribution to “Sustainable Development” and equitable distribution to

economic, social and environmental benefits. While this issue, has been contested time and again, there are enough studies that indicate that smaller scale projects tend to deliver a higher number of sustainable development benefits with higher socio-economic benefits to communities, rather than large scale projects or even a large number of bundled small scale projects.

Therefore, it is important that a revamped institutional framework of CDM incorporates the principle of promoting sustainable development to ensure equitable distribution of economic, social and environmental benefits to communities. Further, revamping the process of CDM to make it simpler will also ensure that more countries can access the carbon markets and at a community level, make it simpler for communities to access the markets, rather than follow the large corporate route.

Other institutional revamping measure would include:

a) Promote a robust funding strategy to enable the CDM have its own funding and project implementation capacity. This would reduce the complex processes of validation of projects and thereby keep the costs of accessing the CDM low.

b) Emphasis on sectoral baselines, with stress on projects that are truly in the basket of sustainable development projects and not merely "relatively low carbon projects".

c) A monitoring unit that proactively monitors projects from delivering the sustainable development objectives

d) Ensure a participatory, bottom-up approach, creating the necessary environment that fosters interaction between and amongst a wide range of stakeholders

e) Integrate the CDM structure within the wider international post 2020 climate governance regime

A package that would encompass the above with an effective implementation mechanism would ensure that the CDM could truly ensure that countries are put on a pathway to sustainable and inclusive growth and development, with every country having the capacity to access the markets and importantly from a governance perspective, ensure wider participation of stakeholder groups and address the participatory gaps of civil society and community groups in tackling climate change.

b) Defining Sustainability:

The current CDM framework has left the definition of "sustainable development" to be determined by National Designated Authorities. However, it is important to have a global definition of "sustainable development" and in line with the discussions taking place at the UN for a post 2015 sustainable development framework.

Some of the key criteria for identifying sustainable development indicators for CDM projects would be the following:

- Should provide relevant and robust measures of progress towards the targets of the Sustainable Development Goals;
- Should be clear and straightforward to interpret and provide a basis for international comparison;
- Should be broadly consistent with systems-based information, such as systems of national accounts and systems of environmental-economic accounting to ensure coherence of the indicators;

  Should be based to the greatest extent possible on international standards, recommendations, and best practices. While currently there are broadly agreed principles for sustainable development, there are clearly no legally binding targets for sustainable development. However, there are various international treaties, which have aspirational targets, such as the aichi target for bio-diversity conservation under the convention on biological diversity, the conservation of wetlands under the Ramsaw convention and so on.. Therefore, any national plans on sustainable development should factor in some of the targets already conceived under various international conventions.
- Should be constructed from well-established data sources drawing on public and private data, be quantifiable, and be consistent to enable measurement over time; From an Indian perspective, there is contradictory or conflicting jurisdiction over natural resources management between states and the central government. Further, there is little or no devolution of legal powers to communities for conservation of natural resources or providing them with incentives to conserve. In addition to the above, there is a general apathy towards conservation of natural resources as whole and is seen as coming in the way of development. Therefore, even though, dedicated agencies and organisations in India compile data on various aspects conservation of natural resources, there is very little political will to act on the information that is available. In view of this, the Government needs to devise ways that can bring together all the information with clear targets for sustainable use of natural resources.
- Should have a designated lead international organization or organizations to be responsible for timely, high-quality national reporting of the indicator with due consideration to cost effectiveness and lean reporting processes
- Last, but not the least, should be flexible enough for country level adaptation, particularly factoring in in-country circumstances. However, having said this, and as indicated above, any in country adaptation cannot deviate from international standards agreed or is in conflict to some of the aspirational targets agreed under various international conventions.

While there are a number of definitions to “Sustainable Development’, the most often used, is the one from the World Commission on Environment and Development, presented in 1987, where Sustainable development is defined as “Development that meets the needs

of the present without compromising the ability of future generations to meet their own needs."

Translating this into action, a sustainable development pathway is one, which promotes, social, environmental and economic progress within limits of the natural resources of the earth or within the planetary boundaries.

2. Translating the above in the in-country Domestic Context:

At the broad and national level, the following reforms need to be carried out on a war footing.

1. The Host countries need to set up effective institutional mechanisms for the approval of CDM projects as well as to assess the contribution of these projects to national priorities for sustainable development
2. Since the MoEF is the national designated authority for the CDM in India, it should emphasize and prioritize on greater clarity of the sustainable development benefits of a CDM project activity.
3. A universal checklist of sustainable development benefits must be developed, with an in-built flexible mechanism for the countries to add or ignore conditions based on local priorities, thereby making the system more standardized. The lack of a definition of sustainable development makes the requirement for CDM projects to contribute to sustainable development in the host country meaningless.
4. Establishment of an effective international process at the CDM executive board level, for ex-ante and ex-post, monitoring of the sustainable development criteria.
5. Certain baselines must be set for granting approval to only those project activities that have a positive impact on sustainable development.

Some of the key factors that would ensure sustainable development and lower the carbon foot print and from a CDM perspective are:

a) Energy Consumption

b) Transportation and sustainable habitat

From an energy consumption and transportation, the key indicator for measuring sustainable development is :

a) Optimization of the renewable energy and energy efficiency potentials

b) Increased focus on small scale renewable energy projects aiming at 100% energy access for all households in India

c) A plan to Phase out of fossil fuels to the extent possible over a long term period

d) Increased focus on mass public transport systems and promote non-motorised transport – such as dedicated walk ways and cycle pathways and in hilly regions, ropeways.

e) A policy framework that ensures mandatory compliance of a progressive targets for emissions reduction in transportation – city, state and national targets.

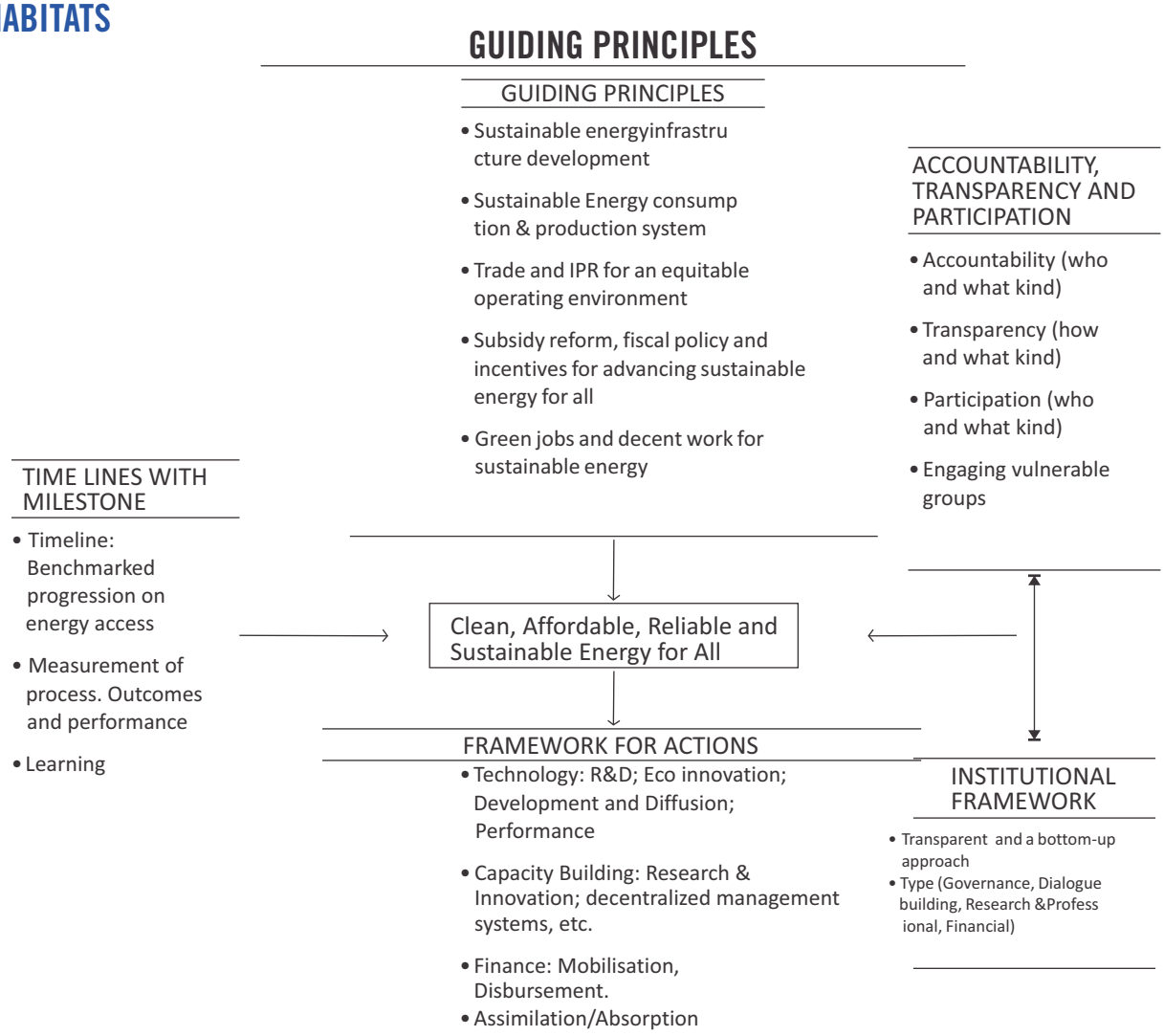
f) A framework that defines sustainable levels of transport energy use and reducing transport greenhouse gas emissions with milestones and targets.

g) A framework for reducing pollutant emissions from transport to levels that minimize effects on human health and/ or the environment, with timelines and milestones.

h) Mandatory Green Building Norms in line with international accepted standards such as LEED standards. The starting point could be the "Energy Conservation Building Code" of India, with progressive targets.

The following flow chart gives a depiction of a possible framework for sustainable energy and promotion of sustainable habitats.

FIGURE 10: FRAMEWORK FOR PROMOTION OF SUSTAINABLE ENERGY AND SUSTAINABLE HABITATS



From a local context and from a process issue, some of the issues of concerns that need to be addressed or set in motion are

a) A comprehensive policy for awarding CDM projects needs to ensure that the process is transparent with participation, particularly of stakeholders from local communities in a fair manner. Specifically, the consultation process needs to be well defined, with the scope of the consultation made known to all participating stakeholders, ensure that the process is participatory with advance notice given to all stakeholders and community groups in local language, explicitly stating the purpose of the consultation and ensuring that the voices of communities are recorded.

b) One critical issue that needs to be explicit in any comprehensive policy is to ensure that land and equity rights of communities are not compromised. Effort should be made to evolve various strategies to ensure that community also get to participate in the project, perhaps as share holders, or perhaps in the form of land being made available for the project on a lease basis, for which communities earn a regular income, or perhaps sharing of profits, or a combination of all of these, as long as community rights are not compromised.

c) Make easy the CDM process to ensure the promotion of social entrepreneurs, particularly in the field of energy access solutions. Importance to be given to small scale renewable energy generation

d) Made easy CDM process to ensure the promotion of energy efficiency at household level, particularly aimed at large residential complexes and gated communities, which is a growing trend in India.

e) Ensure that every CDM project incorporates training and capacity building of community members. Very often, there is a huge talent available at the local level, but requires some amount of training to fine tune the skills. Instead of employment benefits be given to people from outside the project locations, effort needs to be made to employ local folks and only if these options are exhausted, can the company look outside the region for employment.

f) Last but not the least made the CDM process transparent.

6. Conclusion

Although falling carbon prices and new restrictions imposed on the purchase of CERs post 2012, have slowed down the CDM's growth; it continues to contribute to the UNFCCC's objective of mitigation. Based on the sample evaluated for this study, it remains uncertain as to the extent these projects contribute towards India's sustainable development. While the diverse range of CDM projects in India do offer an opportunity for promoting sustainable development, it appears to have grossly failed in serving as catalyst for development. What is also clear is that they cannot be evaluated at the same level. For example, it would be

inappropriate to expect a solar plant to generate large-scale employment since its PDD lists employment as a benefit resulting from the project activity.

