

MAUSAM

...talking climate in public space

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The Jindal Steel Plant, Bellary, Karnataka

In the Bellary region of Karnataka in South India, and not far from the picturesque Hampi Ruins – of the medieval Bijayanagara Empire – on the stony banks of the river Tungdabhadra, stands the new and glittering empire of the steel magnet Jindals (see articles inside). The mega steel plant is complete with its own airport, tree-line avenues, and a huge sprawling campus guarded by a private security force. According to the Jindal website, it is a profit-making and growing concern, which symbolizes India's industrial growth, ensuring the growth of the GDP and the national economy—something that the country can be 'justly proud' of. We saw it all from the top of a hillock at Torangulu – a nondescript, dusty and dirty shantytown/village – that adjoins the Jindal complex. We also saw the walls of the complex

The space is not lost yet...

When *Mausam* set in about a year back, with the aim to initiate persistent and critical dialogues in 'public space' on the capitalism-induced climate change and its bogus market solutions, we had not foreseen certain bottlenecks that would prevent us from keeping it going with the promised regularity. However, finally, we are back with this new issue, sincerely regretting the delay. In an attempt to make up for the lost time and the interrupted debate to some extent, this issue features more stories, covering a wider spectrum.

Mausam will now come in time, and the debate will grow stronger and wider... We will continue to challenge the 'intellectual fiefdom' established by governments, profiteers, and 'experts' of various shades and hues on issues of global warming and its solutions by providing space to alternative view points and voices, which are often wiser and more sensible. We invite your comments, views, suggestions, and, of course, contributions stories, reports, analyses, opinions, case studies, anecdotes, and facts to enrich the public space *Mausam* has sought to create.

'Mausam' in Hindi means 'climate'.

running along the visible horizon to our left... and to our right. Whatever is inside the walls is now Jindal's, though the villagers accompanying us pointed out the village land inside. It seems that the area of the enclosure increases every year, and the Torongulu village shrinks correspondingly. Looking at the mighty plant, its gigantic roaring furnaces, and the black and brown and white smoke coming out of the rows of tall and thick chimneys, it all seemed so inexorable! Who stops the Jindals from their 'just' conquest?

The villagers of Torongulu were, however, not at all impressed by the shine and the show. They had seen it all... and suffered. Day in and day out, the smoke from the plant blackens their homes and whatever little crop is grown. The effluents from the plant drains into the water the villagers use, polluting it beyond redemption: 'It is dust, dust, and dust... especially when it rains. The wind and the rain carry the dust to the village. Everyone suffers from it, especially the children and the elders.' One after another, the villagers told us about their misery... and their anger against the company. We stood at the compound of the Torongulu panchayat office and the villagers also showed us the local health centre nearby, which, they said, had no facilities and was good for nothing. An open drain full of raw filth and medical waste runs in front of the 'health centre' and stank like hell. We were told that the company runs a plush hospital inside the plant, which is out of bounds for the villagers.

'The Company promised us jobs and good medical care and roads once the plant comes up. Once we gave up our lands they forgot all those promises', the villagers said in unison. 'The plant is like a foreign land that permanently shuts us out, and we get nothing but misery out of it', they said. Only a handful of villagers got employment at the plant, and that too when the construction was on. After that, there was nothing. And, on top of that, every year they take away more lands of ours... soon we will be left with no land at all' said they.

It is perhaps an incidental fact that the Bellary plant is one of the biggest successful CDM (clean development mechanism) projects in the country and it earned several billion rupees selling its cleanliness in the international market. The money coming from the sell of carbon credits boosted its other incomes, like making the company more 'blue-chip' and considerably escalating its stock prices.

Of course, nobody in Torongulu ever heard of this.

The MSPL wind energy plants in Karnataka and the Satara and Supa wind energy plants in Maharashtra
On our way to the wind mills at Sogi-Govindapur (see the report on the project in this issue), we had to take a road that ran along the large Tungabhadra reservoirs. It

was a bone-shaking, bumpy and dusty ride up to the Govindapur village, from where a for-the-moment unemployed civil engineer took us to the moderately high plateau where the wind turbines are located. Though the road was unspeakable, it was an incredibly beautiful area: thick black clouds hovered overhead on a slate-grey sky, and the last sun rays painted the sunflowers golden-yellow through which the road passed. After the sunflowers came the fields full of ripening tall corns, and a tiny settlement of semi-nomadic 'gypsies', right at the foot of the plateau. We stopped at the settlement to talk to the women who were working in the field. The windmills were clearly visible now, on top of the plateau, and against the backdrop of the sky; they seemed to add to the beauty of the magical evening!

Can there be any discontent in this paradise? Can there be any wrong, lurking behind the benign windmills at the hilltop, which do not emit any smoke or pollute rivers, and literally produce clean and green energy? Surely, here is an alternative, and one that is working!

Unfortunately, the 'gypsy' women clad in their colourful rags thought otherwise. When asked about the benefits the village had got from this project, they said the windmills were an unmixed curse! 'These are monsters that make so much noise that we cannot sleep at night... the children are going deaf, and even the wild animals that lived in the hill forests are straying down to the village and raiding crops!', said a woman in her typical North-Indian accent. 'Moreover, they took our land for erecting transmission towers (*we saw them all around us, incongruous structures popping up here and there amidst all the sunflower and corn*). We got nothing in return—no money, no jobs, nothing. We cannot even go to the hills any longer to collect fuel wood or to graze our cattle. The company says it is their forest now, and anybody found entering it will be fined or arrested.' ...'The road, which had been built with the panchayat funds, was damaged because of the heavy trucks that brought company's equipment. The company did nothing to repair it. They built an alternative road in the hills.' ...'There is no redress,' the engineer informed us. 'If people dare to protest, the police come and threaten them with summary arrest.'

We went up to the windmills using the company road. The clouds by that time had come down and covered the hilltop. The fog was so dense that windmills were hardly visible. While we were waiting for the fog to clear, and trying to take some photographs, the uniformed security guards emerged from the fenced-off and 'restricted' project area. 'You cannot take photographs here. This land belongs to the Suzlon Company. You cannot even stay here without permission.' 'How can it be Suzlon's



land? This forest belongs to the government!' Our engineer friend protested. 'They have erected boundary pillars in the forestland, and completely illegally. There has also been no formal lease agreement with the government.'

As the security guards demanded identity cards from us and were evidently calling for reinforcement, we had to get down. The fog was just lifting as we were going down, giving us a glimpse of the huge blades of the turbines. Seen from upclose, they looked overwhelmingly oppressive.

The same feelings of power and oppression stayed with us as we climbed the lush green, rain-lashed, and misty highlands of the Western Ghats in Satara, Maharashtra. Up there, one could see rolling meadows, small streams, and roaring waterfalls. In this almost ethereal landscape, the entire horizon is full of windmills, sentry-boxes complete with guards, and barbed-wire fences.

Local activists accompanying us were talking about the raw deal the villagers got from Suzlon, the company that set up and effectively controls (usually on a turnkey basis, for their client companies) most of the wind energy generators in Maharashtra and Karnataka. The lands were acquired forcibly or fraudulently, usually bribing one or two leaders of the community. There were protests but all short-lived. The company was too powerful for the likes of the tribal villagers of Satara to put up any organized and prolonged resistance.

We also learnt about how the plateau (or, a large chunk of it) was going to be messed up for good; where the windmills end, a new mega real estate scheme called 'New Mahabaleshwar' (the 'old' Mahabaleshwar, the colonial hill station of Maharashtra apparently has no more space left for new townships and hotels) was coming up, and a large bauxite mine would start operating soon. Together with windmills, these projects will destroy the area's biodiversity and displace thousands of families from their ancestral lands.

From Satara, we went to Supa and then onwards to the village of Sanajahanpur. Small hills surround the tiny village, which has lost almost all its agricultural land and pasture (see Mausam, inaugural issue, for greater details) to the 'celebrated' Tata windmill project, which has earned such a 'clean' reputation that it not only sold carbon credits worth crores of rupees through the Kyoto market mechanism, but was also subject of non-Kyoto voluntary 'offset' certificates (CO₂ Focus). The sarpanch (the headman) of the village told us categorically that the company has 'duped and fleeced' him. 'I did not understand what was happening', said he, 'The Suzlon (here too the project developers are Suzlon) people made so many promises: jobs to every villager, good roads, money for the village temple, new school

buildings, health facility, and so on. Nothing materialized. Meanwhile, the company simply took our land, and posted security guards everywhere so that we cannot use it anymore.' The villagers told us that the land deal was not even legal because they still retain the legal ownership of the land. In spite of that, 'the companywallahs' do not let them go anywhere on their land!

It will be good to remember that all these windmill projects are making bucketful of money by showing that because they do not burn fossil fuel they are 'clean' and, hence, entitled to CDM benefits.

Who says that it takes a Quixote to see monsters in a windmill?

The Tata Refractories, the Bhusan Steel, and the Hindalco Smelter in Orissa

We went to Orissa immediately after the rains; the roads were still slushy and the trees (whatever is left of them) stunningly green. It seemed that the entire hilly and forested terrain stretching from Keonjhar to Sambalpur and Rourkela was being frenziedly mined (for iron, coal, and bauxite) and industrialized; the skyline full of chimneys belching foul, noxious smoke, the rivers red with toxic effluents, the hills deforested and dug up like never before.

In this rapidly 'developing' and 'industrialized' landscape, we found one after another Jindal re-run. It did not matter in the least which factory we visited and which village. Everywhere, people are either helplessly cursing their lot or angrily articulating in resistance.

And everywhere, the air is chockfull of fly ash and other toxic particles, the crops are being mercilessly destroyed, and people are suffering both from water-borne and respiratory diseases.

On our way to Jamkani, the site of the Tata group's 50-year old plant – the Tata Refractories – we saw Ratan Tata beaming at the poor world below from a large life-size hoarding. Not impressed, the villagers are terribly angry. Beyond the village limits rose the high wall of the plant, and stacks of chimneys. The villagers took us to the wall to show how the effluents from the plant are discharged through a drain outside the wall and diverted directly to the villagers' fields. 'It is so toxic that it ruined our only pond,' said they. We saw the pond too, and people bathing in the stinking, black water. 'What will they do? We all know that bathing in the pond means skin ailments and other diseases. But, that pond is all the water we have!' said the villagers.

“We do not have any safe drinking water because of the company. The soil is full of fluoride, and there are many victims of fluorosis at Jamkani. But, what does the company care?” shouted a young man. 'The village does

not exist for the Tatas,' said another, 'The factory simply ruins our fields, water, and lives.' 'There is no justice in this world', said an old man, 'All of us, after being displaced by the Hirakud Reservoir, came here and made this jungle habitable. When the Tatas came and asked for land, we gave it to them willingly because we thought that a factory here would mean employment for the villagers. Initially, they employed some of us. But not now. The Company has forgotten about us, and all the promises it gave while setting up the plant.'

At the Naradihi village near the Hindalco Plant of the Birla group, a middle-aged woman burst into tears, 'Tell us how we shall survive? The smoke and the effluents from the plant make our lives a living hell. On top of it, the crop is either ruined or refuses to grow. When we try to approach the company, the security guards throw us out. Where will we go now?' ... 'We have been displaced once by the Hirakud Dam. Now it seems we will have to move once again', said another. The villagers took us near the plant to show how a large area of their rice fields had been nearly burnt by toxic gas from the factory. The paddy on the standing plants had become brick-red because of the pollution. 'Will the company give us compensation? Will they admit that they are playing with our lives and wrecking them?' demanded a local youth. Like the other questions the irate and harassed villagers asked, we had no answer to this one, too.

A few kilometres from this 'development' site, Hindalco is running a coal mine that is causing yet more pollution, and threatens hundreds of families with displacement.

Both the Tata Refractories and the Hindalco Smelter have large walled areas. But, the Bhusan Steel has the largest enclosure of them all. At the Thalkoloi village opposite a humongous campus of the Bhusan plant near Jharsuguda, angry villagers explained to us how the company obtained the land. 'They came to us and literally begged for land. Because we were all once displaced by the Hirakud Dam, we did not want to part with our land here. But, they told us many good things: pucca (concrete) houses for all, free electricity, schools, health care, and jobs for every family.'

'Like fools, we believed what they said', said a belligerent middle-aged woman, 'We should have known that once they have the land within their walls, they would not even think about us. Bhushan provided us with some of these huts you see here, and nothing else. On top of this blatant cheating, there is the dust. Whenever there is wind or rain, the dust comes and lies on top of everything. And we suffer, oh, how we suffer! But, why are we telling you all these? Can you stop the plant? Can you do something that stops the bloody pollution?' 'You see, we have complained to everybody: the local member of the Assembly, the sub-divisional

officer, and the pollution control board', said her husband, who could barely talk because of a bad bronchial trouble. 'Nothing happens. Nobody pays any heed. The pollution goes on as usual.' 'The company wants more land now', said a youth, 'It is eyeing on whatever little agricultural land we and the neighbouring villages are left with.'

And, the paradox is that all these three plants claim themselves to be CDM, and look for fat earnings from selling their 'emission reduction'.

The 'clean' development narrative

The grim narrative unfolded before us as we went from village to village, from one plant to another, and climbed down from one windmill to go to another mined up hillside. As we travelled, the stench and the clamour of both 'mainstream' and 'alternative' 'clean' projects grew; the development juggernaut inexorably crushing the forest communities and the peasants who came in its way. No irony can be grimmer and fouler; no lie more firmly entrenched and widespread. If some of the dirtiest, filthiest, and utterly corrupt projects publicly proclaim their 'community-friendly' attitude and responsible environmental behaviour, and their lies are accepted and vetted by the country's government and media, and also the 'international community', there must be something or everything seriously rotting somewhere and everywhere. And, when one remembers that each of these essentially un-'clean' projects will, in turn, allow another corporation somewhere else to continue with its 'business-as-usual' pollution, the joke turns into a crime against the entire humanity.

The clock is ticking, and effects of climate change are being felt all over the Indian sub-continent and elsewhere in the globe. Meanwhile, the Indian government is approving – in bunches – the so-called CDM projects, one worse than the other, and seemingly making a great case for putting up all its forests for sale through an 'improved' REDD (Reduction of Emission through Deforestation and Degradation, an ingenious scheme that says existing forests should be entitled for CDM status if they can be conserved) design. Besides, it brings out the meaningless National Climate Action Plan, and slyly keeps on arguing about the necessity of its not committing itself to any emission reduction targets.

Will we condone this? Will we let the lies continue and grow stronger? Or, we shall rip off the masks and let everybody see the real face of the famous India Inc and the 'holy' 'development process'?

The time has come for all of us to make a choice.

Soumitra Ghosh

(Soumitra Ghosh is a social activist and researcher associated with National Forum of Forest People and Forest Workers and NESPON)



Did the meteorological department mislead the nation on monsoon 2009?

The much-below-normal rain fall in most parts of the country during this year's south-west monsoon has now started to unfold its ensuing tragedy. About 250 districts out of a total of 600-odd have been officially declared drought-affected, with some more facing drought-like conditions. By the time the monsoon season (June–September) was a little more than half way on, and reports of farmers' suicides had already started appearing from Andhra Pradesh, Uttar Pradesh, and other states. Any random travel through the districts of Uttar Pradesh, Bihar, Andhra Pradesh, and Jharkhand would offer the sight of vast tracts of land lying fallow or with dried-up paddy seedlings. And, despite the government's assurances of adequate buffer stocks, retail food prices have already shot up so much, as to force the non-rich to cut down on essential consumption.

What went wrong? First, let us have a look at the rain-fall deficit for various regions of the country, and also for the country as a whole, – for the period from when monsoon starts (1 June) till July 29 (Table 1).

Meteorological Department) on 17 April 2009 reads like this:

'The IMD's long range forecast for the 2009 south-west monsoon season (June to September) is that the rain fall for the country as a whole is likely to be 'near normal'. Quantitatively, the monsoon-season rain fall is likely to be 96% of the long-period average with a model error of $\pm 5\%$. The long-period average rain fall over the country as a whole for the period 1941–1990 is 89 cm.'

That is way off the mark with the actual scenario, even during the first two months of the south-west monsoon. That can possibly be explained, however, by saying that this was an early prediction; kharif-sowing season was yet to begin; and many indicators were not as yet clear to understand the complexities of the monsoon season.

The late or 'second-stage forecast' was issued on 24 June 2009 when several states were well into the kharif-sowing season. It is far more crucial, as tens of millions of farmers depend on this to decide what to sow and when. The 'climatic window' of sowing kharif paddy

Table 1: Trend of rain fall in India during June–July 2009

Period ending	Overall in the country	North-West India	Central India	South Peninsula	North-East India
3 June 2009	-32	-40	-50	-14	-32
10 June 2009	-39	-31	-56	-15	-44
17 June 2009	-45	-26	-72	-21	-46
24 June 2009	-54	-49	-73	-38	-55
1 July 2009	-46	-45	-59	-31	-41
8 July 2009	-36	-50	-40	-18	-34
15 July 2009	-27	-43	-15	-12	-40
22 July 2009	-19	-38	3	-6	-43
29 July 2009	-19	-33	1	-15	-39

Source: an IMD release on 31 July 2009

So, this is turning out to be a 'bad' monsoon, as most regions have large rain-fall deficits, except central India (which recovered late in July). The grain belts of North-West India and Andhra Pradesh-Tamil Nadu are both badly hit.

What did the IMD predict ?

The first-stage forecast issued by the IMD (Indian

(which needs large amounts of rain water in 58 per cent of India's agricultural fields that are un-irrigated) extends till about 15 July. If rain fall is expected or 'predicted' to be significantly lower, farmers without access to good irrigation resources, use their back-up strategy of sowing crops that require much less water, like they would go for maize, millet, sorghum, pulses, etc. Thus, it was imperative for the IMD to make as

honest a prediction as possible, and they were supposed to be equipped for near-accurate predictions with latest computers, sophisticated computerized models, access to many satellite imaging systems, and, not to miss, thousands of meteorologists. This writer kept wondering all through July (and voiced this in meetings): what is the basis of the IMD's optimism?

And, what was their late prediction, on 24 June 2009?

South-west monsoon season rain fall
The IMD's long-range forecast update for the 2009 south-west monsoon season (June to September) is that the rain fall is likely to be below normal. Quantitatively, monsoon season rain fall for the country as a whole is likely to be 93% of the long period average with a model error of ±4%. The LPA (long-period average) rain fall over the country as a whole for the period 1941–1990 is 89 cm.

Monthly (July and August) rain fall
Rain fall over the country as a whole in the month of July 2009 is likely to be 93% of its LPA and that in the month of August is likely to be 101% of the LPA both with a model error of ± 9%. The LPA and coefficient of variation of rain fall based on the 1941–1990 data for all India and four broad geographical regions are given here [Table 2] along with the forecasts.

it now seems clear – that the rain fall in August would pick-up fully and there was no cause for worry. The same 'assurance' was given by even the Minister for Agriculture! Even in their very late 'prediction' released on 7 August 2009, the total rain fall was pegged down to 87 per cent of the LPA!!

So, again, what went so wrong? Was there any clear meteorological indication(s) available of the possibility of a weak south-west monsoon? Was the IMD aware of such a possibility? The answer to both seems to be 'YES'. How do we say that?

Let us first look at IMD's own report, where it is clear that they were aware that the ENSO (El Niño Southern Oscillation) conditions were developing in equatorial Pacific, starting in May 2009 itself. El Niño conditions, or warming of sea surface in the equatorial Pacific, are known to weaken the south Asian summer monsoon, subject to a few other conditions, as the IMD had noted in the same 24-June release.

Since the middle of April 2009, ENSO-neutral conditions are prevailing with positive SST anomalies [meaning higher-than-normal sea-surface temperatures] observed over the equatorial Pacific from the beginning of May. The latest observations and forecasts from both dynamical and statistical models suggest high probability (about 60%) for El Niño conditions

Table 2: The IMD's prediction on rain fall on 24 June 2009

Area	Long-period average (%)	Coefficient variation (mm)	Forecast (% of long-period average)
All India (June to September)	890	10	93
All India (July)	293	13	93
All India (August)	262	14	101
North-West India	612	19	81
Central India	994	14	99
North-East India	1429	8	92
South Peninsula	725	15	93

Source: an IMD release on 24 June 2009

It may be noted that the IMD said that the most crucial July rain fall will be just below normal, whereas the important August rain fall will be above that—not really alarming or bad for paddy sowing. Only North-West India was 'predicted' to be having a significant shortfall.

As late as 31 July, the IMD was still assuring – wrongly,

to appear during the monsoon season. The probability for ENSO-neutral conditions is about 40% and that for La Niña is negligible.

It is important to note that other factors such as the Indian Ocean sea-surface temperatures also influence the monsoon rain fall over India in

addition to El Niño and La Niña events. Forecasts from few climate models suggest possibility of the development of a weak positive Indian Ocean Dipole event during the 2009 monsoon season, which may not have much impact on the Indian monsoon. However, IMD is carefully monitoring the possible evolution of El Niño conditions over the Pacific and the Indian Ocean Dipole.

The developing El Niño conditions, along with the absence of any countering sea-surface temperature condition in the Indian Ocean (as happened in 1997, thus preventing a drought in India despite El Niño conditions in that year), should have alerted any professional agency – and the IMD is supposed to be a 'big one' – about strong possibility of a weak south-west monsoon.

The US Department of Agriculture, in its GAIN (Global Agricultural Information Network) Report (no. IN9086), released on 29 June 2009, had repeatedly warned that the 'window' of kharif paddy sowing, as well as those for corn, sorghum, millet, etc., would soon end, and warned of a possible drought.

The window of opportunity for planting of most kharif crops (rice, coarse grains, soybeans, peanut, cotton, and pulses) will be over by mid-July. If rains come in the next one week, planting operations will pick up. Otherwise, the country will be heading for a drought, which could be more serious than the 2002 drought, which resulted in significant crop losses.

In some major rice-growing states, such as West Bengal, Orissa, Chhattisgarh, Bihar, and Uttar Pradesh, the crop is mostly rain-fed and dependent on monsoon rains. Although rice is mostly irrigated in the major surplus states of Punjab, Haryana, Andhra Pradesh, and Tamil Nadu, the crop is still dependent on monsoon rains for replenishing groundwater reserves and reservoirs required for irrigation... What is hurting the crop more this year is high surface temperatures (4 to 5 degree Celsius above normal), which is causing high evapo-transpiration. The lack of rains will also result in low fertilizer application, which also will have a negative impact on yields.

The NASA MODIS satellite images, showing El Niño conditions developing in equatorial Pacific, were also available to IMD (as they were to this writer, a non-specialist science activist) as early as June 2009 or even earlier (Figure 1). The first pair compares the more

developed El Niño condition on 25 June 1997, with developing El Niño conditions on 16 June 2009. Notice the already warming equatorial Pacific water (yellow and red colours) in the middle of the second image, extending from the coasts of Peru and Ecuador.

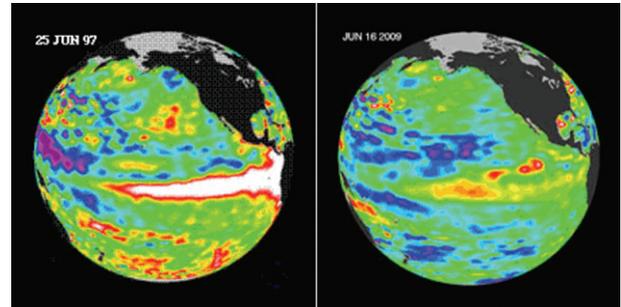


Figure 1:

NASA satellite images showing El Niño conditions

Source: NASA website

A second NASA satellite image taken in late July 2009 (Figure 2) more clearly shows the El Niño conditions over the same area, indicating strong possibilities that the rainfall during the remaining part of the S-W monsoon is likely to be weaker than normal. That is exactly what happened, with August rainfall till date (15 August, ironically our Independence day, without any sign of the Indian people getting independence from these 'disasters by design'!) being far from the 101 per cent of LPA that IMD predicted !!

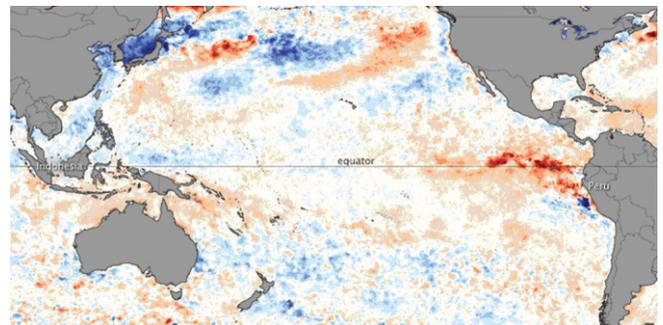


Figure 2:

Red and brown parts show higher-than-normal sea surface temperatures

Source: NASA website

Yet, throughout the month of July, the powers-that-be kept on repeating statements like 'no cause for concern', 'rain fall will pick up', and so on, despite the abundance of evidences that suggested otherwise... and the media also kept flashing these statements all over the country. The result was that people were misled into believing that there were hardly any options left to prepare for the looming drought!! Only towards the second week of August, by which time the damage was already done,

did the government admit and start talking about getting prepared for a disaster!!

And, farmers in large swathes of the country, along with the poor and lower-middle classes, are paying the heavy price of this careless (to use a soft word) folly of our 'professional' weather-persons. At last, the Indian government and the IMD have woken up from their callous slumber, and are sending messages like 'Weathermen warn: less rain' on 10 August or 'Centre advises states to adopt water-saving technologies for rabi crop' on 13 August, thus writing off the most important cropping season in India in one stroke!! And, all these are happening so casually in a country where we are repeatedly reminded that the livelihoods of about 650 millions depend on agriculture and the diet of the other 50 millions is also dependent on what the former produce.

A timely warning from the IMD and the Indian government could have alerted tens of millions of farmers, and prevented them from sowing paddy where irrigation is scarce. Bigger and more resourceful farmers have managed to save part of their crops by spending large amounts of money in pumping out groundwater for irrigation, leaving the smaller farmers even more parched. Those farmers in the 6-million-plus hectares, who have not sown paddy due to lack of water and left their fields barren, have at least saved the sowing costs (and the debt from moneylenders) and labour. A timely warning would also have guided them to sow – when the climatic 'window' was 'open' – crops requiring much less water. Now they are saddled with ruined paddy in their dry fields, lost investments, and, last but not the least, lost opportunity to get some return from other crops. Is it any wonder that desperate farmers have started committing suicide (despite government obfuscations)? It is not only that the kharif crops that have taken a big hit, rabi crops will also suffer, as there will be very little groundwater available, the conditions made worse by desperate and indiscriminate pumping out of water to save at least some parts of the planted crops. To make matters worse, reservoir levels in most of our river-basins are running very low!!

We have not even taken up the issue of possible changes in South-Asian summer monsoon in future due to global warming. Sophisticated modelling studies (by the Purdue University, by renowned climatologist James Hansen at GISS, etc.) are indicating both a backward shift in time and a decrease of total rain fall during south-west monsoon, along with change in regional and temporal distribution. To cope with these changes, when

they become prominent, we will need a dependable, competent, and sensitive weather agency / meteorological department. Will we get that?

And, it is not only the always-abused food producers who are paying the price. The consumer price index for rural and manual workers have gone up by over 11 per cent, even more for urban non-manual workers (whatever the government figure is, one visit to the nearby weekly bazaars bears this out)—all on the back of a weak monsoon and the anticipated food shortages. Economic 'pundits' are predicting at least a one per cent hit to the GDP growth from this and the consequent drop in rural demand. The non-farming poor, the lower middle class, and even the middle class are cutting down on food intakes, due to much higher prices, which will have obvious health impacts. The appallingly shameful 45 per cent malnutrition rate amongst our below-five children is sure to jump to an even more shameful figure, as possible alternatives to water-guzzling rice – pulses/soybeans (protein sources now gone beyond the reach of most of Indians) – were not sown due to lack of timely information on rain-fall patterns and the non-availability of 'kits'.

The IMD can say that they were not 'one-hundred-per-cent sure' about a weak monsoon, and they will be right. But, were they 'one-hundred-per-cent sure' about the rain fall to the tune of 96 per cent or even 93 per cent of the LPA? Obviously not! So, why did they not come out openly with the apprehension – based on clear meteorological signs – of a weak south-west monsoon? This would have prepared farmers across the nation to face the water shortage, which caused far more damage to the country and its non-rich mass? Was the failure in prediction caused by a fear that the newly elected government might lose the 'feel-good' factor it had managed to associate with its rule, if the possibility of a bad monsoon is broadcast?

The Indian people are paying a very heavy price, and they demand clear answers—if not for any advantage this time, at least in the long-term interest of the nation and its productive people. And, shouldn't the people's representatives – our MPs and MLAs – raise these pertinent questions? Well, that is another question, another debate!

Soumya Dutta

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Monsoon's extreme make over

When it rains, it pours. It seems, that is going to be the rule – not an exception – in future. In a maligned climate, triggered by global warming, monsoon is behaving strange. India's date with the monsoon has turned from being a steady affair into a convulsive one. Ashok Das, a telecommunication engineer in Mumbai, realized that in July 2005.

Though quite used to heavy downpour being in Mumbai, the July 2005 rain fall of 100 cm a day that month was beyond his imagination. 'Like me, everybody sensed something strange about the heavy rain fall,' he says. He had to stretch his imagination further next year. On an official visit to Rajasthan in August 2006, he witnessed the downpour in Barmer, one of India's historically rain-starved regions. Barmer got an unusual 75 cm of rain fall, submerging a vast tract of the district. Next year, Das, an Oriya in origin, got the news that was more surprising than what he witnessed in Barmer. One of India's hottest places – Titilagarh in Orissa – received 13 cm of rain fall within six hours on 3 September 2007. The same year in August, Sambalpur city in Orissa had received 31 cm of rain fall within 12 hours. 'For me, it is unusual but definitely real,' he says.

A maligned climate and the monsoon

Science has the definitive explanation for what is surmise to Das. There are increasing evidences that, with global warming, the number of extreme precipitation events would go up. The recent events are just an indicator of things to come. The Fourth Assessment Report of the IPCC (Intergovernmental Panel on Climate Change) notes an increasing trend in extreme events observed during the last 50 years. The IPCC further projects it to be very likely that hot extremes, heat waves, and heavy precipitation events will not only continue but become more frequent.

It is a global phenomenon now. During the first half of 2007 (June–July), four monsoon depressions – double the normal frequency – caused heavy rain fall and floods in India, Pakistan, and Bangladesh. Heavy rains during 6–10 June 2007 ravaged areas across southern China. Over 13.5-million people were affected, including more than 120 fatalities, due to floods and landslides.

In England and Wales, the period from May to July in 2007 was the wettest (41 cm) since record-keeping began in 1766, breaking the previous record of 35 cm in 1789. The extreme rain fall, with 103.1 mm of rain recorded in 24 hours during 24–25 June 2007 in northeast England, was followed by a similar event with 13 cm of rain on 20 July 2007 in central England. Both

events resulted in extensive flooding across parts of England and Wales. At least nine people died and the damage was estimated at more than 6-billion dollars.

In Germany, with 13 cm [the normal rain fall during 1961–90 was 7 cm], the country experienced its wettest May in 2007 since country-wide observations started in 1901. In sharp contrast, the previous month was the driest April since 1901 with an average of 0.4 cm (7% of the normal during 1961–90). A powerful storm system affected much of northern Europe during 17–18 January 2007, with torrential rains and winds gusting up to 170 km per hour. There were at least 47 deaths across the region, with disruptions in electric supply affecting tens of thousands during the storm. Initial estimates of losses were reported as 3- to 5-billion euros.

The worst flooding event in six years hit Mozambique in February 2007. An estimated 30 people were killed and 120 000 evacuated from the central Zambezi basin. In early May 2007, Uruguay was hit by the worst flooding since 1959. Heavy rain fall in portions of Uruguay led to floods that affected more than 110 000 people and severely damaged crops and buildings.

The July 2005 downpour in Mumbai broke the earlier record of Cherrapunjee, world's wettest place. Cherrapunjee had recorded 84 cm in a single day on 12 July 1910. Mumbai's own highest recorded rain fall in a single day was 58 cm; that was on 5 July 1974. Barmer's rain fall in August 2006 was five times the district's average annual rain fall. Heavy rains also lashed Spiti in Himachal Pradesh and Ladakh in Jammu and Kashmir in 2006. These are usually rain-shadow areas. The Kashmir valley that has been witnessing extreme heat wave was flooded for days of late due to extreme rain fall.

Monsoon's dilemma

The character of Indian monsoon has definitely changed, corroborated by various studies, including the IPCC reports. According to a study by P V Joseph, professor emeritus of atmospheric science, Cochin University of Science and Technology, Kochi, monsoon depressions have come down. In the 1990s, the country was reporting 12 depressions a year, which has come down to four per year, the study shows.

The NCC (National Climate Centre) in Pune has pointed out that one of the most significant consequences of global warming would be an increase in frequency of extreme precipitation events. However, the Indian Meteorological Department (the NCC comes under this

department) denies any link to global warming or any change in extreme precipitation events, citing long-term stable average rain fall. The NCC's data shows that rain fall has decreased in July while August is reporting more rainfall.

There are also studies that show that the monsoon is moving westwards and getting concentrated in few places thus giving high rain fall in few areas. A recent study by the NCC that analysed data from 100 meteorological stations came to conclusion that monsoon is gearing more towards western India, which explains the unprecedented downpour in Mumbai. 'Most of the extreme rain fall indices have shown significant positive trends over the west-coast stations and north-western parts of the peninsula (Maharashtra). Along the west coast, contribution from the heaviest events to the total seasonal rain fall has increased significantly,' says their report. Another study by Shouraseni Sen Roy and Robert C Balling of the Department of Geography at the Arizona State University, USA, found an increasing trend in the

patterns of extreme precipitation events from 1910 to 2000.

'The number of rainy days is decreasing in some pockets, but the intensity [of rain] is increasing in these areas,' said K Krishna Kumar, scientists with the IITM (Indian Institute of Tropical Meteorology) in Pune. The IITM studied rain gauge data available for the period 1951–2000 from 1803 stations across central India. This study found that, over the last few decades, the number of less rain-fall events have declined while extreme rain-fall days have increased. According to this study, the number of very heavy precipitation events has more than doubled.

Another study of extreme rain-fall events during the last six years by the CSIR Centre for Mathematical Modelling and Computer Simulation, Bangalore, points that the semi-arid region in the North-West India emerges as a high vulnerability area in terms of extreme rain-fall events. Its analysis found that most of the above 35-cm/day rain-fall events happened around the west coast of India (Tables 1 and 2).

Table 1: Extreme rain-fall events in India

Centimetres/ day	Number of extreme rain-fall events over 70–90 degree E and 5–35 degree N						
	2001	2002	2003	2004	2005	2006	Mean
25–35	447	332	547	186	405	220	356
35–45	86	81	57	55	75	24	63
45–55	38	42	16	26	39	10	29
>55	39	56	14	44	78	17	41
Total	610	511	634	311	597	271	489

Source: The CSIR Centre for Mathematical Modelling and Computer Simulation, Bangalore

Table 2: Regional occurrences of number of extreme rain-fall events

Centimetres/day	Number of extreme rainfall events (2001–06)	
	India	Bay of Bengal
>0.5	6,282,007	8,940,833
15–25	9,959	23,008
25–35	1,187	898
35–45	383	8
45–55	162	0
>55	330	0

Source: The CSIR Centre for Mathematical Modelling and Computer Simulation, Bangalore

The current monsoon is well on its way into the mainland and there are fears lurking. Mumbai on its first day with monsoon flooded as the showers coincided with high tide. What it demonstrates that the city is yet to

learn lessons from the great deluge of 2005. Elsewhere in the country, the reality of extreme precipitation is yet to reflect in our preparedness to fight such disasters.

Richard Mahapatra

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The Climate Politics: what do we learn from the financial crisis?

By now, millions of people around the world have felt the consequences of the 2008 economic collapse: lost houses, lost livelihoods, and lost land. But not enough climate policy-makers (and climate activists) seem to have noticed that the carbon markets being offered as a solution to global warming are cut from the same cloth as the financial innovations that made the economic crash one of the worst in history.

Revealingly, some of the same people were instrumental in thinking up both the carbon markets and the financial derivatives markets that led to the economic crisis. For example, Richard Sandor, a commodity trader and economics professor, is famous both for helping to develop interest rate derivatives and pollution markets. Sandor made a fortune during the boom years of the 1980s at Drexel Burnham Lambert, the firm of the junk-bond innovator Michael Milken. Sandor has also collaborated with Howard Sosin, who subsequently helped set up and head the financial products division that ultimately laid the AIG (American International Group) low to the point of having to be bailed out by US taxpayers to the tune of over 150-billion dollars. (AIG has used some of the payouts to lobby for a US carbon-trading system, hoping to gain from new commercial opportunities thrown up by the market.)

In the 1980s and the 1990s, with encouragement from a big Washington environmental organization, Sandor helped to develop the idea of pollution trading for which he was recently named as an ‘environmental hero’ by the *Time* magazine. In the 2000s, with handouts from foundations, Sandor set up the Chicago Climate Exchange, which today commands a small but growing segment of the carbon markets. Other derivative traders, including from ENRON, have also migrated to the ‘ecosystem services’ financial sector to manage funds and advise on the ‘measurement and monetization of land-use carbon credits’ and so forth.

The World Bank is another exponent of financial innovation that has tried to apply the same logic to climate change. Its former executive, Ken Newcombe, helped set up the global carbon offset market at the bank’s Prototype Carbon Fund beginning in the late 1990s. Throughout the period, Newcombe’s outfit influenced UN regulatory decisions and helped put the World Bank into a position to make money from attempts to compensate for the climatic damage caused by, among other things, fossil-fuel-intensive developments itself was underwriting in the Global South. As the market began to take off, Newcombe

moved on to the private firm, Climate Change Capital, a City of London boutique-merchant bank; then headed up the North American carbon-trading desk of Goldman Sachs before becoming the chief executive officer at the new carbon-trading firm C-Quest Capital.

Today, carbon trading is increasingly dominated by some of the same Wall Street and City of London firms made notorious by their role in the financial crash. Most carbon credits from the UN’s CDM carbon offset projects are now being traded by speculators in the financial markets. Some of the biggest buyers of such credits are Goldman Sachs, Morgan Stanley, Barclays Capital, Deutsche Bank, Rabobank, BNP Paribas Fortis, Sumitomo, Kommunalkredit, Cantor Fitzgerald, Credit Suisse, and Merrill Lynch. Financial writer Matt Taibbi has recently argued that Goldman Sachs has poured 3.5-million dollars into lobbying on climate policy in the hope that carbon markets will wind up diverting even more public money to Goldman Sachs than the energy futures market did.

Carbon credits are also now a magnet for hedge funds and other financial gamblers. These funds, banks, and other actors are not interested in climate change, but they do see carbon credits as an interesting new ‘asset class’ that could be very profitable. And, they can even make money by betting on the carbon market’s failure. In June 2009, Anthony Limbrick, chief investment officer of Pure Capital, a hedge fund, noted on the firm’s website that ‘[w]e think there’s a 30-per-cent chance [that] the [carbon] market collapses... That could create a *fat tail* (a very rare event with major consequences) for us to make money.’ Securitization of the type made famous by the financial crisis is also starting up in the carbon markets.

Also revealing was a brochure for a conference on carbon trading held in London in October 2008. The conference was called *Cashing in on Carbon*, and the organizers stated forthrightly that the conference ‘does not really concern itself with broader climate change issues... It is aimed squarely at investment banks, investors, and major compliance buyers and is focused on how they can profit today from an increasingly diverse range of carbon-related investment opportunities—hybrid and complex carbon credit structured products... how to identify investor demand for them in the US... derivative/synthetic carbon products... carbon linked notes... for Japanese retail investors... sub-index arbitrage strategies... productising carbon... access channels for producers...

speculators, proprietary traders, and investors.’

What does all this mean for the climate, for forest workers and forest peoples, and for concerned citizens generally? Well, for some clues, let us listen to Richard Sandor of the Chicago Climate Exchange, who in early 2008, as the financial crisis was developing, spoke strongly in favour of markets in forest carbon credits. Here is what Sandor said:

‘Frankly, the debate [over offsets] just makes me want to scream. The clock is moving. They are slashing and burning and cutting the forests of the world. It may be a quarter of global warming and we can get the rate to two per cent simply by inventing a preservation credit and

making that forest have value in other ways. Who loses when we do that?’

By ‘they’, Sandor means forest peoples and impoverished farmers. In his view, they are the cause of the forest destruction that his Wall Street solution will stop. This is the sort of conceptual understanding of climate, forests, and forest peoples that the public can expect from the big players in the carbon markets.

Larry Lohmann

(Larry Lohmann of Cornerhouse and the Durban Coalition for Climate Justice is the author of Carbon Trading: A Critical Conversation on Climate Change, Privatisation and Power, Dag Hammarskjöld Foundation, Sweden)

Metals are obstructing political visions

The mining and metal industry is a prime cause of the global climate crisis, yet its accountability is rarely under the spotlight.

In Orissa and its neighbouring states in India, the increase in mining and metal production in recent years has been phenomenal. The pollution control board sometimes seemingly fights a valiant battle to expose pollution in smoke as well as liquid effluents, and demands curbs on some of the worst excesses, without much success. But, who is studying the overall effects of the metal factories’ vast emissions?

These factories need excessive amounts of power, for which they invariably pay far below the going official rate. Part comes through hydropower, which means mega dams that incriminatingly cause enormous clearance of forests – generally primary forests – and of people off their land, permanently inundating their fertile fields and livelihood resource base. What comes through thermal power stations essentially means huge expansion of coal mining and manifold increase in carbon emissions, besides thousands of villagers’ lives made hell and livelihoods robbed of. Every major metal factory has its own captive coal-fired power plant, which pumps out large amount of greenhouse gases through its chimneys and causes major heating of the local atmosphere.

The mines themselves obliterate more areas of prime forests, destroying irreplaceable biodiversity, especially because most minerals are located on thickly forested mountains. Bauxite reserves in Chhattisgarh and Jharkhand are by now mostly mined-out, and deposits capping the great mountains in South Orissa and North

Andhra Pradesh are now under imminent threats, some of them outstanding for the primary virgin forests they have still kept alive, such as Niyamgiri, Gandhamardan, and Karlapat. Years of iron-ore mining on the mountains of North Orissa (as in Keonjhar) alongside the resource drain to feed countless sponge-iron plants there has already led to the drying-out of these mountains, with large tracts of forests destroyed and countless life-sustaining streams dead. However, no lesson was learnt from this humongous loss of natural wealth; rather more mountains are now under threat in North Orissa (including the famous Kandadhar, with one of India’s highest waterfalls), South Jharkhand, and the Bastar–Dantewada region of South Chhattisgarh. As for chrome and manganese, essential ingredients of steel, 98 per cent of India’s chromite is found in the Sukinda area. Rampant mining in Sukinda has earned the area a place among one of the ten most polluted spots on earth, in a report by the Blacksmith Institute (US) in September 2007. The quarried and mined-out hills covering large areas of Jajpur district call to mind T S Elliot’s *Wasteland*.

All this expansion in mining is causing a rapid decline in India’s forest cover, and therefore, in the capacity of forests to absorb the air-borne pollution. Mining also creates intense problems of dust, not to mention the major human-rights abuses it unleashes.. For example, the Kalinganagar industrial area of steel plants near Sukinda was the site of police firing that killed 13 adivasis in January 2006.

Besides profuse emissions, the mines and metal industry has a ravenous need for water. The production



of one tonne of steel requires and pollutes an estimated 44 tonnes of water on average (Ritthoff, Rohn, and Liedtke 2002). So, for every million tonnes of steel, 44-million tonnes of water is consumed or polluted. Orissa's steel output has increased from an estimated 2-million tonnes per year during the 1980s to over 22-million tonnes per year during 2002–07, and, before the recession, was set to increase rapidly to 40-million tonnes per year. How this industrial consumption will affect the cultivators is anybody's guess!