There are issues in India that are endemic to the system (such as gender based wages in some states) and it is unfair to expect their correction through the CDM. The PDDs have a tendency to include sustainable development benefits as a means of fulfilling the Executive Board's conditions, and their inability to highlight the scale of the benefits (in the form of number of people employed or duration of employment) results in a difficult evaluation.

Although the exact measurement of sustainable development impacts is not feasible, the delivery of sustainable development benefits should not be compromised. These benefits must be ensured through the mechanism by putting in place a monitoring and evaluation mechanism for project developers to follow. The concept of sustainable development is fairly broad, and the inconsistencies in the delivery of sustainable development benefits can be eliminated by streamlining the CDM and making it more than just a carbon financing mechanism.

7. Annexure

Phase 1

States Covered: Maharashtra and Gujarat

1. Project Name - Priyadarshini - Pertinent Wind Power Project in Maharashtra

Location - District: Satara, State: Maharashtra

UNFCCC Registration number - 9508

Project Description: The CDM project titled "Priyadarshini - Pertinent Wind Power Project in Maharashtra" is a grid connected wind generation project. The wind farm is located around the villages of Garlewadi and Kaledhone of Khatav Taluk, Satara District, of Maharashtra. It is operated by Regen Powertech Private Limited; a Chennai based Wind Turbine Manufacturer. The project activity involves the generation of clean electricity from wind energy and supplying the energy to the NEWNE grid of India. The project activity is a bundled project activity and involves the installation of two wind turbine generators of 1.5 MW capacity each. The total capacity of the project activity is 3MW. In absence of the project activity the electricity supplied to the grid would have been generated by the grid connected power plants and by the addition of new generation sources into the grid. The project activity will supply clean electricity to the grid and thereby replace the energy generated by a fossil fuel fired power plant, resulting in low Carbon dioxide emissions. The Project activity is expected to supply 5020 MWh of electricity annually thereby reducing GHG emissions is 4783 tonnes of CO2 equivalent for a crediting period of 7 years.

Sustainable Development benefits as outlined by the PDD

SOCIAL WELL BEING	ECONOMIC WELL BEING	ENVIRONMENTAL WELL BEING	TECHNOLOGICAL WELL BEING
• Development of infrastructure like road network, school, temple, street lighting. • Generation of local employment • Alleviate poverty by generating additional employment • Improving local economy	• Employment opportunities • Reduce rate of migration to urban area • Market facilities for local products • Improvement of a rural economy • Project will lead to attract additional investment/opportunities in the local region	• Power generation from wind power is one of the cleanest modes of power generation • Project activity does not involve release of pollutants in air, water or soil • Conservation of conventional fuels	• Environmentally safe and sound technologies • Technology is comparable to best practices in order to assist in upgrading the technological base in the local region

Our Independent Assessment

The company claimed to provide employment opportunities to the villagers, however it was recorded that there was no direct or indirect employment generation within the wind farm premises, or enhancement in terms of livelihood options for the community members. The company preferred technically skilled laborers, which seem to lack in the area, as a result of which people from elsewhere were included in the workforce. The overall access to road infrastructure was observed to be very poor, with the exception of the access roads to the wind farms which were relatively in better conditions. There seems to have been no other benefits provided by the company to communities, either in terms of developing the school, or providing medical facilities or for the matter ensuring improvement of infrastructure such as roads etc. The market access and mobility was also observed to be very poor, and bulk of the agricultural produce was mainly being used for self-consumption. Within the wind farm premises, direct access to the local grocery shops from time to time for essential supplies exists, but the bulk of the main supplies come from elsewhere. On overall environment and pollution levels, no complaints were recorded by the villagers.

Agriculture and animal husbandry are the main livelihood options for the villagers. However, due to low agricultural productivity villagers are forced to sell their land and migrate to nearby towns/cities in search of employment. The lump sum paid for the sale of land to the company has exhausted with no other major source of income or revenue stream left for the villagers, thus degrading the rural economy and overall well-being of the villagers.

2. Project Name - Pandurang SSK RE Project

Location - District: Solapur, State: Maharashtra

UNFCCC Registration number - 0313

Project Description: The CDM project titled "Pandurang SSK RE Project" utilizes bagasse for the generation of electricity. The project is located at the Shree Pandurang Sahakari Sakhar Karkhana Ltd co-operative sugar factory in Maharashtra. Sugar factories, employ co-generation for their own internal steam and power requirements from the combustion of bagasse, a fibrous material resulting from the milling of sugar cane. The high efficiency of combustion of bagasse will lead to a higher generation capacity and permit the power plant to generate surplus electricity. The project activity is expected to provide about 9 MW of electrical power to the Maharashtra grid. In absence of the project activity the additional regional energy required would have been supplied by the thermal power plants. The project activity increases the power generation capacity of the plant, this surplus electricity can be exported to regional grids and. this will therefore supplement current and planned electricity generation from traditional fossil fuel based power plants. The Sugar Mill is located in and around the villages of Mire and Shreepur of Malshiras Taluk, Solapur District, of Maharashtra is primarily operated by Shree Pandurang Sahakari Sakhar Karkhana Ltd co-operative sugar factory in Maharashtra. The project produces renewable energy from the combustion of bagasse and other biomass. The project falls within the small scale rating as the total generation capacity of the new unit is 9MW, i.e. below the 15MW.The project activity ,over the crediting period of ten years will help in the annual average estimated emission reductions of 42,446 (tonnes of CO2e).

Sustainable Development benefits as outlined by the PDD

PROJECT NAME	SOCIAL WELL BEING	ECONOMIC WELL BEING	ENVIRONMENTAL WELL BEING	TECHNOLOGICAL WELL BEING
Pandurang SSK RE Project	The factory is directly involved in providing educational and health facilities to its workers.	Employment of 25 people and the returns from the project will accrue to the members of the co-operative.	• Conservation of natural resources like fossil fuel. •GHG emission reduction and reduction in emissions of other harmful gases (NOx and SOx) that arise from the combustion of coal.	The factory is directly involved in providing educational and health facilities to its workers.

Our Independent Assessment

As per the claims made, schools offering teaching facilities from 1st to 5th Standard were established for the educational benefit by the company for the children of the laborers involved in helping the farmers during the crushing season for harvesting the sugarcane yield. Besides this, Shripur already has a school established till 12th standard, where children of the hamlet study. In terms of Medical facilities Shripur has its own Primary Health Centre run by a doctor in the hamlet. In spite of the factory ensuring in provision of medical facility to its workers by setting up a health centre, which would be run by 4 doctors at a reduced cost, there were conflicting views on the availability of the mill medical services to the people of the nearby villages. A local employee of the mill from Shripur claimed that the villagers are permitted to use the medical facilities provided by the company whereas people from village Mire denied this as they were not even allowed to enter the company premises.

Regarding the employment opportunities conflicting views were obtained from a Shripur Sugar Mill employee and local villagers. While the former claimed that the villager's livelihood is fulfilled in direct or indirect ways because of the Sugarcane mill. The bagasse generated out of it is used as a fuel to generate electricity in their subsequent process & farmers are paid Rs. 2300/ ton of the sugarcane. But Mire villagers were dissatisfied with the direct employment opportunities provided by the company, they said that the mill has hired people from other villages due to political reasons and only 2 people have got direct employment from their village because of undue pressure from the villagers. The villagers indirectly sell their sugarcane to the mill at the price of Rs. 2300/ton of sugarcane. On an average 60% of the sugarcane produce from their village go to Pandurang mill.

The environmental impacts due to the project activity did raise certain health issues. The Sugarmill is situated in Shripur and mire villages near to river Bheema and had been discharging its effluent in to the river. The Mire villagers complained that during the mill operational period of 6 months/ year, the company discharges effluent into the river which gives the water a foul odor and makes it unfit for drinking purpose. Also cattle are affected as they do not use that water. In addition to this the contaminated water had health impacts as it provided a breeding ground for mosquitos and caused skin diseases amongst many villagers. The sugar mills have been a major reason for the water contamination in the area.

3. Project Name - 15 MW grid connected wind electricity generation project by Aryan Coal Benefications Pvt Ltd., New Delhi

Location – District: Sangli, State: Maharashtra

UNFCCC Registration number – 0313

Project Description: The project for CDM is titled, "15 MW grid connected wind electricity generation project by Aryan Coal Benefications Pvt Ltd., New Delhi", the CDM project is a bundled 15 MW of 1.25 MW each of electricity generation by an investor, namely Aryan Coal Benefications Pvt Ltd. The wind farm located in and around the villages of Pachegaon and Ghatnandre of Kavathe Mahankal Taluk, Sangli District, of Maharashtra is primarily operated by Suzlon Energy Ltd., a Pune based Wind Turbine Manufacturer. So far, the companies have not claimed or sold their emission reduction certificates, and the registration period is not mentioned on UNFCCC website but it has mentioned that the generation of electricity started from the year 2011.

Sustainable Development benefits as outlined by the PDD

PROJECT NAME	SOCIAL WELL BEING	ECONOMIC WELL BEING	ENVIRONMENTAL WELL BEING	TECHNOLOGICAL WELL BEING
"15 MW grid connected wind electricity generation project by Aryan Coal Benefications Pvt Ltd." at Village: Ghatnandra, Taluka: Kavathe Mahankal, District Sangli, Maharashtra	• Direct and indirect employment benefits accruing out of ancillary units for manufacturing towers for erecting the WTGs and for maintenance during operation of the project activity. • Infrastructure improvement as development of road network. • Improvement of the quality of electricity in terms of its availability and frequency as the generated electricity is fed into a deficit grid.	• Improving the grid frequency and availability of electricity to the local consumers (villagers & sub-urban habitants) • Generation of local employment • Diversification of the national energy supply	• Resource sustainability • Bio-diversity friendliness • Reduction of levels of pollution	• Environm entally safe and sound technologies • Priority to the renewable sector or energy efficiency projects in order to assist in up-gradation of technological base.

Our Independent Assessment

The claims of employment opportunities to the villagers is contradictory, as most of the villagers have not been directly or indirectly been employed by the company. The reason for this is the lack of skilled laborers in the village; this can be cited as one of the major reasons for their unemployment. The overall road infrastructure has been pretty decent, but the village

roads would require drastic improvements. The company had also given Rs. 10 lakhs to the villagers to build a temple, and the villagers complained that the company had promised a further amount of Rs. 10 lakhs which has not come so far. The company has provided the villagers with medical facilities and has opened their facilities for them to use.

4. Project Name - Sintex 7.5 MW Natural gas based package cogeneration project, Gujarat – India

Location – District: Gandhinagar, State: Gujarat

UNFCCC Registration number – 2471

Project Description: The CDM project titled "Sintex 7.5 MW Natural gas based package cogeneration project, Gujarat – India " is a 7.5 MW capacity cogeneration plant situated in and around the villages of Saij and Arshodia of Kalol Taluk, Gandhinagar District, of Gujarat. It is primarily operated by Sintex Industries Limited known for plastic and textile production. The CDM project utilizes the natural gas for electricity generation by installation of a gas based package cogeneration unit specifically 7.5 MW natural gas based turbo alternator with an effective exhaust waste heat recovery module. In absence of the project activity the company would meet its total electricity demand of 13 MW partially by combustion of fossil fuel and partially from the grid electricity supply. The project activity will generate 7 MW of electricity which was earlier derived from the grid, thus replacing the fuel oil which they used to generate another 6 MW of electricity. Thus, the electricity generated is for self-consumption. The project activity is being considered for fixed crediting period of ten years. The project activity is expected to reduce an average of 25122 metric tonnes CO2 equivalent per annum. The project activity will help in reducing greenhouse gas emission leading to a cleaner environment by reducing SOx, NOx and particulate matter emission. The project activity will also lower the fossil fuel consumption and thus will lead towards fossil fuel conservation and also aid in achieving national energy security.