The pressure on resources is even more incriminating when it comes to production of aluminium. Producing one tonne of aluminium consumes over 1360 tonnes of water; so producing over a million tonnes of aluminium a year consumes/pollutes over a trillion tonnes of water. That is why – while groundwater level is already dropping in many areas, and canals and rivers are running dry for farmers – the metal industry's water consumption is often a target of local fury, as in the Hirakud Dam area in western Orissa, where farmers during the last few years have come in tens of thousands to a series of demonstrations against the steel plants of Bhushan and aluminium smelters of Vedanta and Hindalco. They have also drawn a symbolic *chasira rekha* (farmers' line) beyond which water could not be used for any purpose other than farming, and certainly not for metal factories.

So, India's key climate-change issue revolves around a large number of mineral projects, being strongly promoted and strongly resisted in many areas. Tata, POSCO, Hindalco, Vedanta, Mittal, Jindal, and Essar are among the companies building – or in the process to build – huge new factories. Do these projects represent a new vision of India catching up with the West—a long-overdue to overtake 'developed' countries? Or, could they be a new level of the same old story of exploitation masterminded from abroad, especially from the West?

These projects are increasingly coming to be seen as larger designs to loot India's prime, non-renewable assets, on a scale and speed that even the East India Company never dreamt of. In effect, in this neo-colonial framework, an outsourcing of metal production is taking place. Indian politicians' insistence that emissions from 'developed countries' have been far greater, and India and China have every right to catch up, has a strong but covert backing from businessmen and financial institutions in the West, where the real environmental/pollution costs are starting to be internalized in the form of taxes, etc., while subsidies on excessive quantity of electricity necessary to make a profit from production are much harder to obtain. The outsourcing is at several levels. In effect, the foreign financial institutions investing in Vedanta, Tata,

Hindalco, POSCO, and other such companies are buying up India's prime locations of mineral/forest and water resources, extracting whatever they want, and leaving the areas irredeemably degraded and polluted, while exporting most of the metals and profits for consumption abroad.

So, the people being harmed by Indian and Chinese reluctance to curb emissions are their own citizens, who suffer not only from unabated pollution and indiscriminate displacement but also from the local changes in climate and heating up of the atmosphere more than anyone.

The IPCC (Inter-governmental Panel on Climate Change) has acknowledged industrialization as a prime cause of global warming and climate change and has emphasized an urgent need to curb carbon emissions and other greenhouse gases. But astonishingly, it does not focus on the role of the metal industry and on the need to halt or reverse the past century's emphasis on metal consumption. Some of the main IPCC recommendations actually compound the problem, such as the promotion of biofuels. Biofuels are turning fertile food-crop fields into plantations aimed at feeding cars and planes, just at a time a serious worldwide food crisis looms. Using the biofuel euphoria to serve their interests, mining companies in India have been buying up excess lands in the pretext of planting biofuel plants. For example, Vedanta claims to be planting a million *jatropha* seedlings a year. Critics of biofuel expansion show that even in terms of greenhouse gas emissions, biofuels are worse than fossil fuels, and are strategically being promoted only to decrease dependence on politically unstable oil- and gas-producing areas such as the Middle East, Russia, and Nigeria (Lynas 2006).

Another key IPCC suggestion – worldwide promotion of a carbon -trading scheme – involves a massive scam: the so-called CDM (clean development mechanism). No one involved seems to really believe that the system of trading carbon credits can really help cut emissions. It is being promoted simply as a new way to make money out of climate change and pollution. The pollution from nearly 300 sponge-iron factories in East India is phenomenal. The blatant disregard for laws meant for regulating their air-, water-, and land-borne emissions are a frequent subject of censure by state pollution control boards; yet apparently having little or no effect at all. Many of these factories are actually receiving thousands of dollars of carbon credits each year for installing new technology that is supposed to limit their emissions. The reality of these sponge-iron factories is large-scale displacement of communities, unsustainably huge consumption of water, appalling health and safety records for their workers, and

pollution levels that have visibly gone up with the new, supposedly ‘clean’ technology. One of the worst, Jindal’s giant factory at Bellary, (Karnataka), is earning enormous sums through two CDM projects (Lohmann 2006a, see also *Dark are the clouds...* in this issue of *Mausam*).

CDM projects are approved and validated in India (Table 1), as in other countries, by an indulgent authority that clears projects almost as soon as they are submitted, without an adequate process of critical evaluation. The system reflects the way neo-liberal economists managed to capture the agenda of IPCC Working Group III, charged with drawing up responses to climate change (Lohmann 2006b).

Andrew Simms (2005) has promoted the idea that the debt which Third World countries have accumulated towards First World banks, etc., are more than offset by an *ecological debt*, and specifically the *carbon debt*, which the ‘developed world’ has accumulated and owes to less-polluting countries. A recent study applies Simms’ model to Orissa, focusing on the pollution and human costs emanating from NALCO (National Aluminium Company) at Damanjodi in South Orissa (Khatua and Stanley 2006).

The externality cost of carbon emissions alone is calculated at 85 dollars per tonne by a recent UK government report, giving around 1275 dollars as the carbon cost per tonne of aluminium (which emits 6 to 20

Table 1: Metal industry CDM projects in India

State	Total projects	Status				**2020 KCO,	***KCER issued
		*At validation	Registered	Under review	Correction requested		
Andhra Pradesh	15	8	7			4590	266(5)
Assam	3	2	1			286	
Bihar	2	1	1			331	
Chhattisgarh	8	6	2			6896	
Delhi	1	1				589	
Goa	1		1			147	
Gujarat	32	20	12			12050	169(4)
Kerala	2	2				267	
Karnataka	7	7				1012	
Jharkhand	3	3				492	
Haryana	4	3	1			699	41(1)
Madhya Pradesh	10	7	2		1	1909	
Maharashtra	20	16	4			3280	
Orissa	10	8	2			1715	
Punjab	2	1	1			392	
Tamil Nadu	14	11	2	1		2000	41(1)
Rajasthan	10	6	3		1	2171	
Uttar Pradesh	20	12	8			9726	136(6)
Uttarakhand	2	2				521	
West Bengal	15	10	5			7782	109(4)

(All the values are till 26 July 2009)

Source: <<http://www.cdmpipeline.org>>; <<http://cdm.unfccc.int/index.html>>; <<http://cdmindia.nic.in>>

* These projects are at the second stage of UNFCCC approval. Once the projects are validated by international validating agencies, these can go the non-Kyoto market (Chicago Climate Exchange, etc.) to sell their VERs or verified emission reductions.

** The total cumulative amount of CERs that the projects will collectively generate by 2020.

*** The amount of CERs or certified emissions reduction officially used. If handled by a broker of repute, these become secondary CERs and fetch the best prices. The number in parentheses denotes the number of projects that got issuance.

tonnes of carbon dioxide).¹ If other emissions and effluents, including sulphur dioxide, fluoride, HFCs (hydrofluorocarbons), spent-pot lining, and the toxic red mud, were properly built into the cost, aluminium's externality cost per tonne would be far above conventional estimates of 2000 dollars per tonne. And, when the real price of forest loss and human displacement is appreciated, the true costs of production of aluminium could be seen for what they are: far more than either the official cost of production that the metal is produced for, or the London-fixed price it is traded for.

Apart from the externalized costs, a major problem is that climate-change denial is alive and kicking well in India. Indian columnist Praful Bidwai (2008) puts this:

Indian policy-makers seem to be seeking solace in outright denial of the need to do anything about global warming at all, in particular, to undertake major GHG reductions. On April 2 [2008], Planning Commission Deputy Chairman, Montek Singh Ahluwalia, called for a 'comprehensive debate on the issue of climate change' because...there is 'an element of uncertainty' on whether climate change is as serious a threat as projected. [A report he released by an organization called the CSCCC (Civil Society Coalition on Climate Change), and its Delhi-based affiliate, the Liberty Institute, is available at <www.cscce.info>] attacks the principal conclusions [of the IPCC] and rejects any capping of GHG emissions as this would be 'counter-productive': undermine economic development, 'harm the poor', and probably fail to address climate change problems 'in a meaningful way'.

Instead it advocates 'economic development' (read, limitless market-driven growth) and yet more consumption, denies a link between climate change and the growing incidences of diseases [recently shown in a detailed report by WHO], and zealously demands privatization of water and other resources and the lifting of all taxes, tariffs, subsidies and entry barriers—to promote 'free enterprise'.

Moreover, Bidwai shows that the CSCCC is funded by extreme advocates of neo-liberal growth, representing the same nexus of climate-change deniers that skewed

the climate-change debate for many years in the West. George Monbiot (2006) had, in fact, earlier given an incisive account on the politics and funding of the climate-change denial.

Consumption patterns of aluminium are aimed at increasing India's 'abysmal' consumption of less than 1 kg per person per year to a figure close to the consumption level in the 'developed world', where a person on an average consumes 15 to 30 kg per year (Tamotia 2004). This is being done by increasing the use of aluminium in packaging and in transport and building materials, which amounts to far more than what is used in village electrification, for which 51 per cent of India's aluminium was reserved during 1975–89. Aluminium used in water-supply equipment (for mainly cosmetic reasons) as well as in packaging and saucepans is acknowledged to have dangerously raised the aluminium content in human bodies, where it collects in our bones and brains—a probable cause of cancers and Alzheimers.

In packaging alone, we all see the results in increased use of *gutka* foils and many other throw-away items such as TetraPak packaging of fruit juices. The manufacturing process of TetraPak is extremely polluting; it is impossible to recycle these packs effectively, and yet these have been promoted by cutting duties on aluminium:

When TetraPak, a European packaging company, wanted duties cut on a raw material, it hired Dilip Cherian, a Delhi-based lobbyist who charges clients 100,000 dollars a year. The company came out with a statement criticizing the duties. But, Cherian also attempted to create a groundswell of support for a duty cut from milk farmers too destitute to buy the cartons at present prices.

Dilip Cherian supervises the Strategic Planning and Public Affairs functions at Perfect Relations, India's biggest image management firm. A founder partner of Perfect Relations, Mr Cherian is widely regarded as India's image guru.²

Perfect Relations is also the PR firm hired by POSCO to try and offset the publicity gained by the anti-POSCO movement in Orissa.

Among the highest-paying customers of mining and metals companies are arms-manufacturing companies

¹ A previous report by the Department for the Environment of the UK Government estimated 56-223 dollars per tonne of CO₂ (Simms 2003). Richard Cowen estimates that producing a tonne of aluminium gives off emissions of 5.6 tonnes of CO₂ if the smelter is hydro-powered from a dam; and 20.6 tonnes if it is powered by a captive coal-fired power station.

² <www.indiaresource.org/news/2006/1059.html>, <www.perfectrelations.com>

whose factories and the wars they fuel also have huge, and little-studied, negative effects on the climate. Depleted uranium and aluminium from armour-piercing shells have created clouds of toxic dust, resulting in mysterious diseases (the ‘Gulf War syndrome’, etc.) affecting thousands of soldiers, let alone civilians, in Iraq and other countries. But, the problem is much greater than this. Aluminium powder is a widespread rocket fuel, and its nano-particles are a major pollutant in the outer space as well as in war zones. So enormous are the military applications of aluminium that a 1951 text, more open about the environmental costs and military values of aluminium than anything published since then, declared that no war can be won without ‘*using and destroying vast quantities of aluminium*’.

Signs of global warming are all around us. January 2009 has got hotter earlier than ever recorded. The best scientists give us just two years to start making 90 per cent cuts in greenhouse gas emissions. Yet, the political will for this is not even on the horizon yet. Adivasis perceive all too clearly the local effects of climate change, as they contemplate the deforesting and gouging out of mountains held sacred for centuries, and the heating up by new factories invading the land their ancestors cultivated. Their voices need to be listened to now, and their movements deserve widespread support. If we can heed them in time, they can teach us what it really means to live sustainably, according to our need rather than greed.

Felix Padel and Samarendra Das, with inputs from Hadida Yasmin

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Dark are the clouds: concerns from Karnataka

The Indian steel industry is the fifth largest in the world, contributing almost 4 per cent of the world's total steel production. The industry has attracted investments from some of the world's top steel producers, such as ArcelorMittal, Nippon, POSCO, and TATA. One of the important features of Indian steel production is its dependence on sponge iron. Over the past few years, with the rise in the global demand for steel, the sponge-iron industry has also seen a boom in India, witnessing extensive expansion in sponge-iron production. Sponge iron has become a perfect substitute for scrap, which otherwise feeds the steel industry. In India, steel producers who use the electric arc furnace or the induction furnace for making steel are primarily depended on sponge iron. Sponge iron, also known as direct reduced iron, is extracted from iron ore. The process of extracting iron ore is very polluting and, hence, extremely hazardous to the environment and human health.

The large steel makers who also produce sponge iron procure their supply of iron ore from large captive mines and regulated markets. However, almost 60 per cent of the total sponge-iron units operating in India are small-scale, and a majority of them is dependent on illegal mining. Besides, wherever these plants operate, air and water pollution from those enormously impact local communities. The states of Orissa, Chhattisgarh, Jharkhand, West Bengal, Goa, Maharashtra, Karnataka, and Andhra Pradesh are prominent in iron-ore and coal mining. It is in these states that the sponge-iron-producing plants have also mushroomed. Picking out just one case – say, the Bellary region in Karnataka – would very well illustrate the devastation unleashed by the unprecedented and unchecked growth of the sponge-iron industry.

India: the largest producer of sponge iron

De-licensed in 1985, the sponge-iron industry registered major growth in the decades that followed. Post-2001, India has emerged as the world's largest producer of sponge iron, accounting for 20 per cent of the global output. According to the Joint Plant Committee, formed in 2005 to assess the status of the sponge-iron industry in India, more than 250 plants are operating in the country with around 225 under commissioning and 77 undergoing various capacity expansions. In 2007/08, India produced close to 20-million tonnes of sponge iron.

The cost of this growth, however, has to be borne by the people in areas where sponge iron is being produced.

The rising pollution by the sponge-iron units has been consistently ruining the lives and livelihoods of local communities. Thick black smoke, contaminated water, depleting vegetation, falling agricultural production, premature death of domestic cattle, and deteriorating human health are some of the vile results of this process.

The case of Bellary in Karnataka

The fifth largest iron-ore contributor in India is the Bellary district in the southern state of Karnataka. It has a long history of extensive iron-ore mining. Though the first sponge-iron plant in Bellary was set up some 20 years ago, it is since 2004 that the number of plants has multiplied many-fold. Today, it has fast-emerged as an important sponge-iron hub in the country, with 31 sponge-iron units already operating and 25 more units in the pipe line. The reason is obvious—iron ore, the mineral required for this industry, is plentifully available in the region.

No compliance of pollution control norms

Kiran Kumar, Assistant Environmental Officer of the KSPCB (Karnataka State Pollution Control Board) based at the DPCB (District Pollution Control Board) office in Bellary, noted that about a year-and-a-half ago, none of the sponge iron units used to deploy pollution control equipment such as the ESP (electrostatic precipitator). The ESPs are highly efficient filtration devices that easily remove fine heavy metals and gas from the discharged air stream. Persuasion by the pollution control board resulted in convincing only four units operating in the Hospet Road area to run the ESP more regularly than others. Kumar further observed, 'I have been trying to convince the KSPCB to force the units to install an interlocking system between the power supply and the kiln. This mechanism will ensure regular running of pollution control equipment, because it automatically disconnects power supply to the kiln if the ESP is off.'

According to pollution control norms, sponge-iron units are expected to conduct round-the-clock air-quality check and forward the resulting data to the pollution control board via testing centres. There has been a consistent delay on parts of the units in submitting these reports; as a result, by the time the data reach the board office, it was already outdated and meaningless. To avoid delay in monitoring, the DPCB has come up with a facility for online reporting on air quality. Not inclined to abide by rules, the industry simply avoided submitting any online information.

‘First of all, they do not submit reports. Even if they do, the actual concentration of SPM (suspended particulate matter) has never been brought out in the reports submitted,’ a senior official stated, adding, ‘We all know that the concentration level is very high and anyone can feel that. But, in the name of supporting industries, the reports are made to show that everything is fine with the air quality.’ The only testing laboratory where the ambient air-quality standard data can be tested is at Dharwad. Again, according to some sources, the laboratory could also be pushed to giving reports favourable to the industry.

Illegal iron-ore mining

Today, Hospet and Sandur areas are known for illegal mining and cheap iron-ore supplies to the iron-ore crushers and sponge-iron units in Bellary. Ahiraj, an activist and a newspaper correspondent, says, ‘Since July 2006, 221 iron-ore crushers have been set up in the district. A task force comprising the deputy commissioner and DPCB officials was formed by the state government to probe into the issue of illegal mining. A report by the task force highlighted that the iron-ore crushers operated without permission in agricultural lands, and without proper machinery. Moreover, illegal mining was found to be the main source of iron ore that fed the crushers. The task force report declared that 150 crushers were violating rules and suggested that these should be shut down. Today, such crushers are operating in Malappangudi in Andhra Pradesh, just 10 kilometres away from Bellary.’

‘During a raid, the investigation team also inspected the Bellary Steel Plant on Anantpur Road. The unit failed to produce purchase invoice of the iron ore lying within the plant compound,’ commented Kiran Kumar. Noteworthy is the fact that most sponge-iron units in the district thrive on illegal iron ore purchased from the open market. The large ones like the Jindal Steel Works do captive mining, in collaboration with the State Mining Corporation. The deputy commissioner also brought to notice that the district faces an estimated loss of almost 230-crore rupees owing to the destruction of roads due to overuse by heavy transport vehicles carrying illegally mined ore.

The irony was that, instead of bringing the violators to book, this raid cost an official of the DPCB very dearly. He was handed a memo by the KSPCB and the company sued him for an estimated loss of 7.5-million rupees.

Local impacts

Prof. Satyanarayan, a former KSPCB member, expressed his concern, ‘The City of Bellary is simply finished. The air has become heavy due to extreme pollution from the sponge-iron plants. Earlier, we were

fighting against unregulated iron-ore mining. But now, the sponge-iron units have become a bigger menace. Black smoke, dust, increasing number of road accidents, fast-depleting green cover, and drying water sources show perhaps just the tip of an ice berg.’

On the Bangalore–Mumbai highway (National Highway no. 4), Halkundi is a village situated 10 kilometres away from the city centre. More than 13 sponge-iron units operate here, the first one not even a kilometre distant from the highway, from where a veritable sea of coal dust becomes clearly visible. Santosh Martin, an environmental activist, says, ‘Most of the land close to the plant in this village has been bought by the industrialists and put to industrial use without changing the status of land use from agriculture to industry. Excess land has been used as dumping ground for raw and waste material. Moreover, none of the plants uses the main stack to release air emissions; they all use ABC chambers (bypass pipes), which divert emissions towards the ground with the help of ID fans that diffuse the thickness of the smoke. This serves two purposes—one, it saves power and cost; and two, it helps in avoiding the use of ESPs, but pollution remains the same.’

Dr Arvind Patil, general physician and a member of a citizens group, which undertakes voluntary tree plantation programmes, remarked that the green area development record of the sponge-iron outfits had been very poor. The condition put by the KSPCB to maintain a minimum of five rows of trees both inside and outside the unit’s boundary wall is never followed seriously. ‘Regular attempts to convince these units to allow us to do tree plantations were in vain. Because they were simply not interested,’ informs Dr Patil. He explains that the health condition of workers in these industrial units is pathetic; their lungs are at high risk and, in the long run, it will have worse impact on their life expectancy.

Unregulated and excessive groundwater extraction by these sponge-iron units within the city periphery is causing shortage of water at the city, making it a matter of serious concern. Each sponge-iron unit has 3 to 5 bore wells. ‘Now, because the number of these plants increased in recent years, the groundwater table has receded; even the sponge-iron plants find it difficult to get water’ says Mr Kotresh, Deputy Environment Officer, Bellary. ‘They were getting water both through bore wells and from water tankers; but now it is becoming expensive for these units to even buy tanker water,’ he adds. The District Sponge Iron Industries Association has put forward a plan to allocate sewage water to the sponge iron units after treatment. But, the irrigation department is taking time to decide on it, as

this is one of the major sources of water allocated to agricultural fields in the district.

Kumar points out that, till recently, these plants were using power from the KPTC (Karnataka Power Transmission Corporation), besides using generators. But, after the recent guidelines from the CPCB (Central Pollution Control Board), plants with capacity of more than 200 tonnes per day are going ahead with installing their own captive power plants. The guidelines of the CPCB will only enhance their profit, because they will not only sell extra power to other industries but may also earn a lot of foreign currency by getting the status as CDM projects in spite of the fact that all captive power plants in the district are coal-based, and import coal from South Africa. He further adds, 'The whole issue is one of money and political power. We wanted these sponge-iron units to shut down on grounds of pollution and violation of environmental norms, since we have a case against every operating unit. But, political pressure is stronger than people's opinions.'

No recourse on environmental destruction

The sponge-iron industry has been identified by the MoEF (Ministry of Environment and Forests) as an extremely hazardous 'red category' industry, with high pollution impact. Despite mass protests across the country against pollution caused by the sponge-iron industry and the growing popular demand for strict pollution control norms, the government chooses to remain silent in response. In a meeting of concerned citizens with the member secretary of the CPCB held in June 2008, the CPCB accepted the fact that the owners

of sponge-iron units have behaved simply awfully in adhering to environmental and pollution norms. It is ironic that, in spite of possessing strong evidences and study reports done by various regional pollution control boards, the CPCB has not been able to tackle the sponge-iron pollution issue. Moreover, the guidelines for pollution prevention were notified only in May 2008, after a delay of three years. Above all, the notified guidelines are not the same as proposed earlier; they have rather been diluted to make them appear a mere formality and made too weak to help reign in the pollution and the ensuing disasters. Earlier, in 2006, amendments to the Environment Impact Assessment Notification had already taken away the space for public participation in the environmental clearance processes.

It is an irony that India heads the Intergovernmental Panel on Climate Change at the international level, which is committed to minimizing environmental pollution. Quite contradictory to its international position, the Government of India has been amending various environmental regulations since 2004, favouring industries that are severely detrimental to the environment. The case of unabated pollution caused by the sponge-iron industry is only one of many similar ones. Moreover, these industrial units are being callously approved as CDM projects one after another, despite the clearly visible environmental hazards they are causing on large scale (Table 1). With slack environmental norms and no strict pollution control code, India is turning a blind eye towards the ensuing human and environmental cataclysm.