Sustainable Development benefits as outlined by the PDD

PROJECT NAME	SOCIAL WELL BEING	ECONOMIC WELL BEING	ENVIRONMENTAL WELL BEING	TECHNOLOGICAL WELL BEING
Sintex 7.5 MW Natural gas based package cogeneration project, Gujarat – India	• Generation of employment opportunities for professional, skilled and unskilled labor for management, operation and maintenance of the new activities.	It will help in creating a few ancillary industry opportunities in the vicinity of the project.	•GHG emission reduction •The project would result in eliminating the SOx, NOx, carbon monoxide and particulate matter emission level.	•Robust and clean

	• Contribute towards capacity building in terms of technical knowledge and managerial skills. • The project activity through partial elimination of fuel oil consumption will contribute towards the national energy security.		• Reduction in the local thermal pollution to a considerable extent. • Better management of health and safety of the employee through incorporation of equipment with minimum noise generation and utilization of, sound attenuation structure.	• Encourage the development of modern and more efficient cogeneration of electricity, thermic fluid heating and steam generation using natural gas, throughout the region.

Our Independent Assessment

The generation of employment activities, as claimed by the company has been different for both the villages. Village Sair recorded lower employment opportunities provided by the company, about 10 people from the village, the reason for absence of direct employment by the company is the lack of skilled labourers, moreover women were not employed by the company and labourers were employed at low wages compared to the people in other villages. However in the village Arshodia there was direct employment, given to about 50 villagers by the company, and villagers were being paid well by the company. There has been development of industries like IIFCO, GIDC and several villagers have been employed by these companies. The local environment has been severely affected, as the air quality has degraded in the villages due to industrial development in these areas, with villagers experiencing a rise of respiratory problems. In Arshodia the disposal of Fly Ash has impacted the agricultural productivity and has also led to water logging problems in the drainage lines of the region.

5. Project Name - Solar Power Plant of 15MW in Gujarat by Palace Solar Energy Private Limited

Location – District: Charanka, State: Gujarat

UNFCCC Registration number - 9455

Project Description: The CDM project titled "Solar Power Plant of 15MW in Gujarat by Palace Solar Energy Private Limited" is a solar power generation project. The project has been implemented at Charanka village of Patan district in Gujarat state of India. The proposed small scale project activity includes installation and operation of l 6,345,660 number of PV modules having capacity of 235 W (p) and 240 W (p). The annual estimated power generation for

proposed solar PV plant is 24,083 MWh. The electricity generated by the project activity would be sold to the NEWNE through Power Purchase Agreement (PPA) contract. The project is a green field activity, as there was no other activity at the site of the project participant prior to the implementation of this project activity. The pre-project scenario did not involved the generation of solar PV based power and supplying it to the grid, therefore, in the absence of the project activity, the equivalent amount of electricity would have been generated from the connected / new power plants in the NEWNE grid. The average annual and total emission reductions for a crediting period of 7 years due to project activity are 22,948 and 160,636 tCO2 respectively.

Sustainable Development claims in the PDD

PROJECT NAME	SOCIAL WELL BEING	ECONOMIC WELL BEING	ENVIRONMENTAL WELL BEING	TECHNOLOGICAL WELL BEING
Solar Power Plant of 15 MW in Gujarat by Palace Solar Energy Private Limited	•The proposed project activity leads to alleviation of poverty by establishing direct and indirect benefits through employment generation and improved economic activities by strengthening of local grid of the state electricity utility. •The proposed project activity leads to development of supporting infrastructure such as road network etc., in the solar park location, which also provides access to the local population.	•The proposed project activity requires temporary and permanent, skilled and semi-skilled manpower during construction and operation of proposed solar power project; this will create additional employment opportunities	•Being clean energy source also contributes to resource conservation.	•The technology is environmentally safe and sound as it does not produce greenhouse gases and any toxic or radioactive waste

Our Independent Assessment

As per the claims made the company has not provided direct or indirect employment opportunities to the villagers. There was not any direct employment during the construction phase of the project, and also in technical related activities due to the unavailability of skilled labourers in the village. Most of the land in the village has been sold by the farmers for the project activity leaving less land area for agricultural productivity. Several farmers have sold the land for the project activity under pressure from higher officials. There also has been no improvement in infrastructural facilities, with poor roads built across the village, the has been no bus services for the last 20 years.

6. Project Name - 51 MW wind power project of ONGC at Surajbari, Gujarat in India

Location – District: Kutch, State: Gujarat

UNFCCC Registration number - 2856

Project Description: The CDM project titled "51 MW wind power project of ONGC at Surajbari, Gujarat in India", is a wind power project in the state of Gujarat. The project activity involves the installation and the operation of thirty four of 1500 kW Suzlon Wind Electricity Generators (WEGs) having a collective wind power generation capacity of 51 MW. The project is located, at the villages Jakhau and Village Budiya in Taluka Abdasa in Surajbari, District Kutch in Gujarat, which is considered as one of the most wind rich states, of the country .The proposed CDM project is a grid-connected renewable source of electricity. In absence of the project activity electricity would be supplied through fossil fuel based grid electricity. The project activity is expected to displace the electricity generated using fossil fuels, with renewable source of energy, thus reducing the GHG emissions thereby generating a cleaner and sustainable form of electricity. The estimated annual average amount of emission reduction due to the wind power project for a crediting period of seven years is 85762 tCO2e per annum.

Sustainable Development benefits as outlined in the PDD

PROJECT NAME	SOCIAL WELL BEING	ECONOMIC WELL BEING	ENVIRONMENTAL WELL BEING	TECHNOLOGICAL WELL BEING
51 MW wind power project of ONGC at Surajbari, Gujarat in India	•Alleviation of poverty by generating employment opportunities for the local people of the area •Contribution to the provision of	•Development of additional sectors like infrastructure development •Generation of new jobs and avenues of employment for the locals.	•The project will not generate any air pollution, water pollution or solid waste to the environment.	•The project will not generate any air pollution, water pollution or solid waste to the environment.

	basic amenities to the people leading to improvement in the quality of life.			

Our Independent Assessment

The company claims that it will bring a total change in the living standard of the village by provision of employment opportunities, health facilities, infrastructure development etc. However the situation is different on site. Only 25 villagers of the Sindhali village had provided employment opportunities, besides this the villagers were not benefitted with any direct or indirect employment opportunities. The reason for non involvement can be due to lack of technically skilled labour in the village. The access to rural infrastructure like the roads is poor, though the access roads to the wind farms are in relatively better conditions. There are no medical facilities available in village Budhiya; villagers rely on the medical facilities of village Naliya. Village Jakhau has better educational facilities and medical facility. In terms of energy access one hand Village Budiya and Sindholi have 24 hours electricity supply, the village Jakhau do face regular power outages, which ranges from 9-10 hours daily. Villagers at Jakhau are concerned that the windmill creates noise pollution otherwise there are no impact on environmental quality as such.

Phase II

States Covered: Jharkhand, Assam and Arunachal Pradesh

1. Project Name - Biomass based cogeneration project at Bhagwati Vintrade, Ramgarh, and Jharkhand, India

Location – District: Ramgarh, State: Jharkhand

UNFCCC Registration number - 7444

Project Description: The CDM project titled "Biomass based cogeneration project at Bhagwati Vintrade, Ramgarh, Jharkhand, India" is a biomass based cogeneration project located at located at Village Bongabar, Sandi, P.O. Bharechnagar, District Ramgarh, State Jharkhand, and India. . The project activity involves installation of a new renewable biomass (rice husk) based cogeneration unit, set to supply to the demand of the rice plant of Bhagwati Vintrade Private Limited BVPL. The plant is expected to generate about 95,040 tonnes of steam and 9.504 GWh electricity per annum. In absence of the project activity the equivalent amount of power and steam would have been generated from more carbon intensive sources such as burning of fossil fuels. The project activity reduces 31,646 tCO2e/ annum greenhouse gas emissions (GHG) over a crediting period of ten years.

PROJECT NAME	SOCIAL WELL BEING	ECONOMIC WELL BEING	ENVIRONMENTAL WELL BEING	TECHNOLOGICAL WELL BEING
Biomass based cogeneration project at Bhagwati Vintrade, Ramgarh, Jharkhand, India	•It will create employment opportunities for the local people during the construction, operation and maintenancephases and also through transportation of biomass material to the project plant.	•The project activity will help to bridge the gap of electricity demand and supply at local as well as national level •Employment generation for the local population which results in economic well-being. •The project activity will help in conservation of fast depleting natural resources like fossil fuels	•As renewable biomass is considered to be GHG neutral fuel, combustion of biomass in this project activity does not result in net increase of GHG emissions. •Besides the GHG emission reduction, the project activity also reduces emission of SOx, NOx, etc. associated with the combustion of fossil fuels.	•The success of the project will help in diffusion of knowledge about renewable energy technology to the other power producers and will also promote the generation of green power in the region. •Dissemination of this project will improve technological scenario and thus contribute to technological growth related to the use of biomass for cogeneration in the state of Jharkhand.

Our Independent Assessment

The company claims, provision of employment opportunities to25% of the villagers of Bongabar, however only 5-6 % are on payroll. There has been complains of hiring labourers from the other areas in spite of the villagers being unemployed in Bongabar. The main reason for this is the gap between the demand and availability of skilled labour in Bongabar. Issues have also risen on the price at which the paddy is sold by the farmers to the company, the minimum support price stated is Rs. 1250/ quintal of paddy, but farmers are forced to sell paddy at lower prices of about Rs. 600-900/ quintal of paddy. Another major concern has been the disposal of the burnt rice husk which is obtained as the waste product of the cogeneration plant, which has degraded the agricultural productivity as well as depleted the ground water availability in the area.

2. Project Name - Usha Martin Limited - Waste Heat Recovery Based Captive Power Project activity

Location – Village: Dudgha and Rapcha, State: Jharkhand

UNFCCC Registration number - 0696

Project Description : The CDM project titled , "Usha Martin Limited - Waste Heat Recovery Based Captive Power Project activity" is a waste heat recovery based captive power project which recovers the heat energy of the waste gas of the Direct Reduction Iron (DRI) kiln to produce electricity for in house consumption. The purpose of the project activity was mainly to the meet the partial power requirement of Usha Martin Limited (UML) plant from the year 2004-2005 onward, increase energy efficiency, encourage sustainable growth and reduce GHG emissions.

In absence of the project activity, a large amount of waste gases would have been exhausted from the DRI kiln. The sensible heat (about 1000 degree Celsius) of the waste gases would have gone un-utilized. The project activity has thus utilized the waste gases of the DRI kiln as heat source to operate a modern waste heat recovery (WHR) based captive power plant (CPP). The project activity is located around the villages Dugdha and Rapcha and is primarily operated by Usha Martin Limited, an iron and steel plant in Jharkhand. The estimated annual average amount of emission reduction due to the Waste heat recovery project for a crediting period of ten years is 54340 tCO2e per annum.

Sustainable Development benefit claims in the PDD

PROJECT NAME	SOCIAL WELL BEING	ECONOMIC WELL BEING	ENVIRONMENTAL WELL BEING	TECHNOLOGICAL WELL BEING
10 MW Waste Heat Recovery Based captive Power Plant at Usha Martin Limited, Jamshedpur, Jharkhand, India	Contributing to a small increase in the local employment in the area of skilled jobs for operation and maintenance of the equipment		Reducing heat energy release to the atmosphere and recovery of waste heat to generate steam. Conserving coal Reducing GHG. Reducing liquid effluents that would have been generated from the Venturi Scrubber Plant Local Pollution Abatement	

Our Independent Assessment

The company's claims to contribute to the social well being by generation of local employment has been partially fulfilled as earlier a large number of local villagers of Gamharia block right since its establishment were given employment, now the company has ceased to hire villagers due to the lack of skills and has been hiring through contractors instead for the company's various operational and management activities. The sponge iron plant creates a large amount of pollution in the region by emitting dust in the atmosphere which has posed as a reason for concern for the villagers on the impact of such emissions on their health as they are facing

respiratory problems along with some cases having impact on their kidney and liver

The availability of water for irrigation and drinking purposes has reduced over the years. Usha Martin has a number of bore wells to meet their water requirements and this has lowered the level of ground water. Also the wastewater generated by the company is discharged into Seetaram dam which is a source of drinking water for the nearby villages. Thus the project has severely affected the local environment of the project location.

3. Project Name - 2.59 MW CESIPL Renewable Power Generation Project, Sonitpur, Assam, India

Location – District: Sonitpur , State : Assam

Project Description : The CDM project titled," 2.59 MW CESIPL Renewable Power Generation Project, Sonitpur, Assam, India", is a biogas power plant project located in and around the villages Goraimari and Milanpur of Chariduar, Sonitpur District, of Assam and is primarily operated by Cleanopolis Energy System India Pvt. Ltd. The project activity utilizes various organic streams cattle manure (120 TPD),agro waste (160 TPD)and food waste from vegetable market (80 TPD)—to generate biogas, which is in turn used to generate power which will be exported to the regional grid namely the Assam Power Distribution Company Limited (APDCL). The project comprises of 6 digesters an slurry tanks, each having a capacity of 3000 cu.m. The total power generated by the project is around 2.59 MW. The project activity reduces 41,610 tCO2e/ annum greenhouse gas emissions (GHG) over a crediting period of ten years.

Sustainable Development Benefits claimed in the PDD

PROJECT NAME	SOCIAL WELL BEING	ECONOMIC WELL BEING	ENVIRONMENTAL WELL BEING	TECHNOLOGICAL WELL BEING
2.59 MW CESIPL Renewable Power Generation Project, Sonitpur, Assam, India	• Cleanopolis Energy Systems India Private Limited (CESIPL) has devised various approaches (payment and barter) to source the agricultural waste from farmers. .	•The project will generate a revenue stream for the farmers who will supply the cattle and green waste to the project developer. •The organic fertilizer in turn will reduce the dependence on the purchase of synthetic fertilizers.	•The project activity helps reduce CO_2 emissions by the generation of power from biogas which is a safe and clean fuel. •In addition it also reduces the CH_4 emissions that would have occurred from the green waste and cattle dung lying unattended.	•Anaerobic digestion for power generation has not yet been as common as other renewable energy technologies employed in the country. The project will thus provide a boost to the technology innovation.

	•This also addresses the health hazards and foul odour caused in the village due to piles of unattended waste.	. •Thus the waste that was other wise unutilized will now serve as a revenue stream to the local people in the region.	•The project will have a positive impact on the air, water and soil qualities in the region. •The by-product from the process will be used as an organic fertilizer.	

Our Independent Assessment

During the field visit, it was observed that the project had not started and as per Company representatives' claims the project was expected to start in October 2013. This limits our focus of study which is to analyze the project from the lens of Sustainable Development that the project has brought about as claimed in the PDD. The company claims to source the agricultural waste from the farmers of the area and compensate them through barter system by allowing the farmers to use the residue generated after the project activity which will serve as an organic fertilizer on the fields. The organic fertilizer will also replace synthetic fertilizers and therefore improve the soil quality and reduce the harmful impact of synthetic fertilizer. In this way the company has estimated that through this activity around 5000 households will be supplied organic fertilizer in return of the biomass sold to the company.. However other than this, the company representative claimed that there will be no other direct compensation to the villager.

However, there persists a problem with the availability of agricultural waste in the area. The agricultural productivity is low due to man – elephant conflict in this region. Therefore , it raises a question on the adequate availability of the biomass for the energy generation. Although local people are aware of the biomass power project undertaken in their area, they were claims of stakeholder meeting not being held in their area , so the villagers, are therefore still unaware of the project motive and the trading terms of the biomass with the company.

4. Project Name - Desang Hydro Power Project at Assam, India and Demwe Lower Hydro Electric Project, Arunachal Pradesh, India

Location - State :Assam and District : Lohit, State: Arunachal Pradesh

Project Description : The CDM project titled , " Desang Hydro Power Project at Assam, India" , is a a run of the river project which involves generation of electricity by utilization of hydel energy from river Dilli or Desang . The project activity is promoted by Desang Hydel Power

Company LLP. The electricity generated through the project activity will be exported to Namrup Thermal Power Plant switchyard, and evacuated to the NEWNE Grid of India . In absence of the project activity electricity to the grid would have been supplied from energy generated by the fossil fuel powered plants. The project activity will involve the generation of electricity from renewable energy sources and consequently will reduce the greenhouse gas (GHG) emissions into the atmosphere through prevention of power generation by the fossil fuel. Two turbines of capacity 4.5 MW will be installed; hence the total installed capacity of the project activity is 9MW. The gross generation of the project activity will be 45,727 MWh annually. The estimated annual average amount of emission reduction due to the Hydropower project for a crediting period of ten years is 39450 tCO2e per annum.

The CDM project titled , "Demwe Lower Hydro Electric Project, Arunachal Pradesh, India", is a run of the river project is located on the Lohit River in the elevation stretch of EL+ 426.80 m to EL + 300 m, in Lohit District, Arunachal Pradesh State in India. The project activity involves production of electricity using the clean and renewable Run of the River technology. In absence of the project activity electricity to the grid would have been supplied from energy generated by the fossil fuel powered plants. The project is a greenfield activity as it involves generation of clean and eco-friendly power feed the electricity generated to North East West & North Eastern (NEWNE Grid of India. The total installed capacity of the project will be 1750 MW. The estimated annual average amount of emission reduction due to the Hydropower project for a crediting period of ten years is 5,652,952 tCO2e per annum.

Sustainable Development benefits as outlined in the PDD

PROJECT NAME	SOCIAL WELL BEING	ECONOMIC WELL BEING	ENVIRONMENTAL WELL BEING	TECHNOLOGICAL WELL BEING
9MW Desang Hydro Power Project at Assam, India	•The project activity would lead to development of roads and local infrastructure •The project activity, during its various phases, would lead to the creation of job opportunities	The project activity would lead to the creation of business opportunities for the equipment manufacturers, suppliers, contractors and other consultants. The project will lead to improvement in power scenario in the state of Assam, thereby	•The project involves power generation from renewable source (hydro power) and avoids combustion of fossil fuel for power generation and hence does not lead to any GHG emissions in the environment..	•The project would involve use of environmentally safe and sound technology for generation of power. The technology used in project activity is well-proven and successful implementation of the project will further promote the use of it.

1750 MW Demwe Lower Hydro Electric Project, Arunachal Pradesh, India	•Improve power availability in the Project area and State, results in improvement/ development of enterprises. •Helps in development of communication and road infrastructure in the backward Project area. •Various planned outlay as per Rehabilitation and Resettlement (R & R) activities and Local Area Development Plan (LADP) will help in improvement of livelihoods and standard of living of the local villagers.	•catering to power requirements of the local people and help in improvement of their quality of life. •Create job opportunities for locals during the Project construction and operation period. •Helps in development of livelihood options for the local and improve their economic condition • Royalty in the form of free power to the state will improve the state's exchequer and its budgetary allocation to the local development	•Supply clean electricity to the grid and helps in mitigation of GHG emissions. • Helps in mitigating emissions of environmental pollutants, such as the SOX, NOX, SPM etc, in comparison with the fossil fuel based thermal power production.	•The Project activity, being an efficient and environment friendly Run-of-River hydro technology with diurnal storage will have minimal disruption to the local environment and its inhabitants.

Our Independent Assessment

During the field visit it was observed that ,the 9 MW Desang Hydro Power Project Assam is inactive , with no construction activities had started at the site whereas the 1750 MW Demwe Lower Hydro Electric Project; Arunachal Pradesh, India was registered CDM project and there were no ongoing activities. There has been several issues of concerns on the hydropower projects in the North east amongst the stakeholders. The prime reason of concern negligence of the companies for people living in both the upstream and downstream of the river basins who are economically dependent and socio-culturally attached to the river. Secondly there has been concern on the safety of the inhabitants associated with these projects. The reason is the loose soil which may lead to land slide in the region as it comes under Seismic V Zone and there have been episodes of earthquakes in 1889 and 1950. Dams are affecting the local people and the community but the people are unacquainted of the claims made by the dam developers to least impact on biodiversity and community

Phase III

States covered – Chhattisgarh, Karnataka, Rajasthan, Himachal Pradesh, and Andhra Pradesh

1. Project Name - Reforestation of degraded land in Chhattisgarh, India

Location – District: Durg, Raigarh and Rajnandgaon , State : Chhattisgarh

Project Description: The CDM project titled," Reforestation of degraded land in Chhattisgarh, India", is a reforestation project operated by Prakash Industries Limited (PIL) and their associates, across Durg, Raigarh and Rajnandgaon districts of Chhattisgarh state of India . The Reforestation site is located in and around the villages Rano, Navagaon, Hathidobh, Saleh Kala, Pendravan, Bundeli, Saleh Khurd of Durg District, Saleh Kala of Rajnandgaon District and Lara of Raigarh District of Chhattisgarh. The total area covered under the project activity for plantation is 282.2 ha. For Durg sites plantation started from August 2002 onwards and was accomplished by March whereas for the sites in Raigarh it started from March 2005 and was completed by the month of October in 2005. Gmelina arborea and Albizzia lebbeck are the principal tree species being planted in these areas. In absence of the project activity the land would have continued to exist as degraded land. The project activity helps to reclaim the degraded land in a sustainable manner and also helps to enhance the environment by increasing the carbon sink and reducing pressure on the forested land in the region . The estimated annual average amount of emission reduction due to the reforestation project for a crediting period of twenty years is 3555 tCO2e per annum.

Sustainable Development Benefits as outlined in the PDD

PROJECT NAME	SOCIAL WELL BEING	ENVIRONMENTAL WELL BEING	TECHNOLOGICAL WELL BEING
Reforestation of degraded land in Chhattisgarh, India	• Project activity will create regular round the year employment opportunities for the local people. • The project activity will benefit the local people with free of cost fuel wood and fodder. • The local will be provided training on farm machines & farming techniques for their self-employment. • Farmers will be exposed to the pioneering Agro–forestry techniques along with better watershed management, land use planning and soil-moisture conservation.	• Change in the land use pattern of the area by effective utilization of otherwise barren lands. • Pressure over the existing forest areas of the state for fuel wood and fodder shall be minimized • Reduced indoor air pollution as readily available fuel wood expected to replace cow dung as a fuel. • Ground water recharging as project activity involves better soil-moisture conservation techniques	

	• Through a survey there has been reported a Rs. 20 increase in per man day wages after the implementation of the project activity. • The number of in- village employment days has also risen from 80 to 225 in a year as reflected in PRA study cum stakeholder's consultation. • The project activity has slowed down the migration of villagers to the nearby townships due to availability of the desired work just at their doorstep. • Sponsoring teachers since 2002 and providing training will have positive impact on education.	• Positive Impact over the associated flora & fauna and conservation of Biodiversity	

Our Independent Assessment

The company claims provide socio- economic benefit by provision of year round employment opportunities. The reforestation project has increased the employment days of the villagers, with labours employed initial phases of work, on contractual basis . The employment opportunities in some villages has been limited to only seasonal cutting of branches. Though villagers are given direct employment, the hiring amongst the is not uniform , people well known to the local supervisor are preferred to other villagers. There has not been any training programs conducted by the company for imparting training to farmers on agro forestry techniques to improve the livelihood of the villagers. Also claims to benefit the villagers by providing free fuel food and fodder are false as most of it is often sold to buyers outside the village by the company.

The reforestation activity also had positive impacts on the soil quality, the soil water conservation has increase due increase in green cover , also there has been generation of fuel wood and fodder, thereby decreasing the pressure on the existing forest land. The ground water have been primarily used to meet the water requirement of the reforested land. After the plantation, soil water conservation has increased. Villagers have claimed that the level of ground water has decreased over the years but rainfall has increased in the past decade.