Table 1: Sponge-iron CDM projects in India

State	Total projects	Status				**2020 KCO ₂	***KCER issued
		*At validation	Registered	Under review	Correction requested		
Andhra Pradesh	2	2				589	
Bihar	1		1			543	93 (1)
Chhattisgarh	31	14	17			20495	650 (9)
Goa	2	1	1		1507	43 (1)	
Gujarat	4	3			1	2078	
Jharkhand	9	6	3			17464	
Karnataka	10	7	3			18711	7022 (3)
Maharashtra	7	5	2			2529	
Orissa	29	18	8	1	2	31202	280 (3)
Tamil Nadu	4	2	2			1454	4 (1)
Uttarakhand	1					284	
West Bengal	13	8	4	1		11485	127 (1)

Source: <<http://www.cdmpipeline.org>>;
<<http://cdm.unfccc.int/index.html>>;
<<http://cdmindia.nic.in>>

* These projects are at the second stage of UNFCCC approval. Once the projects are validated by international validating agencies, these can go the non-Kyoto market (Chicago Climate Exchange, etc.) to sell their VERs or verified emission reductions.

** The total cumulative amount of CERs that the projects will collectively generate by 2020.

*** The amount of CERs or certified emissions reduction officially used. If handled by a broker of repute, these become secondary CERs and fetch the best prices. The number in parentheses denotes the number of projects that got issuance.

Rifat Mumtaz, with inputs from **Hadida Yasmin**

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Himachal Pradesh Climate Change Policy: counting on credits

The impacts of global warming the world over and its fallouts in eco-fragile areas like mountain regions and coasts are being visibly felt and understood for a long time now. In the Himalayan regions, the receding of glaciers and the increasing fluctuations in the climate cycles affecting agricultural activities and productivity – apart from the changes in flowering and seeding patterns of wild flora – are just some of the indicators that have been spoken about as local evidences of the changing global climate. Towards the end of 2008, the Department of Environment and Scientific Technologies of the Government of Himachal Pradesh brought out the *Draft Climate Change Policy 2008* for the state—a much-needed initiative at the local level in response to the global crisis. But, does the draft at all contain any response to the looming danger of global warming?

The larger picture

The fact that the excessive and large-scale burning of fossil fuels and the rapid consumption, extraction, and destruction of natural resources are the central causes behind this humongous problem called climate change has finally been, after much debate, accepted the world over. Common sense will tell us that the solution to this ‘problem’ lies in a review and radical reform of economies, societies, and lifestyles that thrive on excessive consumption and production. Common sense will, hence, dictate a paradigm shift in the existing development models, which are excessively resource-centric and polluting. Unfortunately, it is the global development politics that sets the agenda here, rather than commonsense. Since the interests of the ‘developed’ economies, for instance, the USA and Europe, the prime contributors to greenhouse gas emissions in the world because of their resource-

intensive models of economic growth, were at stake, they played an aggressive role in the pre- and post-Kyoto-Protocol period in influencing the global debate on climate change to their favour.

Till 1997/98, the effort was to derail the arguments being put forth by the environmental lobby, whereas the next phase witnessed proactive corporate involvement in the climate debate leading to what is referred to by many as the ‘corporate climate coup’. As a result, the climate-change agenda was hijacked by vested interests, by emphasizing that climate change should be dealt through ‘market-based mechanisms’ and by adopting ‘reasonable policies’. It is in this context that ‘solutions’ like carbon trading and CDM (clean development mechanism) emerged as the pillar of what is today referred to as the ‘corporate climate change agenda’. The scheme is simple: companies from high-carbon-emitting countries, in order to reduce their own carbon footprints, make investments in ‘clean’ projects in low-carbon-emitting countries. Such projects may range from growing biofuel crops to installing machinery at a chemical plant (apparently to destroy greenhouse gases) to burning methane seeping out of a coal mine or waste dump so that it does not escape to the atmosphere to building a wind power or hydro power generator. In exchange for the investment, credits are given in the form of CERs (certified emission reductions) to the investors so that they continue to emit in their respective countries. The situation is a win-win one for both the companies and countries involved, as one gets cheaper carbon offsets and the other gets an investor.

For countries like India and China, this was a convenient option, for it meant that they would not have to



compromise on their 'right to development' while dealing with the climate-change 'problem'. In no time, Indian domestic corporations – big and small – lined up to sell carbon credits and subsidize their production costs even further than already done by the Indian government, and thus maximize their profits. The 'green' image that they would get by default would be the big bonus.

By now, the NCDMA (National Clean Development Mechanism Authority) of the MoEF (Ministry of Environment and Forests) in India has approved around 1200 projects, of which more than 350 have been registered. The total investment in the carbon-credit market has crossed one-lakh-crore rupees (1000 billion rupees). Dominant amongst these projects are the energy-efficiency, biomass, and hydro power ones.

The Himalayan faux pas

And thus, the Government of Himachal Pradesh, in its pursuit of a cleaner environment, chose this very profitable route—the carbon market. The *Draft Climate Change Policy 2008*, which has been submitted to the NCDMA, has one single focus: to facilitate implementation of the CDM for private companies building hydropower and other industrial projects in the state. By 2007, the NCDMA had cleared 102 hydro power projects for CDM, because run-of-the-river projects are considered to provide an environmentally cleaner option of generating electricity as compared to, say, thermal power. Many of these being located in Himachal Pradesh, the state has become the abode for hydropower generation. Unfortunately, the real environmental and social impacts of hydropower projects, though often highlighted, have been largely ignored.

A visit to a hydro project site provides ample visible evidence of the devastation caused. Landslides, soil erosion, and flooding as results of dynamiting, cutting through the mountains, and dumping of solid debris are the commonest of problems. Diversion of rivers and streams has already severely affected the water flows, which were crucial not just to the river fauna but to scores of communities along the valley dependent on the streams for irrigation, drinking, fishing, or running of watermills. Local communities around project sites tell horrific stories about the loss of agriculture and destruction of forests and pastures along hill slides—all intrinsic parts of their livelihoods. Moreover, far from being beneficial to the environment, for which they enjoy the CDM status and thereby reap financial benefits, these projects contribute to further destruction of it. Environmental norms and regulations are openly flouted without the companies ever being brought to book.

The most blatant example of such violations in Himachal Pradesh is the 1000-MW Karcham Wangtoo Hydro Power Project in Kinnaur district, being developed by the Jaypee group. The project has met staunch opposition from people of the affected panchayats. The Sutlej river, on which the project is being built, has already been facing high siltation and floods leading to destruction in the entire valley. The project has received the CDM approval despite all the concerns raised and reported.

A similar story goes with the 192-MW Allain Duhangan Hydro Power on the Beas River, funded by the World Bank. The CDM application for this project states that the World Bank financed it only in expectation of CDM income, expected to be around 315-crore (3.15 billion) rupees. The project has already spelt doom for Preeni and Jagat Sukh villages of the Kullu Valley. Apart from the much-needed irrigation water for the apple orchards being diverted, almost 10 hectares of forest land with oak and cedar trees has been de-notified for the project.

The devastation caused by both the Karcham Wangtoo and Allain Duhangan projects, however, has invited public interest litigations filed in the High Court of Himachal Pradesh.

More than the large hydro projects, it is the smaller ones that are now trying to attract CDM funding. Akshay Jasrotia, a Zilla Parishad member in Kangra, who is at the forefront of the movement against the CDM-approved Binwa Phase II Hydro Project on a tributary of the Beas River, says, 'It is the subsidies which attract the small players into these projects. On the one hand, the Ministry of Non-Conventional Energy of the Government of India, with funding from the Global Environment Facility, is subsidizing up to 40 per cent on the cost of each of these projects, and, on the other, many of these are going in for the CDM under which they gain large subsidies for saving carbon emissions. While the total cost of setting up a 1-MW project stands at around 3 to 5-crore rupees, the returns are massive at around 60,000 rupees a day. If we take into account the subsidies, the profit margins are huge.'

It is rather shocking and ironic that the Himachal Pradesh Government, instead of addressing these issues in the draft policy, is looking at assisting private companies in green washing the real impacts of these projects through the CDM. Notwithstanding the problems with the hydro sector, the draft policy goes on to include this and other energy-consuming and environmentally destructive sectors like cement and potential sectors that could benefit from the CDM regime. The content of the draft policy for most part is insubstantial—merely a cut-and-paste job of the causes

and effects of climate change as stated in most documents. What perhaps is dangerous is the vision and perspectives behind the policy, which is not stated in the draft but leaps out from it—to attract large funding in the name of tackling climate change. On top of all this, the chief minister, P K Dhumal, who demanded a compensation of 1000-crore rupees annually from the Government of India in lieu of the carbon credits earned as per the Kyoto Protocol, also bagged the Golden

Peacock Award for 2008 for ‘environmental leadership’. Climate speak may draw awards, but sooner or later the people of Himachal Pradesh will want to know whether it will protect their environment or destroy it?

Manshi Asher

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The Bhilangana Dam on troubled waters

‘It’s a lie, we don’t want this dam! No, no!’

— a community resident near the Bhilangana Dam in Uttarakhand

Run-of-the-river dams have been promoted as renewable energy projects with promised social and ecological benefits under the CDM regime; but a closer examination of the real impacts of some of these projects gives little evidence for this being the case.

The Swasti power project

The SPEL (Swasti Power Engineering Ltd) got the CDM approval in early 2007 to develop a 22.5-MW hydropower project on the Bhilangana River in the Himalayan state of Uttarakhand. This run-of-the-river hydroelectric project aims to harness the perennial waters of the Bhilangana River—a major tributary of the sacred River Bhagirathi. The company stands to make enormous profits as the project is registered to generate a large sum of carbon credits—624 000 CERs within 2012 and 1 093 000 CERs within 2020, meaning, in monetary terms, anything between 8 to 15 million euros! On the flip side, ACRES International, a US company, is part-owner of the SPEL and was convicted for corruption charges in 2002 and black-listed by the World Bank.

The survey for the dam project was conducted over ten years ago. The survey report, which was prepared without any consultation with the local communities, said that there were no villages near the project and that villagers upstream of the river had no need of river water because their agriculture was dependent on only rain water.

The ground reality

Just a 10-minute walk from the dam works lies Village Sarona on the Bhilangana River. The community sustains itself from growing rice, wheat, mustard, fruits,

and vegetables on the village commons through community farming. The terraced fields are irrigated in a traditional way by capturing water from the river through small water channels built into the earth. The 80-odd families that inhabit this picturesque village were never consulted about the project, which is going to devastate them, by the government or by the SPEL.

In 2003, when the machines arrived to start the construction of the dam only did the community come to know about such a project being planned right in their backyard. The older women in the village were the first to decide to do something about the impending danger to the village. The strategy was to block the machines from working. One villager stated, ‘We did not put sand in the petrol tanks; we are non-violent; we want an honest fight.’ But, that did not stop the state to unleash violence on the peaceful resistance of the people. Police forces were sent and many villagers were put behind bars. By March 2007, villagers had been jailed on three separate occasions.

The villagers’ main objection to the project is that the power project is accessing and taking control of the river water before it could come into their irrigation channels, which is severely affecting agriculture in the Bhilangana valley.

In March 2005, 120 villagers were arrested and put in jail for four days; 79 more, including women, were arrested in July 2005. In November 2006, at least 29 people were arrested and forced to sign a document that they would stop their resistance. One village woman stated, ‘Our children were in school when they took us all to jail. I was so worried for the children being alone for so long with no adults around them; but the older children took care of the younger ones and they made food together.’ Since then, the PAC (Police Armed Constabulary) has raided the village two times using



brutal force in which people had their clothes torn off and beaten; women assaulted, dragged by their hair, and tortured.

In 2005, the Asian Human Rights Commission appealed for urgent action, in which it was mentioned that there are three dam projects on the Bhilangana River and 146 in the State of Uttarakhand. The villagers continue to be harassed and their traditional irrigation systems damaged, and the dam work continues. All this while no villager seems to be even aware about what does CDM or carbon trading mean!

Green finance, at what cost?

The emerging global carbon offset market has created a lucrative new commodity while essentially distracting from the real and difficult steps needed to avert the climate crisis. In hundreds of locations around the world, polluting private companies are building up new profit centres to capture green finance. These carbon projects are subsidizing some of the most polluting companies in the world.

The reality of these projects is startling. Even renewable projects that look the best at the outset are rife with conflicts. A brief look at market fundamentals suggests why such conflicts are almost inevitable. The most reliable providers of offset credits will inevitably be big, highly-capitalized firms or agencies in a position to hire carbon consultants and accountants, liaise with officials, or pay the fees needed for UN registration.

These projects are not set up to deal with the real complexities and intricacies of communities and livelihoods. They require enormous quantities of resources in terms of land, water, and machinery and do not benefit the local communities or ecology. They generally take place in regions where people have little political power, engendering a deeper North–South divide.

Tamra Gilbertson

(Tamra Gilbertson is a researcher-activist associated with Durban Coalition for Climate Justice and Carbon Trade Watch)

The ABC of how to torment Asia's rural poor

Atmospheric brown cloud and its projected impacts

Over the last decade or so, in the middle of the intense dialogues on climate justice and the intricate wheeling-dealings between nation-states, large corporations, NGOs, international funders, and multi-lateral agencies, a new spin has been added to the debate. This is the issue of black carbon or, more precisely, ABC (atmospheric brown cloud, earlier called the Asian brown cloud), which is now 'discovered' to be having such a large impact on the climate and glaciers that it is considered almost as important as the climate-changing global CO₂ (carbon dioxide) emissions from the burning of fossil-carbon fuels (coal; petroleum products like petrol, diesel, kerosene, etc.; and natural gas). The year 2002 saw this issue come into international focus, whereas 2008 saw the 'study' focusing on its Asian sources and impacts.

In short, it was 'discovered' that the large number of poor families in Asia burning wood and other biomass for their daily cooking, etc., are emitting large quantities of dark soot or black-carbon particles, which are forming a sort of brown cloud in the atmosphere. This dark coloured 'cloud' is said to be 'absorbing a large amount of in-coming solar heat, thus increasing the temperature of the lower atmosphere' of the earth. Another harmful impact of the black carbon was found

to be the 'increased rate of melting of Himalayan glaciers', as these dark black-carbon particles travel to the Himalayas and settle down on the 'white' glaciers, thus decreasing their 'albedo' or reflectivity. This increases the heat absorption by the darker glacial surface and, consequently, its melting rate. The Indian summer monsoon is also supposed to have been affected by this ABC, by changing the heating difference between different areas of India's landmass. The black carbon or soot is also a major 'health threat' for the poor families who use biomass as fuel in their 'improper' *chulhas* or biomass stoves.

And the urgency of tackling global-warming-induced climate change demands that this heat-trapping ABC be reduced, largely by addressing the 'problem' of biomass burning by the large number of poor families, mostly in Asia!! So now, the industrialized world, who are supposed to be not contributing anything to this 'dangerous' ABC, has another stick to beat the poorer developing countries in Asia, after the collapse of the 'cattle-produced methane' beating-stick. They are basically now asking Asia's biomass-burning poor to vacate the atmospheric pollution space for their 'way of life' of individual cars, big houses, lit-up shopping malls, frequent flying, and so on!!

Genesis of the problem of ABC

The worldwide engagement on the global warming / climate change issues at various levels has been primarily focusing on the so-called GHG (greenhouse gases), and with very good reasons. The industrialized countries have extracted and burned an overwhelmingly large proportion of the total cumulative fossil-carbon fuels over the last couple of centuries. The 'waste products' of burning fossil-carbon fuels – mainly CO₂ – have been dumped by these nations in the global common atmosphere, without any care or concern over their implications.

As the total dumping every year is far above the CO₂-recycling capacity of the earth's atmosphere-hydrosphere-biosphere-lithosphere systems, the 'excess' has been building up in the atmosphere and has pushed up the CO₂ concentration in it from around 280 PPMV (parts per million by volume) during early industrial period to 388 PPMV at present. Over the past couple of centuries, the 'developed' industrialized countries have contributed to nearly 90% of this CO₂ build-up. CO₂ being a GHG, this increased concentration in the atmosphere is absorbing an increasing amount of the low-energy heat radiation going out from the mildly-warm earth's surface, thus increasing the temperature of the lower atmosphere and the surface. This has disturbed many a set and balanced climate system on the earth, which are critically dependent on surface temperatures and temperature differences, causing unpredicted variations in the climate and inflicting untold miseries to the poorer population dependent on natural resources and natural climate cycles.

Logically, all efforts should go towards reducing the emission of these GHGs, bringing them down to the levels that the earth's carbon cycle can handle. The most direct and logical implication of this should have been a drastic reduction in the consumption of fossil-carbon fuels. The Kyoto protocol and subsequent processes were expected to precisely address that, putting pressure on the over-consuming industrialized nations to cut fossil-carbon energy use by large margins. Any just action would also require that the world's majority of forced under-consumers – who are denied even subsistence level energy and other consumables – be provided with enough to lead a dignified life.

In refusing to carry out any such reduction in their aggressive over-consumption and, consequently, excessive waste dumping into the global commons (like the oceans, the atmosphere, etc.), the capitalist-industrial societies have consistently tried to pass the burden of consumption-reduction to the already under-

consuming societies. This has been done through shrewd market-based mechanisms like the carbon trading—CDM (clean development mechanism) and the like. Now, one more potent weapon has been discovered in the form of ABC; multi-lateral agencies along with the western research institutes gleefully accepted the new-found opportunity.

The projected facts

Many agencies and individuals – the IPCC (Intergovernmental Panel on Climate Change), well-known climate scientists like Hansen and Jacobson, and the 2008 UNEP (United Nations Environment Programme) study – have tried to quantify the amount of global warming potential – called radiative forcing – of ABC. There are wide variations in these calculations (from 0.2 watts/m² to over 1 watts/m², or a factor of 5!). The UNEP study lead by one Prof. Ramanathan 'shows' the highest amount by far of contribution by ABC to warming, by taking into account the effect of glacial snow-melting caused by black carbons settling down on Himalayan glaciers.

The Himalayas on the Tibetan side are said to have warmed by over one degree Celsius over the last century or longer – significantly higher than northern Indian plains – and the glaciers over there are supposed to be melting even faster. There are said to be 'hotspots' of this brown cloud, one of the prominent being the 'Indo-Asian-Pacific Plume' where one can 'see' the brown cloud rising, in satellite images. In the 'HinduKush-Tibetan-Himalaya' region, warming by the black-carbon factor is now said to be almost equal to the warming by the additional CO₂ in the atmosphere!

As an additional impact, the health cost to the poor families using biomass stoves is also highlighted.

Concerns, doubts, and contradictions

No doubt that a majority of Asia's poor households burns a large quantity of wood and other biomass everyday for cooking, the soot from which is expected to rise to the atmosphere by the heat-created updraft. But, similar is the case, in a larger scale, from the umpteen incidences of forest fires in California, Australia, Russia, Mongolia, and other places around the world. Several such forest fires in California (USA) and Australia regularly burn down hundreds of square kilometres each, thus sending up enormous quantities of black carbons or dark soot into the atmosphere, year after year. A satellite image of such large-scale plumes emanating from forest fires in Russia and China in April 2009 is shown in Figure 1.

Why do the UNEP or Prof. Ramanathan not show any concern for the dark plumes emanating from the forests



of industrialized countries? With all their ‘advanced’ technology and economic resources, it should be far easier for these governments to control and even eliminate most of these fires. Just one such large fire in California burned down nearly 1800 km² of forests at one go, sending as much dark soot to form brown clouds as not even a hundred million poor families could do in course of their daily cooking. And, there are no such compulsions associated with these huge forest fires as with daily cooking by the poor Asian families.

There are also large number of industries and thermal power plants in northern India burning millions of tonnes of coal and oil and emitting hundreds of thousands of tonnes of dark suspended particulates into the atmosphere every year. Just in Delhi-NCR (National Capital Region), which includes peripheral towns such as Gurgaon, Noida, Faridabad, Ghaziabad, etc., there are over 1.5-million cars consuming many million tonnes of petrol and diesel, and emitting hundreds of thousands of tonnes of dark soot each year. Does not this travel to the Himalayas and get deposited on the glaciers? Or, only the soot from the poor’s kitchen has that bad habit?

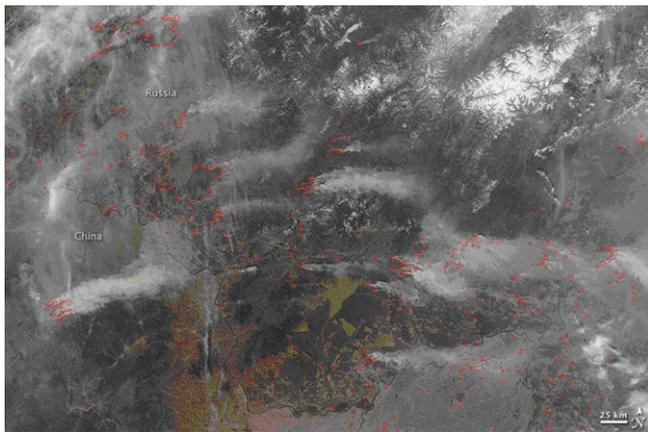


Figure 1:

Satellite image of large-scale plumes emanating from forest fires in Russia and China, April 2009

Out of more than 140 000 MW (megawatt) of installed electricity generation capacity in India, about 90 000 MW or more is coal-fired. These coal-fired units consume about 300-million tonnes of coal each year, generating over 90-million tonnes of ash, a significant part of which flies off to the atmosphere as fine dark particulates. Does anyone show any concern about how these tens of millions of tonnes of fine dark particles add to the warming of the northern Indian mountains, or how much they contribute to the Himalayan glacier melting? Probably not, because the electricity thus generated is consumed mostly by the influential upper and middle

classes in India. The 1.5-million cars in Delhi-NCR must be contributing a much larger dark soot component than the millions of family kitchens, but no state wants to confront or challenge the dominating ruling classes and their emission-intensive consumption. This is the precise reason that the media also selectively picked up the black carbon from the poor families’ kitchens as a big problem.

Another carefully hidden fact is that the atmospheric life of black carbons generated from kitchen fires ranges from a few days (during periods of high humidity/precipitation) to few weeks at the most, while that of the fine dark particles generated by power plants, cars, industries, etc., stay much longer, and the atmospheric life of CO₂ is measured in hundreds of years. Then, what should we target, for achieving greater reduction impact?

Moreover, if one takes the luxury consumption of China’s middle and upper classes (Tibetan Himalayan glaciers also get black carbons from these emissions), India’s contribution ‘shrinks’ in comparison.

It is reliably estimated that about 70% of Indian households still use biomass (including wood, coal, briquettes, dry leaves and grass, cow-dung cakes, etc.) as cooking fuel, because these are the only ‘affordable’ and somewhat accessible options. The ‘great dream’ of the Indian State – of providing ‘clean LPG’ to every family – is now clearly impossible and undesirable as well, considering the inevitable peak-oil and gas (the time when production of these fossil-carbon fuels will attain a peak level and then decline rapidly) drawing near, and also from the perspective of dispossessing the rural and forest-dwelling poor from their self-accessible fuel source, and forcing them into the cooking-fuel market.

There is no doubt that the families – particularly the women and younger children staying close to their mothers – are badly affected by the high levels of particulate pollution created by the burning of these biomass fuels, in pollution-belching stoves. One fairly large sample study in Orissa villages showed that the average SPM (suspended particulate matter) pollution inside such kitchens were as high as 1500 to 1800 microgram/m³ of air, which is frighteningly higher than the prescribed safe levels in case of long hours of exposure. Thus, the need to provide these families with something much less polluting and health-impacting is obvious. The problem arises when there are attempts to link their needs with the market. Once they are tied up with the carbon-trading-type market mechanisms, the vulnerable poor families will be subjected to all kinds of exploitations and forced dispossession by the powerful

trading entities and the coterie of their 'skilful' technical consultants, operators, verifiers, certifiers, and the like. There are already market initiatives to launch special kinds of stoves, which will supposedly reduce dark particle emission in the poor kitchens. It is just a matter of time for the stoves to come as a part of a CDM package.

The state has the responsibility to provide its poor with reasonable levels of life-means, and it cannot be allowed to wriggle out of this by giving primacy to commercial and trading interests. Easy access to cooking fuel that do

not slowly kill you by poisoning the air you breath should be part of the fundamental rights of every citizen of this planet, and there is no place for 'trading' this right. What we need to understand clearly here is what precise designs lurk behind these periodic 'scientific discoveries' and targeted media campaigns, and also how to analyse and challenge these malicious attempts to further privatize the atmospheric global commons

Soumya Dutta

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A few random observations on the IPCC Briefing Paper on the Brown cloud issue.

The issue perhaps is not the science of Black Carbon, but the notion that this black carbon problem can be 'fixed' by giving new stoves with better technology to people who live in mud huts; and hence, hey presto, the glaciers no longer melt, magically!

There is no doubt that traditional fuels used in the traditional ways can cause health problems for the users. But then, wood and biomass burning are not limited to the 'poor', rather this is how the majority of Indian households in the rural areas generate their everyday energy, rich and poor alike; while in the urban areas the poor also burn whatever they get...to cook, to heat...everybody in India has seen people burning plastic and rubber during the winters.

Talking of health, who cares a straw for people's health in India? In areas without any health-care facilities and even the most rudimentary kind of access to any medical service worth the name, can you improve people's health just by introducing a new kind of stove? And talking of stoves, there are many cases of such stoves being distributed among forest 'fringe' communities in many places, most of which did not work after a few days, or did not work at all. Worse, people simply did not want those new 'toys', call it inhibition, whatever.

However, coming back to global warming and glacial melt, the IPCC 2008 briefing paper on Black Carbon quotes studies that say biomass burning and household use of fossil fuel are among many sources of BC...and a few studies from India and elsewhere even quantify the sources for BC Emission. According to these, 18 percent of the global BC emissions come from residential usage. The briefing paper goes on to say that improved stoves can reduce 70-80 percent of the Emission in South Asia!

One wonders how these figures are found. So far as one knows there is no dependable and comprehensive study which measured and quantified residential fuel usage in the rural areas of India, let alone South Asia. One wonders how the studies quoted in the Briefing paper got their figures, what sort of samples were used, which variables were taken into account, and for how

long...figures in themselves mean nothing because fuel usage is not something which can be calculated just by using easy mathematics. The variables are so numerous and diverse that perfect figures are hard to obtain, if not impossible!

To estimate soot/BC emitted by the poor of India, it is first necessary to quantify how much fuelwood/other biomass/coal/kerosene the 'Indian poor' burn annually. To know that one has to sample the 'Indian poor' spread over a perfectly infinite number of social, cultural, economic, ecological and geographic locations, over a reasonable period of time, and study those samples, to start with. Has this ever been done? One fails to understand how otherwise the confident and firm emission figures the studies and the IPCC paper are full of are obtainable.

The briefing paper is full of such wonders. It prescribes a ban on slash-and-burn, and seasonal burning in agricultural fields, once again to regulate BC. The meaning of such science leaps even to the unscientific eye. A ban on slash-and-burn is REDD, in a different garb. To say assertively and scientifically that traditional systems of life in the Global South need to be regulated in order to prevent global warming is another way of passing the buck which the REDD wants to do.

Because, at the end it is not what causes the glaciers to melt that is important. The important thing is to stop the glaciers from melting further. And because it is not possible to stop the necessary Co2 Emissions from both the developed North and the Developing South, without hurting the corporate and the consumer interests, it is always safer to go back to the poor in India or other 'developing' countries, talk of mitigation funds, and giving the poor new stoves etc. And every time, call it science, the best that is available. That way, it is beyond the reach of mortals like us.

Isn't it time that we start getting sceptical about science? And fixes, all kinds of fixes? When will we learn that nature can not be 'fixed' and human societies can not be quantified? When will we cease mouthing and believing beautiful, scientific lies?

Soumitra Ghosh

THE CDM SCAM

Case study on Jindal CDM projects in Karnataka

Location

The JSW Energy Ltd is located adjacent to its parent concern, the JSW Steel Ltd, two kilometres from Torangallu village of Bellary district in Karnataka. The plant site situated between Bellary and Hospet falls on the state highway connecting Bellary and Sandur.

What the PDD says

Project overview

JSW Energy has been commissioned to generate electricity using imported coal and waste gas. The electricity generated is supplied to JSW and the Karnataka state grid—the KPTCL (Karnataka Power Transmission Corporation Limited). The input fuel to the JSW Energy power plant is sourced from JSW Steel, which is generating corex gas and other waste gases from its process and sourcing imported coal. The project is supposed to reduce GHG emission by increasing the proportion of waste gas in the fuel configuration for power generation.

During the initial operation period, the project faced uncertainties about the availability and steadiness of supply of the corex gas and other waste gases from JSW. Because of these, JSW Energy dropped the plan of utilizing waste gases, and had accordingly applied for and obtained the requisite approval from the KSPCB (Karnataka State Pollution Control Board) to combust coal exclusively. Subsequently, during March 2001, JSW Energy management decided to go for the current project activity so that the use of waste gas is maximized in the fuel configuration and emission of GHG is reduced. This decision has seriously internalized the potential benefits of CDM. Besides the potential CDM benefits, there is no other incentive for JSW Energy to maximize the use of waste gases for power generation.

The project activity involved additional investments to the tune of 240-million rupees (to the investment in power generation using coal) to achieve a steady supply of the waste gas.

The JSW Steel Ltd has also a CDM project operational, that is, generation of electricity through combustion of waste gases from the blast furnace and corex units at its steel plant (in JPL unit 1) at Torangallu in Karnataka. With the advent of the separate JSW Energy, the total amount of corex gas supplied to by the JSW Steel Ltd and the JSW Energy Ltd is metered separately. Also, the JSW Steel Ltd and the JSW Energy Ltd are two separate legal entities.

Sustainable development

The PDD of JSW Energy highlights the company's contention that they have satisfied all the four indicators for sustainable development – social, economic, environmental, and technological well-being – as stipulated by the MoEF (Ministry of Environment and Forests), Government of India, in the interim approval guidelines for CDM projects.

Social well-being

- The project demonstrates harnessing power from waste gas sources, which will encourage replication of such project in future across the region.
- The project has built up a knowledge base about the operation of the waste-gas-based power generation and has built up a skill set for such kind of operation.

Environmental well-being

- The project activity involves generation of electricity using waste gas, thus replacing a certain amount of fossil fuel used for electricity generation. This has resulted in reduced GHG intensity per unit of electricity generation for the state grid; and, in effect, the total carbon intensity of the Karnataka state has been reduced.
- The project has reduced the local air pollutants and environmental impacts due to increased share in the use of waste gas in the fuel configuration.

Economic well-being

This project will demonstrate the use of new financial mechanism – that is, CDM – in raising finance for power generation from waste gases.

What the field study reveals

A visit to Toranagallu village and discussions with some panchayat office bearers and villagers – Mr Shankar, who is a bill collector at the gram panchayat; Mr Govind, a gram panchayat member; Mr Shivkumar, gram panchayat member; and many other members – revealed that though the JSW Energy Ltd is a very big industry, established on an area covering 250 acres of land, the area is not declared as an industrial area by the government. The main products in this industrial set-up are steel and iron, where production of energy constitutes only a small proportion. JSW has got the land from the government at a throw-away price of 10 000 to 15 000 rupees per acre.

The company, before starting the project, had promised that they would adopt the entire area for all-round development and provide all kinds of civic amenities. However, after acquiring people's lands, the company did not do a single social or developmental activity, and neither do they have any plans for doing so. They blatantly backed out on all their commitments about electricity supply, road construction, health facilities, employment benefits, and so on. The JSW Energy has only constructed a few bus-stop sheds and two roads, which are mainly used by the company.

Very few local people are engaged in the company as workers; most workers are from distant areas and even from other states. The village population is 8000; but with the number of people coming from other areas to work in the plants, the population touches 80 000. All the workers are contract labourers who are not allowed to work here for more than 2/3 years. Anyone who dares raise any question against the company's work ethics does not get further work.

The plant is indiscriminately releasing toxic waste water into the canal that passes through the village, not only polluting the canal water but also the village pond (which is linked to the canal) and the groundwater. Even the water collected from tube wells is found to be toxic. Besides harming farm produce and activities, water pollution by the industry has made it difficult for the villagers to access safe drinking water and has given rise to incidences of several water-borne diseases in the village. On the other hand, unabated air pollution from the industry has compounded the problems for the local populace. Diseases, such as skin ailments, asthma, and tuberculosis, which were not prevalent in the area, are now common.

The company has also turned back on improving health services in the area. The local government health centre is in a dismal condition, depriving villagers of the requisite health services. However, the JSW Energy has opened a modern hospital named *Sanjeevani*, which only caters to its employees and discourages the local villagers to avail its health facilities by forcing them to pay unaffordable fees. Therefore, people have demanded that the JSW Energy develop the existing health centre, to which the company did not pay any heed.

JSW has also illegally occupied the 600-acre village commons where there were plans of constructing schools, college, and an ITI (industrial training institute).

The villagers complained that before starting a new unit or project, JSW never even bothers to get the consent of

the villagers. They call only a few panchayat members for a meeting and bribe them with good food and sweets, and then take several photographs so that a fabricated story about people's consent can be published in the newspapers.

The CDM hoax

Sustainability criteria

The field study clearly suggests that all the indicators of a CDM project have been grossly violated by the JSW Energy in the Torangallu region. No initiative on sustainable development of the region has been taken up by the company, and nor have the local people been involved in any decision-making or project activities. The PDD claims that the project has built up a knowledge base about the operation of the waste-gas-based power generation and has built up a skill-set for such kind of operation. However, there has been no such initiative to even make people aware about a waste-gas-based power system, let alone building any skill-set for such kind of operation.

The economic development promised in the PDD has also turned out to be a hoax, as most people are now rendered unemployed after losing their land to the project.

In terms of environmental well-being of the region, the project has been an unmitigated disaster from the beginning. Instead of cleaning up the air and the atmosphere, it literally damned the local populace and their environment with unprecedented air, water, and sound pollution, which, in turn, brought a host of strange diseases to the village.

JSW Energy has even made no attempts to make people aware about the CDM component of the project, such as GHG emissions, clean mechanism, carbon trading, or even global warming. However, they have claimed in the PDD that the local people have a direct hand in the reduction of GHG emissions in the project and thereby contributing to the mitigation of climate crisis.

Additionality

In case of the Jindal projects, the CDM fraud goes deeper than violations of the sustainability criteria.

Every new CDM project has to prove its 'additionality', which means that the project would not have been possible without the CDM benefits—monetary and otherwise. The additionality of the Jindal waste gas projects in Karnataka has been suspect from the very beginning; among others, the noted carbon market expert Dr Axel Michaelowa called the projects 'clearly non-additional', because the projects could have come

up irrespective of the CDM money.

Dr Michaelowa's submitted a public comment challenging the project developers' claim regarding the timing of when the plant was going to use waste gas for electricity generation: essentially showing that this decision had been made long before the company had applied for CDM funding, and that it, therefore, failed the additionality test, that is, the JTPCL had already decided (and had an incentive) to implement it without the CDM. Dr Michaelowa writes:

*I made a public comment on the first project questioning its additionality. In my view, these projects could become a key precedent for allowing large non-additional energy-efficiency projects into the CDM. My comment read as follows: 'This project is non-additional. Its claim that a decision to use waste gases to generate electricity was made at a later stage than the actual investment [was done] into the corex plant is not true. Electricity generation from corex gases was always a key element of the project investment (this is a well known fact in India) and thus the assertion that during March 2001, the JTPCL management took the decision for the current project activity is blatantly wrong. Moreover, the first tranche (130 MW) of the project started production well before 2000 and thus that tranche is not eligible for the CDM. See the publication (which does not mention the CDM at all and is another indicator that CDM was not seriously considered!) by the project participants—Dwijendra Ghorai, Friedrich Bräuer, Helmut Freydorfer, Dieter Siuka, **L'unité COREX® chez Jindal Vijayanagar Steel : une réussite sur toute la ligne**, Rev. Met. Paris, N°3 (March 2001), p. 239-250; (English version, **COREX operation at Jindal Steel: a success story in Millennium Steel**, 2001, p. 20-25.'*

It has also been alleged that there has been a price fix for the electricity being generated: one arm of the Jindal group is charging another arm of the company a higher price for the electricity it generates under the CDM than normal, so as not to make the waste heat plant financially attractive without the CDM.

These and other questions about the Jindal projects' additionality and CDM norm violations were raised in the course of a Channel-4 programme in early 2007.

Windfall profits

The extremely serious objections to the 'CDM'ness of the projects, however, went unheeded. The Jindal group went on reaping enormous profits from the projects (Dr

Michaelowa said during an interview with Channel 4 that the projects can gross up to 20 million euros annually by selling CERs). One has to remember that this is an early 2007 estimate when the average price of a secondary CER (CERs issued by the UNFCCC and coming from a project that is handled by a reputed broker) was about 15 euros, and the CDM market touched its zenith of 27 euros/CER in July–August 2008, before the recession effects started to be visible. The two CDM Jindal projects in Karnataka have been issued 7 843 000 CERs so far (till 26 August 2009). Because of all Indian companies' typical habit of holding on to their CERs (for fetching better price at a later date), it is difficult to assume exactly how much money a particular project has earned.

Jindals admitted to have earned, till late 2007, 1.1-billion rupees (it could be much more) from selling supposedly 'reduced emissions' (1.3-million CERs) at their steel plant in Karnataka. According to company sources, this boosted other incomes, and helped the Jindal Steel Works to record their best ever quarter in terms of profit¹. If we consider the present issued-CER figures, the total earning from their 'profitable' clean projects can be anything between 100 and 150-billion rupees! According to another estimate², at the current market price of 15.5 euros per CER in early 2007, the company stood to gain 109-million euros over a 10-year period from the sale of CERs; and interestingly enough, JSW Steel is expected to 'save' on an average 0.77-million CERs per annum that can be sold in the open market, which means that the company would hold on to its CERs in wait of even bigger 'profit'!

The Jindals have 9 CDM projects in their kitty, only 3 of which have a collective potential of generating no less than 24 378 000 CERs by 2020. These are all located in the JSW area at Torongulu. One of these (the biggest, with 8 589 000 credits) has not been registered with UNFCCC yet.

Nishant, with inputs from Soumitra Ghosh

(Nishant Mate is a social activist and researcher associated with National Forum of Forest People and Forest Workers. Soumitra Ghosh is a social activist and researcher associated with National Forum of Forest People and Forest Workers and NESPON)

¹<<http://news.moneycontrol.com/india/news/stockmarket/marketnews/20/47/19>>

²<<http://www.capitalmarket.com/Cmedit/story2-0.asp?SNo=152283>>

THE CDM SCAM

Wind power projects in Karnataka

The NSL Wind Power Project

Location

The NSL (Nuziveedu Seeds Ltd) has set up a 27.65-MW-capacity wind farm project at Jagalur (Guheshwaragudda–Bidrakere ridge) in the district of Davangere in Karnataka. Davangere is about 240 km from Bangalore, the state capital.

What the PDD says

Project overview

The NSL, with its headquarters in Hyderabad, Andhra Pradesh, is a leading hybrid seeds business. The present project is supposed to promote green power, by tapping the wind energy available in the ‘barren land’ of Karnataka, which is deficit in power and peak energy requirements. The project is registered with the UNFCCC as a CDM project. This 27.65-MW project is one of the biggest of its kind in the area. The NSL’s efforts in wind-energy sector have been recognized and honoured by the Department of Energy, Government of Karnataka, with an award citing *highest investment made in establishing wind farms in individual capacity*.

The project is capable of generating around 82-million units of electricity per year, if the mills are operated with around 30% utilization factor through adoption of efficient and modern technology. Power from the NSL Wind Power Project will be sold to the KSEB (Karnataka State Electricity Board). The 27.65-MW project comprises 29 WEGs (wind-energy generators) of capacities ranging between 0.75 and 1.5 MW. The project activity has been planned and executed in three stages, with capacities of 12 MW, 6.65 MW and 9 MW, respectively.

Sustainable development

The project primarily assists the state of Karnataka in particular and India in general in stimulating and accelerating the commercialization of grid connected renewable energy technologies. In addition, wind power projects like this demonstrates the viability of grid-connected wind farms, which improve energy security, air quality, and local livelihoods, besides assisting the development of a domestic sustainable renewable energy industry. The specific goals of the project are as follows.

- Operationalizing sustainable development through generation of eco-friendly power

- Increasing the share of renewable energy power generation in the regional and national grid
- Bridging India’s energy deficit in the business-as-usual scenario
- Providing national energy security, especially when global fossil-fuel reserves threaten the long-term sustainability of the Indian economy
- Strengthening India’s rural electrification coverage
- Essentially reducing GHG emissions compared to business-as-usual scenario
- Reducing pollutants, such as sulphur oxides, nitrogen oxides, particulate matters, etc., resulting from other power generation industry
- Contributing towards addressing power shortage especially in the state of Karnataka
- Demonstrating and helping in stimulating the growth of the wind power industry in India
- Enhancing local employment in the vicinity of the project, which is a rural area
- Building capacity of and empowering vulnerable sections of rural communities dwelling in the project area
- Ensuring energy security for future generations by generating power from renewable resources
- Conserving natural resources, including land, forests, minerals, water, and the ecosystems

What the field study reveals

It was found during the field visit to the Jagalur region that there are seven villages around the NSL Wind Power Project—Bidrakere, Nimbore, Biderekere Valeddy, Nimbare-Valreddy, Markunte, Markunte Golreddy, and Dambolli. Gram panchayat member Martheshwar Reddy and staff member Gopi informed that people in the Nimbore and Biderekere villages have lost both village land and forest land to the wind energy project; but no one has got any payment for the land thus lost.

The company has not even sought any ‘no-objection’ certificate from the gram panchayat for using the village land for the project. Prior to the commencement of the project, neither was any meeting convened by the company to seek the consent of the people nor was any



information provided to the villagers about the wind mill project.

The CDM hoax

The PDD of this CDM project claims to be enhancing local employment in its vicinity, which is a rural area. But, no villager has got any employment in the project and nor is anyone involved in any way with the project activities.

The responsibility of the company (as highlighted in the PDD) towards conserving the local ecology and natural resources including land, forest, minerals, water, and ecosystems, remains a hollow promise. In the first place, this wind power project occupies large areas of forest and agricultural lands, creating imbalance in the local ecology. Secondly, noise from the wind mills not only makes it difficult for the local residents to lead a normal life, it also has affected the movement of wild animals in the vicinity.

The PDD glorifies the local people as stakeholders in this CDM project, while the company did not even bother to inform the villagers about the project and its activities. The company also claimed to run programmes for the capacity-building and empowerment of vulnerable sections of the local rural community; but, in a blatant act of violating the stipulated CDM norms, the company has not even held a meeting involving the local populace. So, while the company showcases that the local people play a big role in mitigating the climate crisis by directly participating in its CDM project, people are not even aware about the nature and objectives of a CDM project and concepts such as carbon trading and emission cuts.

The company, however, keeps on making huge profits from the project while the socio-economic situation of the local communities has worsened.

The MSPL wind power projects

Location

The MSPL Ltd, part of the Baldota Group, owns three wind power projects, located at Sogi, Jogimatti, and Jajikalgudda in the districts of Bellary, Chitradurga, and Davangere, respectively, in Karnataka. Bellary, Chitradurga, and Davangere are at 300, 200, and 317 kilometres from the capital city of Bangalore.

What the PDD says

Project overview

The MSPL, with a view of being in line with the sustainable development priorities of India, is promoting project activities to generate sizable volume of green power by tapping wind energy in the 'barren' land of Karnataka, deficit in energy and peaking power.

The project proposes to generate 125.15 MW equivalent of clean electricity with efficient utilization of the available wind energy through adoption of efficient and modern technology. The project will replace energy produced through combustion of fossil fuels with equivalent volume of clean energy. Green power of 303.3 million units per annum will be fed to the KPTCL grid, a part of the southern regional grid.