2. Project Name- 7 MW Hydel Based Power Unit on River Jatashankari, Chhattisgarh

Location – District : Korba , State :Chhattisgarh

UNFCCC Registration number – 5442

Project Description: The CDM project titled, "7 MW Hydel Based Power Unit on River Jatashankari, Chhattisgarh", is Run of the River located at Jatashankari River in Korba district of Chhattisgarh in India. The project activity involves utilization of hydro potential, generated by stream of the river and using the clean and renewable energy and exporting the generated power to Chhattisgarh State Power Distribution Company Limited (CSPDCL) as per Power Purchase Agreement (PPA) between two of them. The generated electricity is exported to the regional grid system, which is NEWNE regional grid. The electricity generated by the proposed activity is non-GHG source and it also reduces the proportion of electricity generated by fossil fuel powered plants in the grid leading to lesser carbon intensive grid. The project is a 7 (2×3.5 MW) MW Run-of-the-River hydro power project and expected to generate 27.89 GWh of power per year. The estimated annual average amount of emission reduction due to the reforestation project for a crediting period of seven years is 22957 tCO2e per annum.

Sustainable Development Benefit claims in the PDD

PROJECT NAME	SOCIAL WELL BEING	ENVIRONMENTAL WELL BEING	ENVIRONMENTAL WELL BEING	TECHNOLOGICAL WELL BEING
7 MW Hydel Based Power Unit on River Jatashankari, Chhatisgarh	• The project activity would increase the availability of power in the area. • With availability of more stable power, employment opportunities would be created which would partly prevent migration of rural population to urban areas. This would contribute to increase in the economic activities in the project area. • The plant site is an isolated rural area where unemployment, poverty and other economic backwardness are prevailing. The project would lead to the	• The economy of the area is dependent on agricultural activities, in particular commercial crops. So the power generated from the project can be used for irrigational and other necessities of the area. • Project proponents had invested in the region about million INR.419.10, which would not have occurred in the absence of the project activity. This is a significant investment in the region. • The power generation from the project area would stabilize the grid as	• The scheme, being a small hydroelectric project, would not alter any environmental or biological attributes of the area. • Further, the project activity would not result in degradation of any natural resources, health standards, etc. at the project area. • As the project is hydro based; it would generate clean energy, which would result in reduction of greenhouse gases on a long-term basis.	The project uses well established Horizontal Francis Turbines for power generation. The project activity is the first hydel power project in the Jatashankari river basin. The success of the project activity has catalysed more hydel power projects to come in the basin/region.

	development of the region. During civil works, a lot of construction work will take place, which generates employment for local people around the plant site.	well as quality of power in the local area. • The project activity would result in diversification of the state grid, which is dominated by fossil fuel based generating units and improve the power quality by reducing the voltage fluctuations. • The project activity generates employment in the local area at the time of construction. • It provides stable and quality power to the industry and local areas. • Hence, the project contributes to the economic sustainability around the plant site, which is promotion of decentralization of economic power.		

Our Independent Assessment

The change of the course of the river to the canal built for the hydro power plant has affected the water availability in the region. The accessibility of the villagers to river water has decreased, they are most dependent on wells to meet their water demands. Also, there has been a decrease in the agricultural productivity of the region, due to decrease in water available for irrigation. The company has however stood by the claims to provide direct employment opportunities to the villagers during the various stages of the project activity. The company has also made efforts to compensate for the felling of trees during the construction of the project and equal number of trees have been sown on the other land.

3. Project Name - Grid connected solar PV power plant in Jodhpur, Rajasthan

Location – District : Jodhpur, State : Rajasthan

UNFCCC Registration number – 6909

Project Description : The CDM project titled, "Grid connected solar PV power plant in Jodhpur, Rajasthan " , is a 5 MW Solar photovoltaic technology based power plant located in Village-Rawra, Tehsil-Phalodi of Jodhpur district in the state of Rajasthan, under Jawaharlal Nehru National Solar Mission (JNNSM) Phase-1. It is operated by the Northwest Energy Private Limited (NWEPL). The electricity generated from the project activity will be transferred to the state grid of Rajasthan which is a part of the united Northern, Eastern, Western, and North-Eastern (NEWNE) regional grid of India, and will be sold to NTPC Vidyut Vyapar Nigam Limited (NVVN) under a power purchase agreement. In absence of the project activity , the energy transferred to the NEWNE would have been generated from fossil fuel powered thermal plants. The project activity will thus, contribute towards reducing the demand-supply gap during periods of electricity shortage and growth in the share of renewable energy in the grid mix. The proposed project activity is expected to deliver an annual net electricity of 8,966 MWh to the grid and the estimated annual emission reductions are 8,542 tCO2e annually over the crediting period of 7 years.

Sustainable Development Benefit claims in the PDD

PROJECT NAME	SOCIAL WELL BEING	ENVIRONMENTAL WELL BEING	ENVIRONMENTAL WELL BEING	TECHNOLOGICAL WELL BEING
5MW Grid connected solar PV power plant in Jodhpur, Rajasthan	• The proposed project would lead to generation of business opportunities and employment in the region thereby contributing towards social upliftment through direct and indirect benefits • The project activity in its execution will lead to development of infrastructure in the region and at the same time promote business in the region through the	• The project activity leads to an investment in the region accompanied with business and employment benefits along with improvement of grid supply which otherwise would not have happened in the absence of project activity. • The clean electricity generated through solar power by the project activity would be fed into the local grid thereby	• The project activity employs solar power for generation of electricity thereby displacing fossil fuels which are being rapidly consumed to meet the growing demand of electricity in the country thus contributing towards reduction in GHG emissions. • Solar power projects generate no end products in the form of solid	• The project activity uses thin film solar photovoltaic technology for power generation thereby demonstrating the viability of solar based renewable energy generation in the region, which is fed into the nearest sub-station (part of the NEWNE Regional Grid), thus increasing energy availability under the service area of the substation. Hence

	improvement in electricity generation capacity of the grid. • This would provide a better scenario for local industries and businesses to improve their production capacities thereby contributing towards the overall economic development of the region.	improving the availability of electricity in the region	waste (ash etc.) compared to alternative modes of power generation (e.g. coal based on which the Indian grid is primarily dependent). Hence the project activity is a cleaner source of power generation and is encouraging greener practice of power generation. • The solar power project indirectly is contributing towards conservation of non –renewable resources • which are under the constant threat of depletion due to excessive and rapid growth of energy demand .The growing threat of global warming which is a key concern is also addressed due to renewable energy use thereby mitigating climate change.	the project leads to technological well being.

Our Independent Assessment

Employment opportunities were created for the local labourers at the time of constructions, all unskilled labourers were from the three adjoining villages. The local Sarpanch were approached to provide the labour force. Once the project is concluded, there have no employment of the labourers at scale, the locals were employed as guards, watchmen etc, but as skilled labourers. The local Sarpanch of Lavan has petitioned about employing semi-skilled labourers from the villages especially those who have IT qualifications. No steps have been taken thus far. There have been some positive benefits due to the skilled personnel of the projects in and around Pokhran (the nearest town) from Jaisalmer, these are at best classified as indirect benefits. The school infrastructure have been developed through provisioning of tables, chairs etc, the secondary level school was provided with two computers by the project

developers. The New CSP plant is using the same water that is being treated in the nearby area. The supply line is the same for the villages and the plant, thereby creating water scarcity in the adjoining areas during peak summer season.
The project serves to the state grid and does not cater directly to the nearby villages. It is not clearly written in the PDD whether a part of the electricity generated to be fed into the villages or not. But on the basis of as-is-where it is, the electricity generated is currently going into the grid. After the first phase of the project, the second phase of 100MW CSP has been near completion, and will commence generation from June-July, this is additional investments to the area, and this activity has provided additional activities on contractual basis for the village unskilled labourers.

The state grid is meeting the necessary mandatory renewable energy mix with the help of power from the projects. Rajasthan has already installed huge infrastructure of the solar PV projects which are feeding to the grids. Thus there is positive benefits as per emission reduction are concerned.

4. Project Name : Greenhouse Gas Emission Reductions through Thermal Solar Power Technology - Rajasthan Sun Technique Energy Pvt. Ltd

Location – District : Jaisalmer, State : Rajasthan

UNFCCC Registration number - 9293
Project Description :- The CDM project titled ," Greenhouse Gas Emission Reductions Through Thermal Solar Power Technology - Rajasthan Sun Technique Energy Pvt. Ltd" , is a 125 MW large-scale grid connected thermal solar power project, located in n Jaisalmer district, Rajasthan, India. The project is expected to be commissioned in 2013. The electricity produced from project activity will be sold under the Power Purchase Agreement (PPA), signed with NTPC Vidyut Vyapar Nigam (NVVN) Ltd . In absence of the project activity , the electricity to the NEWNE would have been generated from sub-critical coal based power generation plants. The project activity will generate the estimated annual emission reductions are 215,132 tCO2e annually over the crediting period of 10 years.

Sustainable Development Benefit claims in the PDD

PROJECT NAME	SOCIAL WELL BEING	ENVIRONMENTAL WELL BEING	ENVIRONMENTAL WELL BEING	TECHNOLOGICAL WELL BEING
125MW Greenhouse Gas Emission Reductions Through Thermal Solar Power Technology -	• Project activity would create employment opportunities during construction and operation	• Reduce energy deficit (9.34%) and peak deficit (10.4 %) prevailing in project boundary.	• Project activity has no negative environmental impact as relies on natural solar radiation for power	• Technology to be used in the project activity would be robust, State-of-the -Art, thermal solar

Rajasthan Sun Technique Energy Pvt. Ltd	stages. Such opportunities lead to higher income levels leading to removal of social disparities prevalent in the region. • As the project activity is located in rural areas of combined regional grid, project activity would help in improvement of necessary basic infrastructure, such as roads.	• Encourage investors to make similar investments in promoting renewable power generation technologies..	generation technology. • Energy generated by the project activity leads to reduced emission intensity in Combined regional grid which otherwise would have generated from fossil fuel.	power generation technology. • Project activity promotes environmentally safe and sound technology.

Our Independent Assessment

The Company has undertaken socio-economic measures due to the CSR activity and they claim these benefits under the CDM (it is clear they claim at least part of the CSR activity as CDM benefit). The plant is running for little over two years, but the company has failed to meet development of infrastructure targets for the villages. Employment Opportunities have been created for the local people during the installation of the projects as contractual labourers. Further after the completion of the projects there has been intermittent employment being provided for the de-weeding purposes

Most of the roads have been built under the PMGSY, but the portion of the road which connects to the main village road has been built by company and now it is in poor state. So this needs to improve and the company needs to invest. Also, the land is obtained by the company directly from the government; there is no tension amongst the villagers and the company on the issue of land. The project serves to the state grid and have no direct facility to the villages. However, there have been some facilities provided through smaller modules of panels to houses for the BPL categories in the villages but it has been done on a very small scale. Overall the villagers have mixed reaction for the solar plants. This is because the promises of development are very small in relation to the need and the company has its own limits to fulfill these needs.

5. Project Name: Grid connected natural gas based power plant at Kakinada, Andhra Pradesh

Location: Kakinada, Andhra Pradesh

Project Description: GMR Energy Limited (GEL) owns and operates a barge mounted 220 MW

natural gas fired power plant. The electricity generated from the project activity is exported to the southern region grid. The project activity has been registered under the Clean Development Mechanism (CDM) as it reduces GHG emissions by generating electricity from natural gas which is a less carbon intensive and relatively cleaner energy source, as compared to coal fired power generation.

The project activity is an independent power producer and no power generating equipment existed at the coastal project site before the project plant. According to the PDD, electricity would have been generated from carbon intensive coal fired power plants in the absence of the project activity. This power plant has lower emissions in comparison to coal based power generation due to use of lesser GHG intensive fuel and efficient technology for power generation.

Sustainable Development Benefits outlined in the PDD:

PROJECT NAME	SOCIAL WELL BEING	ENVIRONMENTAL WELL BEING	ENVIRONMENTAL WELL BEING	TECHNOLOGICAL WELL BEING
220MW Grid connected natural gas based power plant at Kakinada, Andhra Pradesh	• The project activity will generate temporary as well as permanent employment opportunities in the region. •Project activity will help bridge the demand-supply gap for electricity, and help improve the society's lifestyle.	• Improvement in the energy balance and enhanced availability of power for various sectors. • Local economic improvement through creation of opportunities for contractors, builders etc. during the construction phase of the plant		•Efficient and cleaner technology and use of less carbon intensive fuel for power generation.

The PDD contains a Sustainable Development Action Plan, which outlines adherence to the MoEF regulation of contributing a minimum of 2% of CER revenue for community and society development. Based on the calculations presented in the PDD, the company plans to spend Rs. 2.6 Crores for this purpose; through its CSR arm, the GMR Varalakshmi Foundation. GEL seeks to support the local community through several socio-economic, educational, and health initiatives.

The CSR activity covers three villages near the project site-

- Dummulapeta
- Yetimogga
- Paralovapalem

The initiatives are mainly focused on improving access and quality of education, and raise awareness and access to healthcare. Some of the initiatives outlined in the PDD are:-

Education

a) Balabadis- These are preschools for children aged between 3 and 5 years, which prepare children for enrollment into mainstream education. Children are also provided with meals during the day to meet their nutrition needs. These balabadis also provide an opportunity for employment generation in the area, whereby local instructors are trained for serving in these institutions. The GMRVF in the PDD proposes to reach out to 500 children outside of anganwadis, and also seeks to support the existing anganwadis for strengthening them further.

b) Supporting government schools- For improving the infrastructure and increasing the student-teacher ratio in government schools, the GMRVF supports infrastructure development and trains and appoints volunteers in schools for imparting quality education. The scheme provides employment opportunities to the youth for serving the community.

   According to the PDD, the foundation seeks to work with 25 government schools (covering approximately 1200 students) for enhancing education delivery.

Health

The GMRVF proposes to increase health awareness, and conduct medical camps for the community thereby increasing their access to medical care. Through such camps pregnant women, children, and the elderly are provided with free health check-ups and provided free medicines. Based on information provided in the PDD, the foundation seeks to operate mobile medical units for covering approximately 2000 people per month (especially to address the health needs of senior citizens).

Sanitation

The GMR Varalakshmi Foundation constructs and maintains public toilets on a 'pay and use' basis for the communities around the project site. The foundation proposes to construct and maintain 4 public toilets for the urban communities of Kakinada.

Water

According to the PDD the GMRVF proposes to start 4 UV plants for safe drinking water facilities in at least 4 villages.

Our Independent Assessment

During our field visit, we sought to corroborate the claims outlined in the PDD with the villages surrounding the project site, and also with the villagers who are the intended beneficiaries of these activities. During the site visit to the project activity, the company representatives were

unavailable. However the in-charge of the company's CSR operations gave brief information over the phone about the company's activities. He said that the activities outlined in the PDD are under various stages of implementation and the company carries out activities in the sphere of education, health, sanitation, AIDS awareness, and access to clean drinking water.
We visited the villages of Yetimogga and Dummulapeta to speak with the villagers and find out about the implementation of the company's CSR activities.

Dummulapeta-

The village of Dumulapeta is a fishing village that comes under the Kakinada urban area. The village is electrified and consists of approximately 600 households. Dummulapeta has one government school, which is supported by GMRVF. The foundation has provided the school with tables and chairs in every classroom, refurbished the infrastructure, provided power backup through an invertor system, and established a computer lab in the school with 5 computers. Similar work has also been carried out in Paralaopeta village (Paralovapalem).

The GMRVF has also held a few medical camps from time to time in the village and distributed free medicines along with conducting health checks. The last health camp was held four months ago, although there is a government health center in the Kakinada town. Besides supporting the school, no other CSR work has been carried out in the village.

The village economy is suffering due to the government's recent 2 month moratorium on fishing. Villagers have been migrating to cities in large numbers since the formation of the SEZ, because the large scale industrial activities have increased water pollution and damaged marine life, thereby affecting livelihoods. GMR's natural gas based power plant offered hope for some employment but none of the villagers were offered any employment.

Yetimogga-

Yetimogga village also a fishing village consists of four parts, with each part containing approximately 200 households. The village has a primary school and for secondary education students have to travel to the nearby Jagannathapuram. The GMR representatives had visited the village and promised to set up a park, library, and weekly medical camps for the villagers. However, besides a medical camp held four years ago nothing has transpired till date.

During the construction phase of the plant, no manual labour was hired from the village. And no workers in the plant's current workforce are from the nearby villages. The village has shortage of drinking water. Residents of the village stated that even though GMR came forward and promised to do things, other companies operating in the SEZ have not approached the villages for anything.

There has been a noticeable drop in the fish population in the area, and for sustaining their livelihood the fishermen had to travel distances as high as 100 nautical miles from the shore for fishing. Lack of employment opportunities has resulted in mass migration to cities or villagers taking up jobs as port labor at the Kakinada port nearby. The existence of the SEZ has also resulted in water pollution and the government's recent moratorium has also affected people's livelihoods.

6. Project Name: Energy Efficiency Measures at Paper Production Plant in India

UNFCCC Registration No.: 0932

Location: Rajahmundry, Andhra Pradesh

Project Description: The Andhra Pradesh Paper Mills Limited, Rajahmundry produces 300 MT of paper every day to improve the operational efficiency of the plant and to develop into a more environmentally friendly operation, the mill has been continuously taking several steps in the plant. The energy efficiency improvement initiative is one of such tools towards accomplishment of this mission

The project activity involves installing energy efficiency measures at the plant. The components involved in the activity include:

a) Installation of variable frequency drives (VFDs)

b) Replacement of existing equipment with more efficient equipment and

c) Optimization in equipment operations and control, within the industrial unit for reduction of electricity consumption.

Sustainable Development Benefits outlined in the PDD

PROJECT NAME	SOCIAL WELL BEING	ENVIRONMENTAL WELL BEING	ENVIRONMENTAL WELL BEING	TECHNOLOGICAL WELL BEING
Energy Efficiency Measures at Paper Production Plant in India	• Besides providing education and health care facilities for its employees, their families and the community at large, the group is also involved in a number of philanthropic activities.	• The energy efficiency measures directly reduce the power consumption by the facility and thereby reduce demand at the power generation end (which is enhanced by the T&D loss). The reduction in power generation		•Efficient and cleaner technology and use of less carbon intensive fuel for power generation.

		corresponds to the reduced fuel combustion, which implies reduced GHG emission, reduced emission in transportation & mining of fuel and finally reduced SPM level. • Such energy conservation measures encourage other industries in the region / sector to adopt these measures and reduce the energy consumption		

Our Independent Assessment

We conducted site visit to the plant site and met with the General Manager (Operations) to discuss the project in and the associated sustainable benefits. The highlights of the discussion are as follows-

- Energy efficiency measures increased after International Paper takeover.
- Can't divulge CDM related information because the project is in various stages of implementation. And since it is not complete they can't provide anything yet.
- Power is generated at the plant for residential and industrial consumption from a 34 MW steam turbine.
- They have a backup 12 MW turbine at the site, but that is seldom used.
- There are over 850 employees at the plant.
- Workers colony has STP and another one is being installed at the officers' colony.
- They procure about 2 MW from the grid, they have to pay for it whether they use it or not. Hence they try and balance their power consumption by utilizing it in the residential colony.
- They also have installed a 1KW solar power system (since November 2013) as a pilot and are monitoring its performance for scaling up further.
- CDM is a good mechanism for incentivizing companies to take up such measures.
- They took up EE measures as part of improving their industrial performance and the CDM just provided them an opportunity to showcase their existing efforts.
- They follow standards as defined by International Paper, the parent company.
- They have CSR activities in the area, and other areas in Andhra Pradesh as identified by their office in Hyderabad.

- Near the Rajahmundry plant, they have installed a drinking water system in a village, helped build a road for improved connectivity, and they also recruit locals from Rajahmundry and nearby areas.
- Also have a company school where they run awareness programs for children.
- Their CSR activities are voluntary in nature.
- They have internal energy audits once every two years, and they are working towards installing an energy management system at the plant.
- They have dedicated employees working towards studying the efficiency of their equipment, and also ensuring that their emissions stay low.

7. **Project Name:** 4.75 MW biomass residue based cogeneration project in East Godavari district of Andhra Pradesh by Sri Lalitha Enterprises Industries Pvt. Ltd.

Location: Peddapuram, Andhra Pradesh

Project Description: The project activity is the installation of 4.75 MW cogeneration systems in a Greenfield paddy processing and rice milling facility developed by Sri Lalitha Enterprises Industries Pvt. Ltd to generate thermal and electrical energy in East Godavari District of Andhra Pradesh. The purpose of the project activity is to utilize available biomass residue (rice husk) as a fuel in a cogeneration system to generate power and steam. The steam and power is utilized for in-house use and surplus power would be supplied to grid.

Sustainable development benefits outlined in the PDD

PROJECT NAME	SOCIAL WELL BEING	ENVIRONMENTAL WELL BEING	ENVIRONMENTAL WELL BEING	TECHNOLOGICAL WELL BEING
4.75 MW biomass residue based cogeneration project in East Godavari district of Andhra Pradesh by Sri Lalitha Enterprises Industries Pvt. Ltd.	• Creation of direct and indirect job opportunities for the local people • Marginal reduction in the consumption of fossil fuels.	• Improved economic conditions due to employment generation in the area • Creation of business opportunities for local stakeholders such as bankers, consultants, suppliers, manufacturers etc	• The generation of energy from renewable biomass would help in preventing the contamination of the water table. • The project activity will conserve fossil fuels, thereby reducing emissions.	

Our Independent Assessment

During our site visit we met the Head of Operations at the plant. During our discussion he informed us that although the project is registered with the CDM, it has not been validated yet. Therefore the project activity has not received any credits yet.

The company decided to install biomass gasifiers for power generation because of the poor

electricity supply that was affecting production. The plant is has surplus electricity and supplies electricity to the grid. There are 3 biomass plants; 1 MW, 3 MW, and 4.75 MW at the site. Last year the plant generated 33,819 MW of electricity and 7760 MW was sold to the grid (the company has an agreement with APTRANSCO). The company has a very small technical staff to operate the machinery and the rest of the workers at the plant are contractual labor, about 600 in total. The contract labor's salaries are not uniform and their incomes range from Rs. 600 per day to Rs. 1000 per day.

The company conducts CSR activities as and when required, it's most recent initiative being the renovation of a century old school in a small town nearby.

8. Project Name: Integrated treatment facility for Municipal Solid Waste at Bangalore, Karnataka, India & Biomethanation of Municipal Solid Waste (MSW) by Terra Firma Biotechnologies Ltd., Karnataka, India

Location: State: Karnataka, District: Bangalore Rural District

Project Description: The CDM project titled, "Integrated treatment facility for Municipal Solid Waste at Bangalore, Karnataka, India, is a MSW facility aimed to reduce the atmospheric methane reductions through methods like aerobic compositing, biomethanation and land filling. The treatment facility is expected to handle fresh MSW amounting to about 1400MT/day. The project activity is situated at Gundlahalli village, in Doddaballapura taluka in the Bangalore rural district of Karnataka. Around 18,000 m3 of biogas is produced by the landfill and the biomethanation facility daily.

In absence of the project activity the MSW would have been disposed off to BBMP leading to atmospheric methane emissions. The project activity involves proper utilization of the MSW through three facilities namely aerobic compositing, biomethanation and land filling. The project activity will involve the generation of electricity from renewable energy sources, (biomass) and consequently will reduce the greenhouse gas (GHG) emissions into the atmosphere through prevention of power generation by the fossil fuel. The estimated annual average amount of emission reduction due to the project activity for a crediting period of ten years is 3,165,083 tCO2e per annum.