The project involves three concerns of the Baldota Group—the MSPL Ltd, the RMMP Ltd, and PVS & Brothers. As per an agreement among these three, the MSPL Ltd has the ownership rights for this CDM project and is the sole transaction entity with the Executive Board of the UNFCCC (United Nations Framework Convention on Climate Change).

The 125.15-MW wind power project comprises 83 WEGs (wind-energy generators) of 1250-KW capacity, 17 WEGs of 950-KW capacity, and 7 WEGs of 750-KW capacity. The project activity has been planned and executed in two phases, with capacities of 27.65 MW in phase 1 and 97.50 MW in phase 2. The plan and WEG allocations of the two phases are described below in Tables 1 and 2.

Table 1: Phase 1

S.No	Company	No of WEG's	Capacity (KW)	Make
1	MSPL	7 x 750 KW	5250	NEG Micon
		17 x 950 KW	16150	NEG Micon
		5 x 1250 KW	6250	Suzlon
Total			27650 KW	

Table 2: Phase 2

S.No	Company	No of WEG's	Capacity (KW)	Make
1	MSPL	41 x 1250 KW	51250	Suzlon
2	RMMP	31 x 1250 KW	38750	Suzlon
3	PVS	06 x 1250 KW	7500	Suzlon
Total			97500 KW	

Sustainable development

The MSPL Ltd is a proactive business entity and firmly believes that effective and efficient generation of green power, coupled with responsible environmental considerations, is vital to maintain a competitive edge. This has been a guiding factor towards their initiative in the conceptualization and installation of the 125.15-MW wind power project. To be competitive in the open market economy of India, the group is developing this project as a CDM project under the UNFCCC, which would appropriately reduce the use of coal and other fossil fuels in power generation, helping in significant reduction of GHG emissions and also promoting sustainable economic growth and conservation of the environment through use of wind as a renewable resource.

The project primarily assists the State of Karnataka – and India as a whole – in stimulating and accelerating the commercialization of grid-connected renewable-energy technologies. In addition, wind power projects of this magnitude, as conceptualized by this project activity, demonstrate the viability of larger grid-connected wind farms, which improve energy security, air quality, and local livelihoods, as well as assisting in the development of a sustainable domestic renewable-energy industry. The specific goals of the project are as follows.

- Operationalizing sustainable development through generation of eco-friendly power
- Increasing the share of renewable energy power generation in the regional and national grid
- Bridging India’s energy deficit in the business-as-usual scenario
- Providing national energy security, especially when global fossil-fuel reserves threatens the long-term sustainability of the Indian economy
- Strengthening India’s rural electrification coverage
- Reducing GHG emissions compared to business-as-usual scenario
- Reducing pollutants, such as oxides of sulphur, oxides of nitrogen, particulate matters, etc., resulting from the conventional power generation industry
- Contributing towards the reduction of power shortage, especially in the state of Karnataka
- Demonstrating and helping in stimulating the growth of the wind-power industry in India
- Enhancing local employment in the vicinity of the project, which is a rural area
- Capacity-building and empowering vulnerable sections of the rural communities dwelling in the project area
- Conserving natural resources, including land, forests, minerals, water, and the ecosystems

What the field study reveals

Sogi village

During a visit to the Sogi village area, R Manjunath Nayak (a civil engineer), B Hallya Nayak (a gram panchayat member of Govindpur village), and other villagers informed us that the wind mill project did not provide the village with any facility; the road built

through the village is primarily for the transport purposes of the wind mill project and not meant for the villagers. The project, which is located on the nearby plateaux, usurped people’s lands without paying the right price; while the market rate of one acre of land is 200 000 rupees, the company has paid a maximum amount of 80 000 rupees per acre. Worse, agricultural land lost for the construction of the road was compensated with only 5000 to 6000 rupees per acre. Moreover, any damage caused to the road by heavy vehicles of the company is now repaired using the gram panchayat fund. Patches of agricultural land lost to make way for tower lines for transmission of electricity were hardly compensated for—people have got a ridiculous payment of 500 to 1200 rupees. In many cases, people have not even been paid anything after losing land to the project.

The four power stations installed by the company occupy an area of 4/5 acres each, but the company has acquired 40 acres of village and forest lands. The area is mostly inhabited largely by scheduled-caste and scheduled-tribe communities, with a spattering of other communities; and for them losing land without any alternative economic options in place is a huge economic setback.

The company has not taken the necessary legal permission from the gram panchayat for setting up the project. Villagers said that the company gave assurance to provide jobs to them and thus duped them into signing some papers. However, no one has been employed in the project; a couple of local residents who were working as security guards earlier have now also been removed from their jobs.

Most youth in the village are educated; there are even some engineers and diploma-holding technicians from ITIs (industrial training institutes). But, the company shows no interests in employing them in the project, not even on contract basis. For instance, R Manjunath Nayak, a civil engineer, has long been trying to get a job in the project. But, the company management turned down his request by saying that it was against the company policy to employ local people on such type of jobs. His hope to get at least some contract works is also shattered, as all such works go to outside contractors.

While the wind turbines were being installed, only 20 per-cent people from the village got some work. The rest of the workforce was brought from other areas. While the construction was on, some workers were killed in an accident. The company hushed up the case by providing some paltry compensation of 25 000 to 50 000 rupees to the victim families. All the workers who died were from local communities.

Local villagers blame the coming up of the wind-mill systems for the erratic rain fall they are experiencing of late. Due to the working of wind mills, the monsoon is changing its course, they say. The local economy is primarily dependent on agriculture, and the change in rain-fall patterns has proved disastrous for them.

The noise from the wind mills has a huge deleterious impact not only on humans but on the entire biodiversity of the area. While people cannot sleep at night, cattle and the wildlife are frightened. No wild animal is seen in the forest now.

Villagers were also promised free electricity supply by the project; but that too has turned out to be a false commitment.

Jogimatti village

Village Jogimatti – a slum settlement near the wind mill project – is located in the urban area of Chitradurga city. The project itself is located in the forest area of Chitradurga. People of the village mostly work as labourers and have not lost any land to the project. The villagers, however, complained of the noise from the wind mill as a huge problem due to which they cannot even sleep at night.

Jajikalgudda area

Upon visiting Jajikalguda, it was revealed that it is in fact a cluster of many villages dotting the hilly area—Chitegiri, Adeveli, Nichapur, Nazirnagar, Hombergatta, Deverlimmalapur, and Tipahakaguhadli. From the Chitegiri village, the company has acquired four acres of land at a price of 40 000 rupees per acre. The Forest Department has ‘given’ a whopping 200 acres of forest land to this wind mill project.

A power station has been constructed in Nazirnagar village from where electricity generated at the wind mill is supplied to other areas. Here, only one person from the village has been employed, as a security guard.

In Hombargatta village, the wind mill project took ¼ acre of land from one person and, in turn, employed him at a tower construction site saying that it was a government job and gave him only 1800 rupees per month. After a few months, he was asked to leave.

The construction work has been given to a non-resident contractor, named Rajesh, who erects tower lines on villagers’ agricultural lands without paying any compensation.

The CDM hoax

The field visit clearly establishes that all the sustainable development indicators as described in the CDM guidelines have not been satisfied by the project

authorities. However, it seems, the project has managed to achieve a CDM status just by producing an impressive PDD (which looks and reads very much like the NSL PDD!). None of the promises made in the PDD about the project’s contribution towards sustainable development – strengthening India’s rural electrification coverage; enhancing local employment in the vicinity of the project, which is a rural area; capacity building and empowerment of vulnerable sections of the rural communities dwelling in the project area; and conserving natural resources including land, forest, minerals, water, and ecosystems – has been met. Nor is there any hint of a rural development programme to show that the company is bothering at all about those promises.

The MSPL did not even bother to conduct the necessary consultation process with the local population, village panchayat, and the local elected body of representatives before initiating the project. But the PDD claims to have roped in the people in ‘playing a big role in mitigating the climate crisis’ by directly participating in this CDM project. In reality, the local residents are not even aware about the nature and activities of the project, let alone concepts of CDM and carbon trading. Since the project has just led to a lot of woes for the people instead of benefitting them, the local populace hate the project.

However, the wind mill project is reaping huge profits both by selling electricity to the state grid and from its CDM component. On 12 February 2007, the project was issued 267 666 CERs for the verification period 22 March 2004 to 31 March 2006. Other parties in the CDM project are the United Kingdom and Northern Ireland. In monetary terms, this meant a windfall of no less than 4-million euros (going by the average secondary CER price of 15 euros during early 2007), provided that the project had sold all its credits at that time.

So much money...for doing what? We have seen how the apparently benign wind projects can usurp people’s commons and destroy livelihoods (also see *Mausam*, inaugural issue). We have also seen how the nicely worded and sleekly laid out PDDs can be full of unabashed lies. But, what about the tall claims of emission reduction? Wouldn’t the projects have come up anyway, with or without the CDM money? Is any wind CDM project in India truly additional?

Additionality

The additionality of the wind energy CDM projects in India has always been under the scanner mainly because of the existing subsidy regime—both the state governments and the Government of India offer a range of subsidies to any renewable energy project including

wind mills. Besides, there is this stipulation that the certain portion of the total electricity supplied to the grid and thereafter distributed to industrial consumers has to come from renewable sources. The UNFCCC has rejected a number of Indian wind projects on additionality grounds, including a Bajaj Auto wind project from Maharashtra.

Now that the Indian government proposes to extend incentives to wind farms for 10 years¹, the additionality of all wind CDM projects becomes doubly suspect. Perhaps the incentive move is due to the fact that wind is big business now; with the presence of corporate giants like Tata, Reliance, ONGC, and Suzlon, the government plans to extend GBI (generation-based incentive) to wind farms for a period of up to 10 years. Under this scheme, benefits equivalent to accelerated depreciation of 80 per cent at NPV (net present value) will be made available to private investors every year. The move is supported by the Planning Commission of India and the MNRE (Ministry of New and Renewable Energy), in tune with the National Action Plan for Climate Change.

Currently, the wind mills can enjoy 80 per cent depreciation benefit only during the installation period in the first year. However, the new move is likely to boost up wind energy production considerably as the country plans to double its installed capacity in this segment from the current 10 500 MW as on 31 March 2009 to 20 000 MW in the next five years. The plan is to add 2000 MW every year. The government plans to attract an investment – mostly from the private sector –

to the tune of 40 000-crore (400-billion) rupees in the next five years to create this additional capacity. ‘There are about 3000 private investors in this sector already and the proposed new benefit is likely to attract more investments from them,’ according to a senior government official.

With the forum of electricity regulators adopting the RPS (renewable purchase standards) on behalf of all states, private investors are likely to get assured returns for the excess power they generate. Under the RPS, states will have to commit to buy a certain per cent of their electricity needs from renewable resources.

The key states in the wind sector are Tamil Nadu (with an installed capacity of 4300 MW), Gujarat (1560 MW), Maharashtra (940 MW), Karnataka (1327 MW), and Rajasthan (738 MW). That the wind projects in themselves are extremely lucrative financial propositions is proved by the fact that a company’s stock prices soar as soon as it announces a wind energy programme. For instance, the shares of Gujarat NRE Coke soared 8 per cent on its windmill expansion plan in December 2007²; and the stocks of Suzlon, the biggest wind operator in the country, showed a consistent upswing throughout the first quarter of 2009³.

Nishant, with inputs from Soumitra Ghosh

(Nishant Mate is a social activist and researcher associated with National Forum of Forest People and Forest Workers. Soumitra Ghosh is a social activist and researcher associated with National Forum of Forest People and Forest Workers and NESPON)

¹ <<http://www.indianexpress.com/news/incentives-to-wind-farms-may-be-extended-for-10-years/448992/0>>

² <<http://www.business-standard.com/india/storypage.php?autono=306361>>

³ <<http://epaper.timesofindia.com/Default/Scripting/ArticleWin.asp?From=Archive&Source=Page&Skin=ET&BaseHref=ETD/2009/04/16&PageLabel=9&EntityId=Ar00901&ViewMode=HTML&GZ=T>>



THE CDM SCAM

Case studies on CDM projects in Maharashtra

1. The Deogad Hydroelectric Project

Location

The DHP (Deogad Hydroelectric Project) – owned by the Gadre Marine Export – is located in village Ghonsari in Kankawali taluka of the Konkan region of Sindhudurg district in the state of Maharashtra. The dam site is approachable from Phonda village on the Kolhapur–Ratnagiri road (state highway no. 49), which is 18 km from the Mumbai–Goa national highway.

What the PDD says

Project overview

The Gadre Marine Export is to generate power from the irrigation releases of the Deogad dam, utilizing the variable head. The intake structure consists of the trash racks, the stop log gates, the air vent, and the steel penstock in the body of the dam. The powerhouse is to be located at the surface downstream. The tail water will be guided through the tail canal into the steel penstock. The 2.2-m-diameter steel penstock is designed to carry a peak discharge of 10 cubic metres per seconds. On the downstream of the dam, a ‘Y’ piece is to be provided to this irrigation-cum-power-outlet in order to let out water directly into the river for irrigation whenever the powerhouse is to be closed. A butterfly valve in the powerhouse is provided for controlling discharge to the turbine. No additional storage or forebay, etc., is contemplated.

Sustainable development

The main objective of the DHP is to produce clean electrical energy in a sustainable manner, optimizing the utilization of water—a renewable resource. The electricity generated by the project activity will replace the electricity produced by thermal power plants that utilize fossil fuels in the grid. In the wake of power shortage and the ever-increasing demand for electricity in Maharashtra, implementation of the proposed project, with an installed capacity of 1.5 MW, contributes to help meeting the demand.

The Designated National Authority for the CDM in India, which is under the MoEF (Ministry of Environment and Forests), has stipulated indicators for sustainable development in the interim approval guidelines for Indian CDM projects. Each of these indicators has been studied in the context of the project activity to ensure that the project contributes to sustainable development.

Socio-economic well-being

- 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 the deficit grid of the state electricity utility. This includes improvement of electricity quality, frequency, and availability.
- The construction work will generate employment for the local population. There will also be various kinds of mechanical works on the site, generating employment opportunities on a regular and permanent basis. The transportation of various project components to the project site will also create work opportunities, thereby adding to the income of the local population.
- There will also be various kinds of mechanical works on the site, generating employment opportunities for the local populace on regular and permanent basis.
- The project will create indirect employment opportunities for 50—100 unskilled workers for a period of two years (during construction), which would not happen in the absence of the project. In addition, the project creates direct permanent employment for about 35 persons for the operation of the project.
- By promoting the decentralization of economic power, the project contributes in bringing economic sustainability around the plant site.
- The project activity also leads to the diversification of the national energy supply, which is dominated by conventional fuel-based generating units.

Environmental well-being:

- The hydroelectric project has no negative environmental impacts because it relies on existing irrigation releases and it does not involve any tree-felling or submersion, etc. Furthermore, adequate provisions are made for plantation and greeneries, making the area more environment-friendly.
- The project utilizes hydro energy for generating electricity replacing polluting fossil-fuel-based power plants, thus contributing to reduction in specific emissions, including GHG emissions. Use of hydro energy – which is a renewable resource – to

generate electricity contributes to resource conservation. Thus the project causes no negative impact on the surrounding environment, leading to environmental well-being.

- As hydel power projects produce no end products in the form of solid waste, such as ash, the problem of solid waste disposal encountered by most other sources of power is eliminated naturally.

What the field study reveals

A visit to the Ghonsari village, however, reveals something strikingly contrary to what the PDD claims. Villager Sakshat Prakash Parker told us that work on the so-called irrigation dam started 15 years ago and many villagers have lost their land and houses to this project. The population of the Ghonsari village is about 3000, and the primary source of livelihood of the villagers is agriculture. Out of the 12 *wadas* (specific community-based clusters) in the village, two have completely gone under water. People who have lost their land and houses were supposed to get the resettlement money in two phases.

In 2005, when the second phase of receiving compensation was due, people started protesting against the construction of the dam. Nevertheless, construction work was carried on by the contractor Nobel India Construction of Jaipur. The local people consider the Gadre Marine Export to be the sub-contractors for electricity generation, and because the irrigation project was not completed they now think that this project is only for electricity generation, which will not be for their use. Moreover, because people from the village got no employment during the construction work of either project (let alone any other benefit they are entitled to under the CDM norms, and which the PDD so loudly proclaims), they are angry with everything concerned with the irrigation/hydropower project. 'The contractor got all the workers from outside and we got nothing,' said the villagers in unison.

Sulentin Karlu Raise, another villager, who has lost half acre of agriculture land to the dam project, corroborated the fact that the company had indeed cheated the people on the assurance that local people would get employment during the dam construction and other project activities.

Jeron Baren, a clerk in the local gram panchayat informed that the company did not hold any public meeting with the villagers before commencing the project. 'They only sent a letter to the gram panchayat just to inform that it was going to construct the dam and the hydroelectric project,' said Jeron, 'It did not seek any NOC (no-objection certificate) from the gram panchayat.'

The village experiences power-cuts for eight hours a day.

The CDM hoax

The DHP has is a registered CDM project and the company in its PDD has announced scores of development programmes including poverty alleviation and environmental well-being.

But, we found that there has been no such project activity including the construction work that ensures direct or indirect employment generation or alleviation of poverty in this interior rural area. The PDD had, in fact, promised employment to at least 50 to 100 unskilled workers during construction of the dam and more employment during construction of the power generation facility. But, the company did not keep any promises made in the PDD. According to the PDD, at least 35 local villagers were to be recruited on permanent basis in the project; the company did appoint none.

Further, the company has not involved the local people in the transportation process, thereby depriving them of a possible income opportunity after acquiring their land.

The claim of the company as regards environmental well-being in the PDD that it would promote plantation and rejuvenate green areas has also turned out to be mere promises, as no such activity was visible in the area.

Any CDM project has to ensure participation of the local communities. In case of this project, the local people have little or no idea about the project activities, let alone its clean environment processes or the concepts of 'carbon trading' and 'carbon credit'.. Only after the work started people came to know that this project was to generate electricity.

While the company made no efforts to make the people aware about the CDM, carbon trading, or carbon credit through which the project would reap fat profits (the project claims to reduce 37 000 tonnes of CO₂ equivalent, meaning an equal amount of carbon credit) its PDD trumpets that the local people are playing a big role in addressing the climate crisis and in the reduction of carbon emissions!

The Vindhychal Hydro Power Ltd

Location

Site 1: Vajra

The Vajra small hydro project is located 6 km downstream of the Bhatsa dam at village Sarlambe in Shahapur taluka of Thane district in Maharashtra. The project is installed on a natural river fall, which is about 12.5 m in height.



Site 2: Chaskaman

The Chaskaman small hydro project is located at Bibi village in Rajgurunagar taluka of Pune district in Maharashtra. The project is installed on the main canal, which is a part of the existing dam.

Both the projects are owned by the VHPL (Vindhyachal Hydro Power Ltd).

What the PDD says

Project overview

The Vajra small hydro project is a run-of-the-river power project, where water from the river is diverted to the power house to generate renewable power, whereas the Chaskaman small hydro project is set up on an existing dam. The water released through the canal for agriculture is routed to the power house to generate electricity. These power projects, owned by the VHPL, are constructed on the existing water bodies; no separate water reservoir has been constructed. The installed capacity of each of the project is 3 MW. The project proponent has signed a power-wheeling agreement with the MSEB (Maharashtra State Electricity Board) and a power-purchase agreement with the INOX Air Products Ltd. Hence, electricity generated by these projects is being wheeled to the INOX Air Products Ltd using the Maharashtra state electricity grid.

Sustainable development

The VHPL believes that the project activity would contribute to shape the social, economic, and environmental well-being of the people in the region. The project activity would have beneficial effect on rural industries and generate employment in the region. Both the projects have taken measures to satisfy the indicators stipulated by the Government of India for sustainable development in the interim approval guidelines for CDM projects.

Social well-being

- The projects have already started working towards the development of the region. The company has helped to improve the conditions of the roads connecting to the project sites and other existing village roads.
- The projects have already generated employment opportunities for the local people, both during construction and operation phases.

Economical well-being:

The projects have created business opportunities for local stakeholders, such as suppliers, manufacturers, contractors, etc.

Environmental well-being:

- The projects are to generate electricity by using the renewable hydro resources to meet the ever-increasing demand for energy in the region. Not only the projects do not emit any GHG (greenhouse gas), they also help reduce GHG emissions by the quantity that would have been emitted for the generation of the same amount of energy by the western regional grid, which is mainly dominated by fossil-fuel-based power plants.
- The project activity is a step towards environmental sustainability, as natural, finite, and non-renewable resource like coal and gas are not used.
- The VHPL has carried out plantation in areas surrounding the projects.

What the field study reveals

Vajra hydro project

The Sarlambe village at the Vajra hydro project area is inhabited by Agari (other backward caste), Katkari (adivasi), and Harijan (scheduled caste) communities, with the total population of 1700. Deputy sarpanch, Madhukar Damu Tupe, and a former sarpanch, Laxman Hemaadikari, of this village informed us that the Basta Dam is very old and big, which the project is using to generate electricity. Before commencing its work, the company had neither sought the mandatory 'no-objection certificate' from the gram panchayat nor had consulted the villagers for their consent.

No villager was employed during construction and no one got any permanent employment in the project. Only two persons from the village have been employed as security guards.

The village road that the company is talking about was constructed in the gram panchayat with the *zilla parishad* (district council) fund. No business or any contract work from the hydroelectric project is coming to the villagers. The company has done some plantation but only within the project area.

Chaskaman hydro project

The Bibi village at the Chaskaman hydro project area is mostly inhabited by the Mahadev Kolis—an adivasi community. Balu Vaje, president of the Adivasi Kuti Samiti, informed us that the Chaskaman dam had displaced the village and some of the displaced people were rehabilitated 3 km away from the dam site at Bursewadi village.

The village gets electricity supply only for 5–6 hours a day. When the dam was under construction, regular

supply of electricity was promised to the villagers by the company. It has been two years since hydropower generation started, but the villagers are yet to get any electricity from the project.

There was no stakeholders' meeting involving the villagers and nor was any villager consulted before the project work commenced. The company took no developmental initiative in the area. Above all, the project provided no employment whatsoever to the extremely poor people in the villages.