Sustainable development benefits outlined in the PDD:

PROJECT NAME	SOCIAL WELL BEING	ENVIRONMENTAL WELL BEING	ENVIRONMENTAL WELL BEING	TECHNOLOGICAL WELL BEING
Integrated treatment facility for Municipal Solid Waste at Bangalore, Karnataka, India	• The project activity would lead to development of roads and local infrastructure. • The project activity, during its various phases, would lead to the creation of job opportunities • Provision of clean environment for the citizens of the region benefitting the local employees and the community	• The project activity would lead to the creation of business opportunities for the equipment manufacturers, suppliers, contractors and other consultants.	• The project involves energy generation from waste and avoids combustion of fossil fuel for power generation and hence does not lead to any GHG emissions in the environment.	• The project would involve use of environmentally safe and sound technology for generation of power. Thus promoting the use of clean technology.

Besides this, the project proponent had also envisaged a monitorable action plan for the region and planned on utilization of 2% of the CERs for the sustainable development activities.

The activities include the following:

- Conducting free medical camps in the nearby rural area
- Providing Medical assistance to the weaker section of the society
- Providing educational assistance by setting up schools, colleges etc
- Provision of employment to the physically handicapped
- Improvement in infrastructure such as lighting ,water supply
- Encouraging participation in social welfare schemes
- Provision of financial assistance to NGOs working for the welfare of the society

Project Description: The CDM project titled "Biomethanation of Municipal Solid Waste (MSW) by Terra Firma Biotechnologies Ltd., Karnataka, India" is Biomethanation plant which treats fresh waste comprising of biogenic organic matter through the process of anaerobic digestion followed with the production and collection of methane emissions. The integrated facility handles fresh Municipal solid wastes amounting to about 1500 MT/day. The project activity includes only electricity generation from the collected biogas. The project activity, thus avoids methane emissions by diverting organic waste from disposal at designated dumping sites/landfill, where methane emissions are caused by anaerobic processes, and by displacing electricity energy through the utilization of biogas. The estimated annual average amount of emission reduction due to the project activity for a crediting period of ten years is 66635 tCO2e per annum.

Sustainable development benefits outlined in the PDD:

PROJECT NAME	SOCIAL WELL BEING	ENVIRONMENTAL WELL BEING	ENVIRONMENTAL WELL BEING	TECHNOLOGICAL WELL BEING
Biomethanation of Municipal Solid Waste (MSW) by Terra Firma Biotechnologies Ltd., Karnataka, India	• The project contributes in improving the environmental condition in the city of Bangalore by the hygienic treatment of municipal solid waste resulting in improvement of health standard in the city. • Recyclable items will be disposed of through local contractors, •Thereby providing monetary benefits to the local people. The project activity would provide direct as well as indirect employment opportunity to the local people on permanent and temporary basis in the region. • The project would enhance the infrastructure in the vicinity, which also involves road upgrading. It is also planned to provide power generated from biogas in the project activity to nearby villages and schools free of cost in future.	• The Project activity will generate both direct and indirect employment opportunities. There would be a wider economic impact in terms of generating opportunities for other business like workshops, marketing, repair and maintenance tasks etc.	• The project concept itself addresses the environmental aspect, as this is a waste to energy plant. The project helps in avoidance of methane emissions as well as any leachate that would otherwise have generated from the current practice of waste disposal. The project activity avoids land filling of 350 MT of waste per day and thus saves the requirement of further land filling area for dumping of equivalent amount of waste • The electricity generated through utilization of biogas produced in the project helps in reducing fossil fuel intensive power generation in the region. Further by producing organic manure the project helps in replacing the use of chemical fertilizers and hence contributes to Environment and health of the general public in many ways	• Biomethanation technology is a non-polluting, environmentally benign process from the stand point of air quality and waste disposal. The effluent will be recycled back to the digester whereas residual waste will be converted to the useful by-product such as bio fertilizer • The project would be one of the first kinds in the country to put up a Biomethanation plant which uses indigenous technology and would involve many proprietary concepts for waste segregation, Biomethanation digester design, H2S scrubber and Bioreactor landfill management techniques. This project is one of the first of its kind in India, encouraging development of modern and more efficient technology for capturing and generating electricity using biomass fuel throughout the Country.

Our Independent Assessment

Since the project proponent was same (Terra Firma Biotechnologies Ltd) and the project site was similar (Gundlahalli), Dr. R. Ganesha, Chairman & Managing Director, was interviewed for both the projects. He said that there were 15 landfills on the project site and claimed that the landfills are lined thus preventing the waste from contaminating the groundwater. Additionally 1,000 MT of solid waste is received each day from Bangalore City to feed these two projects. He said that the project does not seem to have impacted the social or economic well being of surrounding communities and this needs to be verified physically. Besides this, the use of lined and covered landfills and buffer zones of vegetation and water along the boundary of the plot to avoid groundwater contamination and air pollution needs to be verified physically. On asked upon the CDM aspect of the project and viability of CERs, TFBL, he claims has already lost Rs, 40 lakhs over CERs generated. Permission was not granted to visit the project site at Gundlahalli.

It was found that a meeting of stakeholders was held before the beginning of the project. Stakeholders were told at that time that the project would be involved in vermi-composting and therefore the habitants of Gundlahalli had no objection. When the project began, only vermi-composting activities were being carried out there. The dumping of municipal solid waste began at a later stage. However, the waste after segregation of non-degradable items is still vermi-composted and the compost is packed and sold in the open market. The employment rate in the village is poor with only 2 people being employed by the company. It was found that children attend school/college as far away as Doddaballapur town and employable persons seek work in Bangalore. The village has a majority of persons over 40 yrs. They are all involved in agricultural activities

There is absence of medical clinic in Gundlahalli. The odor from the waste dumps can be smelled at Gundlahalli at all times but especially in the evenings when the wind from the project area blows over Gundlahalli. After the beginning of the project people of Gundlahalli were afflicted with ailments like allergies, skin eruptions and inflamed throats. On testing the water samples from these bore wells and getting them tested for portability it was declared that the water was unfit for human and animal consumption. Women met have reported that there are no Self Help Groups in Gundlahalli and surrounding villages.

9. Project Name: 3MW Grid Connected Solar Power Project at Yelasandra Village, Kolar District, Karnataka, India

Location: State: Karnataka, District: Kolar District

Project Description: The CDM project titled, "3MWp Grid Connected Solar Power Project at Yalesandra Village, Kolar District, Karnataka, India" is a solar energy based electricity generation project located at Yalesandra Village, Bangarpet Taluk, Kolar District in Karnataka. The project essentially involves installation of 12 Nos. of 0.250MWp capacity solar arrays totaling to an installed capacity of 3 MW. The primary objective of the project is to effectively

demonstrate the use of renewable solar energy to meet the rising demand for energy in the region and to improve the quality of electricity supply. The project activity replaces anthropogenic emissions of greenhouse gases (GHGs) in the atmosphere by displacing an equivalent amount of electricity generated through the operation of existing / proposed fossil fuel based power plants implemented by KPCL and connected to the BESCOM network. The estimated annual average amount of emission reduction due to the project activity for a crediting period of seven years is 4,220 tCO2e per annum.

Sustainable development benefits outlined in the PDD :

PROJECT NAME	SOCIAL WELL BEING	ENVIRONMENTAL WELL BEING	ENVIRONMENTAL WELL BEING	TECHNOLOGICAL WELL BEING
	•The project activity produces power from a renewable source i.e. solar energy. As such, the project activity diversifies the energy sources and shall be a model case for demonstration of use of unused waste lands towards use for establishing solar power plants •The project helps to reduce the demand-supply gap in electricity in the state. The project helps to improve the quality of power at the tail end of the grid, thereby enabling the local population to access high-quality power for their social and economic activities •The project activity also leads to employment of local people which provides boost to the local economy .	•The project activity creates job opportunities for local people during construction and operation period. The project activity provides business opportunity for local stakeholders such as suppliers, manufacturers, contractors, etc. •The solar power project, being an innovative and one of its kind project activities in this part of the world, creates unique set of skills amongst the workers, operators and other local people employed under the project. These skill sets can be highly useful for their career growth as well. •This project helps in reducing the demand-supply gap by pumping the electricity produced into the local grid.	• The project utilizes solar energy for generating electricity which otherwise would have been generated through alternate fuels (most likely – fossil fuel) based power plants, thereby contributing to reduction in pollutant air emitting into the atmosphere including GHG emissions. •The project uses waste lands for the installation of the solar panels , thereby reducing the GHG emissions	• The photovoltaic modules are made of mono-crystalline solar cells, which are connected in series and parallel modes to give the required output. Module technology having high cell efficiency, reduced size and high reliability is being utilized. •The project activity demonstrates the effective use of solar energy technologies for improving the quality of power supply at the tail-end of the grid. •The project activity showcases the effective use of Supervisory Control and Data Acquisition (SCADA) system forboth local and remote control and monitoring of the SPV system.

	The project leads to improvement in rural lifestyles and infrastructure development in the areas around the project such as improvement in the condition of roads connecting to the project site.	Also, by feeding the power into the tail-end of the grid, the project improves the quality of power supplied to the tail-end users. •Sericulture activities, one of the main economic drivers in the project area, will see improved productivity because of the improved quality of power to be supplied from the project. •The project activity also creates an opportunity to showcase the creation of additional revenue streams through generation of carbon credits by seeking CDM status for the project.		

Our Independent Assessment

The solar plant has contributed significantly to the electricity generation in the region. The company official claims that the CDM project at Yelasandra has been set up with the objective of generating clean and renewable source of electricity rather than CER trading. The plant has been instrumental in bridging the demand and supply gap of electricity in the state. There has been development of infrastructure around the project site due to the setting up of the plant. Moreover, the plant has been able to contribute to environmental well being in the region, no ailments, no water contamination, no air pollution, no water pollution has been observed in the project area. The number of people employed has been 13 for the solar power plant, most of the people of the region are engaged in agricultural, floricultural and sericultural activities, and the plant has not been a major source of employment for the people of Yelasandra village.

10. Project Name: Karnataka Municipal Water Energy Efficiency Project

Location: State: Karnataka, Hubli/Dharwad, Belgaum, Gulbarga, Mysore, Mangalore and Bellary

Project Description: The CDM project titled, "Karnataka Municipal Water Energy Efficiency Project "aims to reduce the energy required for bulk water service delivery from 19 pumping stations in six municipalities in the State of Karnataka, Southern India. The six municipalities are Hubli/Dharwad, Belgaum, Gulbarga, Mysore, Mangalore and Bellary. The project is expected to save 17.2 million kWh of electricity per annum which will reduce the volume of greenhouse gas emissions from the southern electricity grid by approximately 14, 465 t CO2-e each year.

Six energy conservation measures (ECMs) were identified to improve energy efficiency, which have subsequently been reconfirmed. These include:

- ECM 1: installing new, more efficient water pumps and pump components;
- ECM 2: optimizing the existing pumps which effectively means right sizing of the pumps and pump components (e.g. impellers);
- ECM 3: improving the main water flow distribution system (i.e. repairs of bulk water pipes);
- ECM 4: reducing water losses and unaccounted for water from various sources;
- ECM 5: optimizing pumping stations operations;
- ECM 6: optimizing the existing infrastructures through better metering and monitoring of water.

While this activity does not result in direct energy savings it is an important project activity.

PROJECT NAME	SOCIAL WELL BEING	ENVIRONMENTAL WELL BEING	ENVIRONMENTAL WELL BEING	TECHNOLOGICAL WELL BEING
Integrated treatment facility for Municipal Solid Waste at Bangalore, Karnataka, India		• Supporting the overall financial performance of the municipalities themselves, by reducing the unit cost of supplying water. • Supporting employment during the implementation and monitoring phase of the project activity	•Reduction in electricity leading to a lesser use of coal and other fossil fuels needed to generate electricity and this will reduce greenhouse gas and non greenhouse gas emissions including: carbon dioxide, carbon monoxide, SO2, NOx, mercury and particulates. •Training and education of the municipal water employees: This will create	

			awareness on the efficient use of electricity and proper energy management's positive effect on the environment. •The project will encourage a greater investment in municipal water •Utilities and provide more resources to reduce water losses through fixing leaks, and faulty pumps.	