The CDM hoax

This is yet another of those typical CDM projects, which neither created job opportunities for the local residents nor initiated any developmental work at the project area. Rather, the company fraudulently tried to take credit for the road construction, which was done by the gram panchayat. It has only partly benefited some local suppliers, manufacturers, contractor, etc. However, the company made the suitable claims in the PDD about socio-economic and environmental development in the region, and managed to get approval of CDM status for the projects.

In sharp contrast to all that the PDD claims about local participation and benefits, villagers were not even informed about the nature of project activities, let alone about the CDM aspects or the carbon-trading component of the projects. This project was issued 118 000 CERs (certified emission reductions) on June 2006. The other parties in this project are Sweden and the Netherlands.

The Alkyl Amines Chemicals Ltd

Location

The AACL (Alkyl Amines Chemicals Ltd) has proposed to expand its energy-generation activities by promoting a CPP (captive cogeneration power plant) based on biomass at its plant site at Kurkumbh in village Pandarwadi in the Pune district of Maharashtra. Kurkumbh lies on the Mumbai–Vizag highway (NH–9) and is located on the Sahyadri Plateau near the west coast of India.

What the PDD says

Project overview

The AACL is setting up a biomass-based CPP for meeting the heat and power needs of its chemical unit in Kurkumbh. Steam from the extraction-cum-backpressure turbine will meet the process thermal requirement. The proposed cogeneration power plant at the AACL will operate for 330 days a year, out of which it will operate on bagasse for a minimum of 270 days maximizing the seasonal availability of bagasse as a

biomass by-product from sugar-cane production. During non-availability of bagasse, the plant will operate on coal for a maximum period of 60 days.

Earlier the unit had a package-type smoke tube furnace-oil-fired boiler for meeting the low and medium pressure process steam requirements. The plant used to meet its electricity requirement partly from the state grid supply and partly from standby DG (diesel generator) sets. The steam (thermal energy) requirement for all the 330 days was being met from combustion of furnace oil. So, this cogeneration project is viewed as a proponent in conserving energy, cutting down on GHG emissions, as biomass is a carbon-neutral fuel.

Sustainable development

Indian economy is highly dependent on coal as fuel to generate energy and for production processes. Thermal power plants are the major consumers of coal in India and yet the basic electricity needs of a large section of population are not being met. This results in excessive demands for electricity and places immense stress on the environment. Changing coal consumption patterns will require a multi-pronged strategy focusing on demand, reducing wastage of energy, and the optimum use of renewable energy sources. The proposed biomass-based power plant by the AACL is a step towards meeting these goals of producing clean fuel, and satisfies indicators for sustainable development as stipulated by the Government of India in the interim approval guidelines¹ for CDM projects.

Socio-economic well-being

- The plant site is an isolated rural area where unemployment, poverty, and other economic backwardness are prevailing. The project would lead to the development of the region.
- Construction work will generate employment for local people around the plant site.
- Various kinds of mechanical work would generate employment opportunity on regular and permanent basis.
- Exploitation of the local biomass resources will generate work opportunities for the rural people in collecting and transporting biomass. In other words, the plant will be adding commercial value to agricultural residues, enabling the farmers to get better price out of their produce, which, in turn, will augment their income.
- It would provide stable and quality power to industry and aid in hassle-free manufacturing of products, leading to reduced cost of production.



- The project will create business opportunities for local stakeholders such as bankers, consultants, suppliers, manufacturers, contractors, etc.
- By contributing to the economic sustainability around the plant site, the project will promote decentralization of economic power.

Environmental well-being

- A cogeneration power plant based on renewable energy sources (bagasse) as fuel, does not affect the ecology, provided a few precautions are taken in the design of the plant. Such a project also reduces pollution in general. All the necessary measures are planned to be taken in the plant's design for minimizing the impact on the ecology of the environment.
- An ESP (electrostatic precipitator) is proposed for the cogeneration plant steam generator to contain the dust emission from the plant to a level of 150 mg/Nm³ during bagasse-firing.
- The proposed project ensures sustainability of the resource it will use. The biomass assessment survey conducted for the supply and demand of bagasse was positive and the project will ensure against any sort of resource degradation. Since bagasse is a by-product of the sugar industry, the project is friendly to the local biodiversity.

What the field study reveals

The Kurkumbh village sarpanch, Sunil Pawar, expressed his ignorance of any details about the project. The Pandarwadi sarpanch, Nanda Khandu Zhagade, and her husband informed us that this biomass-based cogeneration power project gets bagasse from several sugar-cane factories in the area.

The company has somehow managed to obtain a 'no-objection' from the gram panchayat, but without taking the consent of the *gram sabha* (village council). People had agreed to give up their lands for the company only upon the company's assurance to provide the villagers with permanent job to at least one member from each family. But, after acquiring 40 acres of village land, the company says that it has no vacancy in the plant. In the MIDC (Maharashtra Industrial Development Cooperation) area – where the plant is located – some people have managed to get only contract jobs.

People had staged strong protests against the breach of trust on part of the company. But, the village leader betrayed them and changed side after the company hired the bus owned by him on contract for its transportation services.

The energy company has, however, given some mats, chairs, and tables to the local school and the *anganwadi* (women's work groups).

Fly ash from the unit has polluted the entire area, harming crops. Agricultural fields and fruit gardens are almost destroyed by persistent pollution from the power-generating unit. Untreated toxic water is percolating into the groundwater and other water sources, depriving the local populace of access to clean drinking water. The MIDC makes its own drinking water arrangement for the households of their employees, while the local residents on whose land the plant is built are left with no option.

Due to unabated air and water pollution, people are inflicted with diseases, such as cough, throat ailments, asthma, tuberculosis, stomach infection, skin allergies, and so on.

The company pays the gram panchayat an annual tax of 600 000 rupees.

The CDM hoax

The AACL's tall claims in the PDD about cleanliness of the project are challenged by the fact that it continues to use coal along with biomass as fuel, and the power-plant emissions have mercilessly polluted the area, destroying the agrarian economy, and causing serious health hazards to the people.

All the promises about sustainable development – promoting social, economic, and environmental well-being by the project – also fall flat on the fact that the project has not led to any development of the region. Because the project area is located right on a national highway and well within the limits of an industrial development area, the PDD fraudulently portrays the area as an isolated place, evidently in order to justify the installation of the unit.

The PDD clearly mentions that the biomass resources would be collected directly from farm fields and transported to the plant site, thereby creating economic opportunities to the local residents. But, in reality, bagasse is being taken from sugar-cane factories to meet the requirement of the power-generating unit; there is no participation of the local people. So, the addition of economic value to locally generated agricultural residues, as promised by the company, is totally negated in favour of creating profits for the sugar-cane factories.

This supposedly clean industry, which is a registered CDM project, has polluted the entire landscape including the air and water sources, and destroyed people's livelihoods. Moreover, the project has brought unmixed misery – diseases and all – to the local

communities, instead of benefits.

The PDD says that the local people play a significant role in this CDM project. But people of the project area expressed total ignorance about the concept of clean development mechanism, carbon trading, carbon credit, etc. The company provided no information to the villagers about the nature and activities of the project. The only thing people know about the project is that it has caused untold problems to them. On the other hand, the company is earning good money by selling credits; it has already been issued 8864 CERs (worth anything

between 150 000 to 250 000 euros at the early 2008 prices), with the United Kingdom and Northern Ireland as the potential credit buyers. The project will supposedly reduce a total of 369 000 tonnes of CO₂, meaning an windfall of near-about 4.5 to 5 million euros—even at today’s reduced price! Who says polluters cannot be rewarded for their dirty deeds? And, did someone say: ‘polluters pay’?

Table 1 gives an overview of hydropower projects in India that are at various stages of CDM certification.

Table 1: Small hydropower CDM projects in India

State	Total projects	*At Validation	Registered	Request review	**2020 KCO2	***KCER issued
Andhra Pradesh	8	4	4		1871	386 (6)
Assam	1	1			616	116 (1)
Gujarat	1	1			253	40 (1)
Haryana	1	1			210	76 (1)
Himachal Pradesh	28	15	12	1	17 003	450 (9)
Jammu and Kashmir	1	1			301	
Karnataka	24	16	8		35 801	
Kerala	3	2	1		351	
Madhya Preadesh	1		1		88	
Maharashtra	7	4	3		6 541	
Punjab	4	1	3		82 050	
Tamil Nadu	6	5	1		15 141	
Uttarakhand	12	11	1		19 934	
West Bengal	1		1		941	51 (1)

(All the values are till 26 July 2009)

Source: <<http://www.cdmpipeline.org>>; <<http://cdm.unfccc.int/index.html>>; <<http://cdmindia.nic.in>>

* These projects are at the second stage of UNFCCC approval. Once the projects are validated by international validating agencies, these can go the non-Kyoto market (Chicago Climate Exchange, etc.) to sell their VERs or verified emission reductions.

** The total cumulative amount of CERs that the projects will collectively generate by 2020.

*** The amount of CERs or certified emissions reduction officially used. If handled by a broker of repute, these become secondary CERs and fetch the best prices. The number in parentheses denotes the number of projects that got issuance.

Nishant, with inputs from Hadida Yasmin

(Nishant Mate is a social activist and researcher associated with National Forum of Forest People and Forest Workers. Hadida Yasmin is a researcher associated with NESPOL)

THE CDM SCAM

Capitalizing power on curse land: the inside story of the Reliance Sasan Power Ltd

The Government of India has planned to set up nine special UMPPs (ultra mega power projects) in the country. Two of the pilot projects are in the states of Madhya Pradesh (at Sasan) and Gujarat (at Mundra), which are expected to generate as 70 000 MW of power and solve the issue of power crisis to a great extent. . While the Sasan project is an initiative of the RPL (Reliance Power Ltd) of the Reliance Group, the Mundra project is owned by the TATA Group.

Although the RPL was the second-lowest bidder for the Sasan UMPP, it eventually bagged the project after the lowest bidder, a consortium called the Lanco Globeleg, disintegrated and their bid declared invalid by an empowered group of ministers following allegation of misrepresentations in their bidding document.

Background of the Sasan project

The Sasan project – a 4000-MW UMPP – is a 20 000-crore-rupee (200-billion-rupee) project, and is envisaged to explore a debt–equity ratio of 70: 30 or 80: 20 to fund the project. To source the raw material – that is, coal – for this power project, the RPL has been allotted the Moher Amlai Extension Coal Block of the Northern Coalfields Ltd by the Ministry of Mines. The cost of the power project is 16 000-crore rupees while the mining component costs 4000-crore rupees.

Soon after getting the bid, the chairman of the RPL, Anil Ambani, met the chief minister of Madhya Pradesh in March 2008, and gave assurance to the government that the project would start generating power in four to five years. The RPL had also offered 1.20 rupees per kWh of electricity sold. Along with the Sasan UMPP, Anil Ambani had declared, the group was working on projects worth 500-billion rupees in the state that included setting up the Ambani Institute of Information and communication Technology in Bhopal and a cement factory in Satna district. Subsequently, the state government provided the company 125 acres of land in Bhopal to build the institute and 1306 hectares of land in Satna district for the cement factory.

What the PDD says

Project overview

India Sasan Power Ltd – a subsidiary of the RPL – is implementing a new 3960-MW project activity using higher efficiency super-critical technology, at its coal-based generation facility at Sasan, Madhya Pradesh,

India. The project activity will be commissioned with 6 units of 660 MW each.

The site of the Sasan project is about 8 km from Waidhan town and about 10 km from the nearest national highway. The Shaktinagar Railway Station in the state of Uttar Pradesh is the closest railway station located at a distance of 18 km from the site. Varanasi airport in the state of Uttar Pradesh is the nearest airport to the project activity.

Total reductions by the project is estimated to be 37 457 396 CERs, and the annual average over the crediting period of estimated reductions is 3 745 740 CERs.

The Reliance Energy Ltd

The REL (RPL was formed later, as part of the same Reliance Group, and many REL projects were transferred to the new company), is a fully integrated utility engaged in the generation, transmission, and distribution of electricity. One of the major private-sector entities in India, the aggregate estimated revenue of the REL is to the tune of 9500-crore rupees (2.1-billion dollars) with the total assets of 10 700-crore rupees (2.4-billion dollars). The REL distributes more than 21-billion units of electricity to over 25-million consumers in Mumbai, Delhi, Orissa, and Goa—across an area that spans 124 300 km². It generates 841 MW of electricity, through its power stations located in Maharashtra, Andhra Pradesh, Kerala, Karnataka, and Goa.

The REL is currently pursuing several power generation projects based on gas, coal, wind, or hydro in Maharashtra, Uttar Pradesh, Arunachal Pradesh, and Uttarakhand with an aggregate capacity of over 12 500 MW. These projects are in various stages of development.

The company on its own as well as through its subsidiaries is currently developing 13 medium and large power projects with a complete planned installed capacity of 28 200 MW, one of the largest portfolios of power generation assets under development in India. The identified project sites are located in western India (12 220 MW), northern India (908 MW), north-eastern India (12 900 MW), and southern India (4000 MW). They include six coal-fired projects (14 620 MW), to be fuelled by reserves from captive mines and supplies from both India and abroad; two gas-fired projects (10

280 MW), to be fuelled primarily by reserves from the Krishna–Godavari Basin of the east coast of India; and four hydroelectric projects (3300 MW), three of them in Arunachal Pradesh and one in Uttarakhand. Apart from the 4000-MW Sasan project in Madhya Pradesh, it has another UMPP in Krishnapatnam in Andhra Pradesh. But, its UMPP with 7480-MW capacity planned at Dadri in Uttar Pradesh is expected to be the largest gas-fired power project in the world. The company intends to sell the power generated by all these projects to state-owned and private distribution companies and to industrial consumers.

Sustainable development

Social well-being

- Project activity empowers economically weaker sections of the society, including the scheduled castes and scheduled tribes.
- Project participant is committed to carrying out the medical and health care. The project has constructed a new hospital and associated medical infrastructure, which provide medical care to the local populace. The project participant has also commenced the services with mobile medical care. During the past 12 months, 1875 women have been treated in the medical camps.
- Project participant is committed to promote increased educational levels in the project location. In order to improve educational facilities, project participant is constructing a new school near the project activity. For the current academic year, distribution of school text books, notebooks, and sports goods has been carried out in local primary and secondary schools. In order to discourage school drop-out, which is a major bottleneck for literacy rates, monthly stipends are offered to all students with higher stipends offered to girl students.
- The project location is predominantly waste land and people living in the areas have low levels of education. Livelihood is primarily dependent on the agriculture. Project participant is planning to undertake re-skilling of the local community both in technical and non-technical areas. The acquired skill-sets are proposed to be integrated during the construction and operation phase of project activity. This would enable the people to have steady streams of income thus addressing issue of livelihood opportunities and urban migration.

Economic well-being

- The project activity will address electricity deficit situation in India.
- The project activity has lower specific coal consumption. Amount of coal thus saved could be made available for other applications.
- The project activity improves India's energy security by expanding domestic energy resource base, reducing coal requirement through generation efficiency, and reducing import dependence. Out of India's non-coking coal imports of 41.52-million tonnes, approximately 57 per cent is used for power generation purpose. Being the domestic pit-head-based power plant with an annual coal requirement of 13.9-million tonnes, the project saves approximately 1-billion dollars of foreign exchange every year.
- Technical consultants and construction contractors associated with the project activity would be economically benefited during the construction and operation phase of the project activity.

Environmental well-being

- The project activity not only reduces CO₂ emissions to an extent of approximately 37-million tonnes during the registration period but also other major air pollutants such as suspended particulate matter, sulphur oxides, and nitrogen oxides.
- Under the integrated environmental development plan, the project activity is incorporating features aimed at preserving natural terrain, water run-off, removal of minimum vegetation, and prohibition of excessive excavation and terracing.
- Green belt would be developed not only to meet the mandated environmental requirements but also to introduce proven silvicultural practices to the region. Such practices include soil working, species selection, planting material, fertilization, protection, and post-planting management.
- All the major buildings and office complexes would be developed as energy-efficient buildings to qualify for LEEDS certification and TERI's *Griha* ratings.

Stakeholders' participation

The Sasan Power Ltd has identified all the people/parties involved with the project activity at any stage of its implementation/development and operation



and considers them as stakeholders of the project activity. Date and venue for local stakeholder consultation meeting decided was 10 a.m. on 28 April 2008 at Samudayak Bhavan, Sasan.

In order to reach out to all such stakeholders, an advertisement was published on 12 April 2008 inviting all of them to attend the local stakeholder consultation. Separate requests for participation were also sent out to the contractors, environmental consultants, officials of the district administration, and the media. Several participants representing local villages, District Collectorate, EPC contractors, and the media attended the same.

At the end of the consultation, stakeholders expressed keenness in the construction of the Sasan power project. While appreciating the environmental benefits offered by the super-critical technology vis-à-vis subcritical technology, which is prevalent in the country, stakeholders have also expressed their keenness to understand CDM-registered projects and the role India is playing in emission reduction. On understanding India is a major player in the CDM arena, stakeholders appreciated the efforts undertaken by the Designated National Authority for making India a leading player.

Ground realities



Figure 1: Mining at Amlori

The same old story of Land Grab

Land acquisition for the Sasan project is under way, in which 30 per cent will be government land and 70 per cent has to be acquired by the company from local landholders. The Gazette notification for the project was made on 11 July 2007, in which 946.58 hectares of land from the following five villages were identified for land acquisition.

1.	Tiara	76.27 hectare
2.	Siddikala	105.58 hectare
3.	Harhara	294.09 hectare
4.	Siddhi Kurd	427.08 hectare
5.	Jinjhi	43.56 hectare
	Total	946.58 hectare

The notification claimed that the project would

- provide 1500 MW of electricity to the state of Madhya Pradesh;
- follow the Rehabilitation Policy 2002 of the Government of Madhya Pradesh, which makes it mandatory for the company to provide employment to at least one person of the family who would lose land; and
- institute a trust involving the district magistrate to ensure welfare measures such as education, housing, and various civic amenities.

Ten per cent of the cost of the total land identified amounting to about 5.8-crore rupees and 10 per cent of the administrative cost amounting to about one-crore rupees has been deposited by the company in the government treasury.

People from the villages of Siddikala, Siddhi Kurd, Jhinjhi, Harhara, and Tiara have already been notified to vacate their land for the project. The affected people who are losing their land and houses and also the liberty to use local resources to sustain their livelihoods plead ignorance about any public-hearing associated with the EIA (environmental impact assessment) notification. As mandated under the Indian Environmental (Protection) Act 1986 and various amendments issued thereafter, conducting the EIA in consultation with the local people is mandatory before a project of this kind is approved.

TERI (The Energy and Resources Institute), an NGO, has been given the responsibility to oversee the rehabilitation process and the grievances of displaced people. Compensation has been calculated on the basis of the number of trees, status of residence land type, and irrigation facilities (including the number of wells), etc., as claimed by the district administration.

A field visit to the area established that it is not the company but the district magistrate who has been employed with special power to acquire land for the company. The district magistrate seemed to have been taking special interests in the land acquisition process. At a camp held at village Siddhikala, though it was not necessary for the district magistrate to be present, he

took part in it and showed a lot of enthusiasm. It is the SDM (sub-divisional magistrate) who has to sign the cheques and then distribute them. The government has already prepared the list of people to be compensated and the amount of compensation they will get; the cheques are ready to be distributed, if people accept the package. The compensation amount is set for 60 000 rupees per hectare of irrigated land and 450 000 rupees per hectare of un-irrigated land. People are, however, not satisfied with these rates of land acquisition, looking at the escalating price of land, availability of which is reducing everyday because of rampant mining. But, the absentee landlords – who stay outside the village – are ready to accept the cheques.

Sitaram Ram Bais of Siddhikala who was present at the camp for claiming the compensation demands, 'Let the company buy land in market rate; and why the government is interfering.' The government has evaluated all his property at 56 000 rupees (29 000 rupees for the house and 27 000 rupees for his 15-decimal land), which he claims is half of the existing market rate and is not willing to accept such compensation. Most other people in the village had much similar views and were not willing to accept the compensation package. However, few 'touts' having nexus with the administration had already purchased agricultural lands about four years back as they came to know about the Reliance thermal power plant being planned in the area.

On 6 January 2009, the administration in the presence of the district magistrate ordered demolition of 30 houses. The process was carried out without any prior notice to the people. These were the houses of those people who had been displaced a few years back by the NTPC (National Thermal Power Corporation) plant and its housing colonies, and were staying on this government land..

In Siddhi Kurd, there are about 100 such families who are going to be displaced for the fourth time. But, the administration does not pay any heed to their petitions on multiple displacements.

The land acquisition clause in the Madhya Pradesh Rehabilitation and Resettlement Policy 2002 says that if an area is 75 per cent irrigated, there cannot be any industrial establishment. Any person visiting the area cannot but notice the intensely irrigated green landscape. The back waters of the Rihand reservoir are quite sufficient for even a second crop. People also have dug wells, with the water table at a 90-foot depth, which add on to the already existing irrigation facilities. The problem, however, lies in the land-holding capacity of the people; most among them do not have more than an

acre of land and have to borrow water from others who have wells on their land. Their lands are not considered irrigated. The administration has manipulated the irrigation percentage without even considering the agricultural department's data. Only those with wells in their land have been considered to be owners of irrigated land. Even brothers who till separate lands but access the same wells as they used to before the division of their land are taken as tilling non-irrigated land.

Even in cases where the legal entitlement has not yet been transferred from the father to the sons or even the grandsons, the latter have no rights to any compensation and other benefits despite the fact that they are cultivating their pieces of land for years.

Reliance has also occupied forest land for the Sasan UMPP; recently, the Forest Department restricted them from erecting a boundary wall. Entitlements of this land to people who have been cultivating here since 1960 were cancelled, as the Forest Department claimed it had been encroached upon by these people. After people protested, they were paid some paltry amount as compensation and the forest land went under the possession of Reliance.

In Siddhi Kurd village, there are about 100 landless families who were displaced from Rihand Dam. These families have been cultivating the government revenue land since the past 15 years for survival. But, since they do not have the entitlements to their lands, they have not been considered for compensation. The number of families cultivating their crops but not having land entitlements and, hence, not being considered for compensation is 664 in Siddhi Kurd, 550 in Harhara, and 69 in Siddhikala.