Our Independent Assessment

The officials of the company were interviewed to understand the aims and objectives and also the benefits of the CDM project. An official interviewed named Capt. M.H.N. Swamy – Asst. Exe. Engineer who is in charge of pumping stations located in Hubli/Dharwad, Gulbarga and Belgaum stated that the objective of the project was to ensure 24 hours water supply to 30,000 households in each municipality. He claimed that the Social well being factor was met by the training and education of municipal employees. Beneficiaries are those 30,000 households in a municipality that receive `24' hour water supply. However no social activities such as building of schools, medical clinics, laying of roads has been initiated by KUIDFC since such basic infrastructure already exists in all municipalities.

Some employment was generated during the implementation stage of the project (replacement of pumps, civil works). Environmental well being has been met through reduction in water demand, reduced losses and less carbon emissions through use of energy efficient pumps. Reduced use of electricity leading in reduction of fossil fuels needed to generate electricity. The permission to visit the Mysore site was denied by the interviewee.

11. Project Name: India: Himachal Pradesh Reforestation Project – Improving Livelihoods and Watersheds

Location - District: Kangra (Dharamshala) and Bilaspur

UNFCCC Registration number - 4174

Project Description: The project titled 'Himachal Pradesh Reforestation Project – Improving Livelihoods and Watersheds' is spread over an area of 222,951 ha and covers the catchment

for major rivers of Northern India - Ravi, Beas and Sutlej. The project will be implemented by the Mid- Himalayan Watershed Development project (MHWDP).
The major objectives of the project are:

a) Improvement of the productive potential of the degraded land or watershed catchment areas and enhance biomass production and carbon stocks in degraded lands, and

b) Improvement of livelihoods and incomes of rural households residing in the selected watersheds of MHWDP, using socially inclusive and institutionally and environmentally sustainable approaches.

The four guiding principles of the project are: (i) adoption of native and locally preferred tree species for reforestation, (ii) involvement of the local GPs and small and marginal farmers in reforestation activities that will strengthen the ongoing watershed interventions, (iii) facilitation of technical, financial and capacity development support from MHWDP to reforestation activities, and (iv) distribution of carbon revenue to the village community (GP and farmers).

Sustainable development benefits outlined in the PDD:

PROJECT NAME	SOCIAL WELL BEING	ENVIRONMENTAL WELL BEING	ENVIRONMENTAL WELL BEING	TECHNOLOGICAL WELL BEING
Himachal Pradesh Reforestation Project – Improving Livelihoods and Watersheds	• The project proposes to involve local communities, particularly small and marginal farmers in plantation activities on degraded common lands, degraded forest lands and private degraded lands through planting of multi-purpose species and implementing sustainable forest	The project will generate employment through silvicultural activities such as nursery raising, site preparation, seedling transportation, planting, fencing and maintenance of plantations. About 343 person days/ha of employment is expected to be generated from the implementation of three models during the project period management practices	• The project seeks to restore highly vulnerable degraded lands - forest land (undemarcated forests), degraded community land and degraded and abandoned private lands in the Mid-Himalayan watersheds, which are subjected to severe soil erosion and unsustainable land use practices • The project activities will promote biodiversity conservation, soil conservation and environmental protection through planting and protection of native tree species, reduction in soil erosion and prevention of downstream siltation of water bodies.	

Our Independent Assessment

The company claims to provide socio- economic benefits by enabling year around access to NTFPs like Poplar, Eucalyptus, Teak, Sal etc, and thereby ensuring continuous livelihood security for the village communities located in and around the project area. The project further claims that the local farmers or the first stakeholders shall get a fair share out of the carbon revenue generated. This in turn will incentivize the farmers to bring more and more land under tree plantations and thus earn credits. However, the outcomes of the project in terms of access to NTFP and village common land for the purpose of grazing vary according to the level of infrastructure availability at the village in question. For instance, the problem of water logging is common in most of the peri-urban and urban localities within the project area acts as a hindrance in the process of efficient reforestation. Apart from the issues surrounding NTFP access and grazing land access, the project also claims that the process of preparing a species basket for the purpose of reforestation shall be highly inclusive, prioritizing those species that economically benefits the local farmers. Again there exists a high degree of village wise variation in terms of active farmer participation in such discussions.

12. Project Name: Hydroelectric Project in Kinnaur District in Himachal Pradesh

Location - District: Kinnaur

UNFCCC Registration number - 4993

Project description: The project titled, 'Hydroelectric Project in Kinnaur District, Himachal Pradesh activity has been devised to alleviate acute shortage of electricity generation capacity in the Northern Region of India especially at the time of system peak load by developing a 4 X 250 MW renewable and versatile run of the river hydro power project at Karcham & Wangtoo on the river Satluj. Jaypee Karcham Hydro Corporation Limited (JKHCL) is executing the project. The project activity will provide 4463.88 GWh (90% dependable energy) per annum of renewable energy and provide 1000 MW peaking power throughout the year. In doing so, it will delay the necessity of construction of either a coal or gas or oil fired thermal power plant of similar capacity to supply to the primarily fossil fuel based regional grid, leading to reduction of Carbon Dioxide (CO2) emissions in the atmosphere.

Sustainable Development Benefits outlined in the PDD

PROJECT NAME	SOCIAL WELL BEING	ENVIRONMENTAL WELL BEING	ENVIRONMENTAL WELL BEING	TECHNOLOGICAL WELL BEING
Hydroelectric Project in Kinnaur District in Himachal Pradesh	•The project activity would raise the medium term employment opportunities for the local people	During construction and operation phases of the project, employment would be generated for	The project activity utilizes hydro resource for generating electricity which otherwise would	•The project activity envisages installation of high efficiency turbines and generators and the power will

	during construction phase. Further on continuous basis, employment opportunities would be available for local inhabitants during life time of the project for operation and maintenance of the project •The project activity will support the northern regional grid for sustained and quality supply of power for the local community. It will involve interalia construction of a 10+2 grade school, an industrial training institute, a 40 bedded hospital besides up-gradation of existing roads and bridges in the hilly terrain which would uplift the social life of the surrounding villages	the local population. Further, the business opportunities are enhanced by the project activity for local stakeholders such as consultants, suppliers, manufacturers, contractors etc during the implementation phase. The project activity would contribute to the economic well being in the region over its entire life time.	have been generated through alternate fossil fuel based power plants, thereby contributing to reduction in specific emissions (emissions of pollutant/unit of energy generated) including GHG emissions. Furthermore, as hydro power projects produce no end products in the form of solid waste (ash etc.) during operation, they address the problem of solid waste disposal encountered by most other sources of power. A comprehensive catchment area treatment plan has been formulated comprising of plantation, construction of check walls, pasture improvement etc.	be transmitted at high voltage to ensure low losses. Moreover, the technology being used is well established, most updated and environmentally safe. •The technology proposed for the project activity is environmentally safe and sound.

Our Independent Assessment

The Karcham-Wangtoo hydro project is one the largest hydropower projects undertaken by the private sector. However, several villagers faced a number of problems during the construction of the project. There were complaints of damage caused to their houses due to underworks of the project, the compensation for the damage is supposed to be paid by the company itself. The employment opportunities provided for the project were minimal and many outside labourers were hired for the construction of the project. The company has spent almost Rs. 650 million for various local development activities in the region as well as construction of the National Highway in the region. It has set-up a Higher Secondary School, a multi-specialty 40 bedded Hospital and an ITI in the Project area to assist in the socio-

economic development of the area. Afforestation and construction of fish seed farm were measures taken up additionally on the environmental management front. Recently there were reports of seepage in the Karcham –Wangtoo project tunnel which caused a lot of inconvenience to the local stakeholders in the area, however the tunnel repair work was resumed by the company in majority of the region.

13. Project Name : HYDROELECTRIC power project by SJVNL IN HIMACHAL PRADESH

Location - District: Kinnaur

UNFCCC Registration number - 4568

Project description: The Rampur Hydroelectric Project (RHEP) is a run-of-river project located near the town of Rampur in Himachal Pradesh. The total installed capacity is 412 MW. The project, located on the River Satluj will and utilize de-silted water of 1500 MW Nathpa Jhakri hydro power project. The project proponent for RHEP is Satluj Jal Vidyut Nigam Ltd (SJVNL). The purpose of the project activity is generation of electricity using the hydro energy potential available in the River Satluj. The generated power will be exported to different states1under the NEWNE Grid 2 as per the power purchase agreement between the states and the project promoter. This will improve the electrical supply to the existing consumers, especially at peak times. The present project under consideration is a green field project and the plant will be capable of generating approximately 1,770 GWh in a ninety percent hydrological dependable year. The hydro energy generated by the project will replace the fraction of thermal power supplied by the NEWNE Grid to the states. The project activity will result in ~1.407 million tCO2 net emission reductions annually. Thus the generation from RHEP will result in reduction of the greenhouse gas emissions and will help in achieving a low carbon development path for the state and the nation.

Sustainable Development Benefits outlined in the PDD

PROJECT NAME	SOCIAL WELL BEING	ENVIRONMENTAL WELL BEING	ENVIRONMENTAL WELL BEING	TECHNOLOGICAL WELL BEING
Hydro electric power project by SJVNL in Himachal	•The project activity will support various measures for supporting the livelihoods of the affected families - These include support for income generation activities, award of small contracts to local people, hiring of vehicles from the	•Poor and inadequate power supply is often identified as one of the bottlenecks to economic growth. The project activity will provide electricity to the households thus alleviating the power shortage which proves to be	• RHEP is a run-of-the river project and utilizes the water diverted from the Nathpa Jhakri tailrace. Hence there are no requirements of a new dam construction to divert the water, de-silting chambers, forest submergence	•The project activity envisages installation of high efficiency turbines and generators and the power will be transmitted at high voltage to ensure low losses. •The technology is produced locally and hence no technology

	affected families on lease basis, employment in the project for the landless and houseless people subject to their suitability and availability of vacancies. In addition, the children of the affected families are being sponsored for acquiring technical skills through industrial training institutions unpredictable supply of fuel and its costs thus scaling up generation investments. •The project is operating a mobile health van that regularly visits the project families as well as the local residents ensuring complete care, treatments, health and hygiene awareness amongst them. •Infrastructural facilities in the form of grants for schools and colleges are also being provided apart from financial assistance for small infrastructure development like buildings, school rooms, school play grounds, foot paths,	a hindrance to the economic growth of the region. •Business opportunities will be enhanced as a result of the project activity for manufacturers, contractors, suppliers etc. •The generation of hydro power also removes a critical barrier of	or any additional land inundation. •The project activity generates clean and green power thus causing negligible emissions of green house gases. This also reduces the dependence on fossil fuels for power generation thus conserving the natural reserves. •The project activity also promotes and supports compensatory afforestation.	transfer might take place.

	foot bridges, access roads, street lighting etc •The project is also providing support for the construction of a bus station at Rampur, construction of senior secondary school; and widening of road. •The project ctivity's contribution of power supply towards the NEWNE Grid will help uplifting the social life of the people by ensuring a sustainable and reliable electricity source for the region.			

Our Independent Assessment

The hydropower project has been able to provide ample employment opportunities to the local villagers as per the provisions of the state government. The Project Affected Families have been given preference and have thus been offered several prospects of employment. Employment has been offered to the villagers according to the availability of manpower for the project. The project is capable of generating clean source of electricity, the six power generation units have been already commissioned in the area. It has been recorded that the villagers faced inconvenience due to muck dumping in the area. The essential facilities like establishment of schools, provision of healthcare facilities are minimal in the region. The company has keenly considered the plight of the displaced families due to the project activity This facility will be extended to all villages in the project affected in the. SJVNL has also been committed to compensate for the crop damages due to the project activities. All these aspects have been considered at the time of actual implementation of Relief and Rehabilitation package to the people rendered houseless/landless.