Figure- 2: Image of the land belonging to village Siddhi Kurd, which is going to be displaced for acquired by the Sashsan power project

The company makes no assurance about giving permanent employment to people who are losing their land to the project. Some small jobs during the construction period are being assured, that too by the contractor. People who had entitlements for their land would be given some identification card for accessing the company's welfare schemes. Landless people and those who do not have entitlements for the land they were cultivating will not get this card.

People are at a loss and cannot understand why the company purchased about 400 acres of land in the Majhoul area in Bhasmadand, some 15 km from the affected area, to rehabilitate the displaced people. Bhasmadand is a water-scarce and a secluded place, and, moreover, it will make it difficult for the people to travel to the project area for work. The fact that they are not being rehabilitated on the unoccupied government land in nearby villages makes people doubt that this land will also be acquired by the company for their staff colonies

The PDD claimed that the company would build medical infrastructure in the area, but no such establishment is found there. Some people informed about medicines being distributed to the tribals. People are aware about the nature of the project and say that Reliance is going to produce some 5000 MW of electricity. However, they expressed complete ignorance about the cleanliness or the CDM aspect of the project.

There is no organized people's resistance in the area; no political party is even interested in taking up their cause. However, people are resisting, in a fragmented manner.

Amidst people's struggle in the time of devastation, referring to his ambitious plans to industrialize the state, the chief minister of Madhya Pradesh said that 'Singrauli will become Singapore', to which the local people responded by saying, 'Whether Singrauli will become Singapore or Singur, only time will tell.'

It may be noted that four new thermal power plants are coming up in the newly created Singrauli district with its headquarters at Waidan—HINDALCO, REL, JP Thermal Power Plant, and ESSAR. The NTPC had already been established some three decades back..

The Sasan project has failed to get the forest clearance and has run into problems relating to land acquisition and environmental clearance. The contractual date for land possession was 1 April 2009. The RPL demanded 3723 acres of land; the state government has asked them to scale it down to 3280 acres.

A note on the so-called clean-coal projects

The Sasan project is expected to start generating carbon

credits in 2011 and will seek an average of 3 745 740 carbon credits per year. By any means, this is an enormous amount and might translate into anything between 50- to 60-million euros, at the current market price.

Why Reliance or any other company should be allowed to earn so much money simply by burning a huge amount of coal is a question without any justifiable answer. The official argument was that adoption of a new technology (supercritical) in the Sasan or Mundra project will ensure that less CO₂ is released into the atmosphere. It is said that approximately 54 per cent of India's 123 907-MW installed capacity is based on sub-bituminous coal with the entire coal-based generation capacity implemented with sub-critical technology. As a result of supercritical parameters, operational efficiencies of the project activity will be higher than the identified baseline scenario of sub-critical technology. Higher operational efficiency will, in turn, lead to lesser coal consumption and lesser CO₂ emissions.

Such an argument defies commonsense. How can a thermal power project that will mine and burn thousands of tonnes of coal for years to come even remotely be considered as a CDM project? At a time when even a child is aware of the necessity of cutting down fossil-fuel consumption, who plans 'ultra mega thermal' projects and dares to call them environment-friendly? That countries like India and China require energy cannot be a justification for setting up large thermal plants, and then subsidizing and green-washing those by talking about 'new technologies'. The irony is that while every such project displaces and ruins thousands of poor families, pollutes the local and global climate, and destroys biodiversity, the Indian government argues for emission equity, on the pretext that India need to use coal as the primary source of its energy... to meet, among all things, its poverty alleviation and rural electrification goals!

The Indian government argues, and the World Bank and the UNFCCC approve. Clean coal or supercritical coal projects are now accepted by the UNFCCC as a valid category of CDM, and the World Bank Group's IFC (International Finance Corporation) would even go to the extent of supporting the Tata's ultra mega thermal project at Mundra. According to the IFC's environmental and social review summary for the project, 'Due to [Mundra's] high energy efficiency of supercritical technology, the CDM Executive Board meeting (under UNFCCC's Kyoto Protocol) of September 2007 approved the eligibility of supercritical coal-fired plants for carbon credit in developing countries, and the company is exploring an opportunity for the project to be registered under CDM.'

The bizarre rationale for this is that carbon emissions would be even greater if Tata installed the same power generation capacity in several smaller, lower-efficiency coal-fired plants without supercritical combustion technology. And, Tata can do so because India cannot be forced to control its emissions. So, the international community, via the IFC and CDM, subsidizes Tata to pollute less than it would otherwise. Scarce global resources are used to sweeten a private-sector project that will emit over 700-million tonnes of CO₂ during its operating life.

A note on the PDD of the Sasan project

To come back to the Sasan project, there are several significant lies and omissions in its methodology as revealed in the PDD, particularly in estimating emissions from the project. In coal combustion, the major disturbing element, besides CO₂ emission, is the fly ash and its content, in which nitrogen oxides are a critical component.

Various studies on this so-called ‘supercritical technology’ suggest that the level of emission depends on the type of coal used.

The Hitachi-Naka No.1 boiler is the first unit equipped with the newly developed Hitachi NR-3 burner. The NR-3 burner is the latest design in the NR series of rapid ignition low-nitrogen-oxide pulverized coal burners for large-scale commercial plants. Two types of coals – type A coal from Indonesia and type B from Australia – were tested during the commissioning phase. For both the coals, combustion tests were made with varying combustion settings and adjustments including air flow ratios. A reduction in outlet nitrogen-oxide emission led to less complete combustion of the fuel, resulting in a higher unburned carbon (UBC) level in the fly ash. As

type B coal has a high fuel ratio (that is, ratio of fixed carbon to volatile matter, 2.0) and high nitrogen content, it is normally difficult to achieve low levels of both nitrogen oxides and UBC in the fly ash simultaneously.

Source :(http://www.hitachipowersystems.us/supportingdocs/forbus/hpsa/technical_papers/CG2004.pdf)

In case of the CDM project in contention, it is for the first time Indian coal is going to be tested on this technology; so the amount of nitrogen-oxide and sulphur-oxide content of the fly ash is yet not known and might vary. Probably, that is why, very intelligently, the project proponent have omitted the nitrogen emission from calculations.

Regarding environmental sustainability, the PDD suggests that the project activity not only reduces CO₂ emissions to an extent of approximately 37-million tonnes during the registration period, but also other major air pollutants such as suspended particulate matter, nitrogen oxides, and sulphur oxides.

The PDD should not have claimed about emission reduction of nitrogen oxides and sulphur oxides reduction, as they have excluded it from the calculations, and neither the baseline scenario nor the projected CDM project mention emissions of nitrogen oxides and sulphur oxides. And, how come the expert authorities who validate such projects and approve them CDM status miss such blatant loopholes, consequences of which have a tremendous bearing on the planet?

Devjit Nandi & Vijendra Pardhi, with inputs from Soumitra Ghosh and Hadida Yasmin

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Waste-to-Energy Plants: clean or dirty ?

The waste story

Waste produced by the human society is gradually becoming a major threat to the environment and ecology. The more we become 'civilized', the more we produce waste. Our living style, our production mechanism, our patterns of consumption, our disposal habits—all are compounding the crisis by generating more and more waste. As a result, our air is getting toxic, our water is being contaminated, and the soil is turning poisonous. Urban agglomerations are the major contributors to this ever-increasing crisis. Municipal waste, which we produce in houses, market places, offices, commercial centres, hotels, etc., has the largest share in generating waste. How do we tackle this problem?

Wastes-to-energy or WtE plants are being brought in developing countries as solutions, with the pretext that they are of double benefits: (1) waste management and (2) production of electricity. They are also being labelled as 'clean development projects' to earn carbon credits. Before we go to review such technology, let us first have a glance at the present scenario and the other waste management practices as reference points.

Land-filling

Most of these waste generated in urban settlements remain littered anywhere and everywhere. Presently, some municipalities are just collecting the waste to dump it at some designated or undesignated sites. This is causing environmental, social, and health problems by polluting the air, soil, and water and breeding infections. Scavengers, both humans and animals, throng the dumpsites and become carriers of these infections. In many places, waste is being dumped into, or by the banks of, water bodies, rivers, and the sea. To solve the problem, a few municipalities have taken steps to construct sanitary landfills. But these are very expensive and cannot guarantee against air pollution or water contamination.

Allowing waste to rot in landfills (sanitary, designated, or undesignated) cause production of methane—a greenhouse gas, 21 times harmful than carbon dioxide. Availability of land itself in urban areas has also become a problem.

Reduce, reuse, recycle

Municipal waste is generally of three different kinds: (1) organic biodegradable and compostable (vegetables, fish, etc.), (2) recyclable (plastic, paper, etc.), and (3)

inert (construction debris, ash, etc.).

In developed countries, per capita waste generation is very high. Lot of packaging materials and unnecessary luxury items constitute bulk of the waste. Indiscriminate use of disposable plastic materials also generates lot of waste. Reduction of such waste can conserve sufficient amount of resources and also lessen hazards of waste management.

The practice of reuse and recycle that exists in our societies today is mostly triggered by poverty and hence the practice is very inefficient and unhealthy for people involved in it. The reusable and recyclable items when disposed of with all other waste get devalued. Yet, waste pickers and recycling workers—many of them children—collect these items from roadside and dumpsites to earn their livelihoods. Working in extremely unhygienic conditions, they serve the society a great deal—by helping to conserve resources and energy. If citizens are encouraged to segregate waste at source and the waste pickers are formally recognized and integrated into the collection system, and allowed to collect material from households, they can earn more decent livelihoods by selling the clean dry material. They can also be free from the unhealthy situation in which they have to work. Municipalities can also be benefited by reducing expenditure towards transporting these items to dumpsites. Municipalities are rather legally bound by the Municipal Solid Waste (Management and Handling) Rules 2000, which states,

'In order to encourage the citizens, municipal authority shall organize awareness programmes for segregation of wastes and shall promote recycling or reuse of segregated materials.'

Major portion of the waste, which is wet and biodegradable, may be taken to composting fields. Different methods of composting like aerobic, anaerobic, vermi, or combined may be taken up for recycling of such organic waste. Composting reduces the volume of organic waste drastically by 10 times. This compost when returned to soil increases soil fertility. Though it is required in a larger volume, it reduces the use of chemical fertilizer and also water. This compost can also be sold by municipalities. In fact, in the Kolkata Metropolitan Area, two facilities – the Chandannagar Municipal Corporation and the Bhadreswar Municipality – are functional for more than five years, selling compost at five rupees per kg.

The Municipal Solid Waste (Management and

Handling) Rules 2000 also states,

'Municipal authorities shall adopt suitable technology or combination of such technologies to make use of wastes so as to minimize burden on landfills. Following criteria shall be adopted: biodegradable wastes shall be processed by composting, vermi-composting, anaerobic digestion, or any other appropriate biological processing for stabilization of wastes.'

Aerobic composting does not produce greenhouse gas apart from little amount of carbon dioxide as part of the green lifecycle. Anaerobic digestion is taken up to produce methane consciously. This methane is trapped for using as fuel and is not released in environment. Moreover, the sludge from anaerobic process can be used as compost for recharging the soil. The process is called bio-methanation and is one of the WtE technologies. But, so far, this has not been done on a large scale.

Inert waste generated from urban settlements can be used for construction of roads, raising land, etc.

Through the practice of composting and recycling, most of the waste is put in a cycle that leaves behind very little remains to be released to the environment. Many societies in the world are now successfully adopting this as the *zero waste policy*. This is a proven low-cost solution to the waste management problem. At the same time, such processes ensure community participation and create a great number of jobs.

Incineration: waste to energy

Faced with a crisis of dumping land and also the environmental impact of waste-dumping or land-filling, some municipal authorities in developed countries have gone for costly technological solutions since 1960s. Waste incinerators were set up for burning waste to reduce the volume of waste and also to produce electricity from the heat generated thereby. It seemed nice that the technology helped to manage waste and produce electricity; but since 1980s, the environmental problems of incinerators started surfacing. People around such facilities complained about health problems and protested against running such polluting plants in their localities.

Scientific studies on health of the workers of such facilities and the people around, and also on organic and inorganic substances, recorded toxic emissions and hazards, much more than the protesters envisaged. More and more stringent pollution-control measures were made compulsory by respective authorities. Thus, incineration became very expensive. But, even the state-of-the-art technologies could not guarantee complete

pollution-free municipal waste incineration. Due to the high cost of their construction, no new WtE facilities have been built in the US in the last ten years. Now such technologies are being pushed into the developing countries. Before going into details of the problems let us have an overview of the MSW (municipal solid waste) incinerators.

MSW incinerators: how they work

Incinerators that are used to burn garbage are generally mixed waste incinerators, and referred to as 'mass burn incinerators'. This means that garbage is thrown into the burning unit without being sorted.

Garbage is burnt in the furnace for approximately 45 minutes at a temperature between 900 and 1100 degrees centigrade. The hot gases created by this burning are passed through an energy recovery boiler just downstream of the furnace. The hot gases surround the boiler pipes and boil the water contained in them, which, in turn, creates steam. The steam is then used for space-heating or put through steam turbines to create electricity.

There are also types of waste incinerators in which glass, metals, and other non-combustible materials are first separated. Then the waste is shredded and dried, and pellets are formed. These are called refuse-derived fuel or RDF and burnt in incinerators. Sometimes, RDF is prepared at one facility and then transported to another for burning. The shredded waste is also added as a fuel to boilers that burn fossil fuels.

Mass burn and RDF plants are the most common facilities in use today. But, there also are other technologies for turning waste to energy. Pyrolysis and thermal gasification are two such related technologies. Pyrolysis is the thermal decomposition of organic material at elevated temperatures in the absence of gases such as air or oxygen. The process, which requires heat, produces a mixture of combustible gases (primarily methane, complex hydrocarbons, hydrogen, and carbon monoxide), liquids, and solid residues. Thermal gasification of MSW is different from pyrolysis in that the thermal decomposition takes place in the presence of a limited amount of oxygen or air. The produced gas can then be either used in boilers or cleaned up and used in combustion turbine/generators. Both of these technologies are in the development stage with a limited number of units in operation. Most of the environmental concerns for incineration also apply to pyrolysis and thermal gasification facilities.

Environmental hazards, remedies, and cost

WtE plants with combustion technology are responsible for emissions from the incinerator stack and for fugitive



air emissions that escape from the plant through doors. The following are some of the environmental concerns associated with the operation of incinerators.

- *Acid gases:* Most of the chlorine in the waste stream is converted into hydrogen chloride, a strong acid gas, which at high temperatures attacks most metals it comes in contact with. Most of the hydrogen chloride can be removed with alkaline scrubbing devices before the flue gases leave the stack, but not necessarily before this acid gas has damaged some of the material from which the incinerator is built. Furnace linings, ductwork, and boiler tubes need frequent and costly attention.
- *Oxides of nitrogen and sulphur:* At the high temperatures of combustion, nitrogen and oxygen in the air combine to form nitric oxide. Because this gas is neutral, it cannot be removed by scrubbers using alkaline chemicals, such as lime. Systems involving the injection of ammonia or urea can convert some of the nitric oxide back into nitrogen, but these high-energy reagents are expensive (they are normally used as fertilizers) and the removal of the nitric oxide is only about 60 per cent effective. Any nitric oxide that is not removed is later converted by sunlight into nitrogen dioxide, which contributes to photochemical smog and acid rain. In a similar process, sulphur dioxide is also formed.
- *Heavy metals:* Due to the high temperatures, many toxic metals such as lead, cadmium, arsenic, and chromium are liberated from the otherwise fairly stable matrices like plastics. Furthermore, they are liberated in the form of tiny particles or gases, which, if they escape from the stack, vastly increase the potential surface area of contact between themselves and the environment. The traditional method of removing metals from emissions is via particulate-control devices such as ESPs (electrostatic precipitators) or baghouses (fabric filters). The former, while being very robust, are less efficient at removing the tiniest particles of concern. The latter are more efficient but suffer from frequent breakage and blockage and need careful maintenance. Besides, both are very highly expensive.
- *Mercury:* Mercury, a highly problematic pollutant, is difficult to control. At high temperatures, it evades the simple particulate-control devices discussed above in gaseous form. This makes trash incinerations a major source of mercury going into the environment. Many

modern incinerators now claim to have employed activated carbon to absorb the mercury. However, this is another expensive process, and there no effective way for general public to know that activated carbon is being used continuously. Even though mercury is removed efficiently, it still poses several further questions. What is the fate of the mercury captured on the activated carbon, or of the fly ash residues? Is the spent charcoal sent for reactivation; if so, where does the mercury go? Is the spent charcoal burned in the incinerator, in which case, again, where does the mercury go, as it can't stay in the incinerator forever? How does the presence of activated carbon affect the leaching and other characteristics of ash disposed of in landfills? In conditions of hot climate, will the mercury evaporate from the ash?

- *Persistent organic pollutants:* In the incinerator, combustion of PVC produces dioxins and fluoride compounds produce furans as by-products. These are known as unintentional persistent organic pollutants, which create enormous health hazards. The main response from consultants representing the incinerator industry to this discovery was the claim that as long as the incinerator furnace was operated at a high temperature all the dioxins and furans would be destroyed. However, such claims were subsequently found to be based on fraudulent manipulation of the data. High temperature alone cannot solve the dioxin problem. Dioxin can be formed after the flue gases leave the combustion chamber. If the flue gases from an incinerator are passed through air-pollution-control devices operating at temperatures in the range 200–400 degrees centigrade, it can increase the formation of dioxins and furans by more than a hundred-fold. A strategy that would essentially minimize post-combustion formation of dioxins would require the quenching of the flue gases immediately after they emerge from the combustion chamber. However, this strategy conflicts with the aim of generating electricity, because electricity generation requires the flue gases to go through boilers to generate steam to drive turbines.
- *Incineration ash:* Burning garbage does not magically get rid of the garbage. Far from eliminating the need for a landfill, waste incinerator systems produce toxic ash and other residues. Ash from incinerator poses a huge problem. Though the volume of waste in incinerator reduces by 80–85 per cent, reduction

by weight is only 60–65 per cent. That means three tonnes of waste produce one tonne of ash after incineration. And, this is contaminated ash. The better the air pollution control, the more toxic the ash becomes. Developing and maintenance of hazardous landfill for this purpose and disposal of this huge amount of toxic ash to the hazardous landfill are very expensive. Even after land-filling, release of mercury and dioxins in the environment may continue.

Health hazards of incineration

Waste incineration systems produce a wide variety of pollutants, which are detrimental to human health. The affected populace includes those living near the incinerator as well as those living in a larger region. People are exposed to toxic compounds in several ways, such as the following.

- By breathing the air, which affects both workers in the plant and people who live nearby
- By eating locally produced food or water that have been contaminated by air pollutants from the incinerator
- By eating egg, milk, fish, or meat of animals that have been infected by the air emissions

Dangerous effects of heavy metals are by now relatively known. Recent studies reveal that organic forms of mercury, dioxins, and furans through bio-accumulation and bio-magnification cause tremendous impact on human bodies, such as causing cancer, respiratory ailments, birth defects, hormone disruption, reproductive abnormalities and dysfunction, neurological damage, and so on.

Several epidemiological studies of incinerator-borne pollution have proven the following.

- A British study in 1996 of 14 million people living within 7.5 kilometres of 72 municipal incinerators concluded that these people have an increased likelihood of getting several different types of cancers.
- Three municipal incinerators in France were closed in 1998 because milk from cows on nearby dairy farms was contaminated with high levels of dioxins.
- In 1997, scientists in Japan found that the rate of infant deaths in areas neighbouring incinerators were 40 to 70 per cent higher than the average.

Greenhouse gas: incineration vis-à-vis recycling / composting

Incineration proponents point out that incinerators are greatly preferred to landfills because, handling the same amount of waste, they release only one-third the amount of greenhouse gases as do landfills. In addition, they show that energy created by burning garbage creates less greenhouse gases than does energy produced by burning fossil fuels because it does not release carbon that was stored deep underground. But this argument does not take into account the conventional fuels required for drying wet waste to make it combustible, energy-intensive pollution-control devices, and fuel expenses for land-filling of incineration ash.

As against common land-filling practices, waste diversion activities (like recycling and composting) is the most effective way for reduction of greenhouse gas emissions. As a result of these 'diversion' initiatives, greenhouse gas emissions, associated with methane generated when organic materials anaerobically decompose in landfills, are avoided. More importantly, however, are the upstream greenhouse gas emissions that are reduced directly through reduced energy consumption, non-energy-related manufacturing processes, and enhanced carbon dioxide absorption.

In fact, composting offers an environmentally superior alternative to land-filling that eliminates methane production, provides a series of economic and environmental benefits, and has a substantial impact on greenhouse gas reduction. Compost can significantly reduce agricultural energy demand. Plants grown in compost-rich soil require less irrigation because of the increased infiltration and storage capacity of root systems and the reduction of water runoff, evaporation, and water usage by weeds. Research has shown that the application of compost can reduce the need for irrigation by 30 to 70 per cent. The application of compost greatly increases the amount of carbon sequestered in soil.

Incineration is an end-of-the-pipe solution. It ends the life of everything it burns. Whereas recycling brings back disposed materials to life, and helps to save energy and resources. So, in terms of reduction of emission of greenhouse gases, waste incineration cannot be a viable option.

Economic and social impacts

Incinerators are prohibitively expensive. Building an incinerator is 30 to 50 times costlier than a composting plant with capacity to deal with same amount of garbage. Running such incinerators is 20 times costlier than a composting plant where recyclable materials can



be taken by recycling industries independently. More than half of the expenses in running an incinerator go for complex pollution-control devices, and yet pollution control is not guaranteed. The regular monitoring cost of incinerators is also quite prohibitive for developing countries.

Apart from the jobs created during construction, very few permanent jobs are created by an incineration plant later, despite massive economic investment. Most of the money spent on these incinerators goes into complicated equipments. A large incinerator may employ about only 100 workers. On the other hand, if the community puts its efforts into source separation, reuse, repair, recycling, and composting, more than 1000 people could find their livelihoods by jobs created both in the actual handling of the waste and in the secondary industries, which utilize the recovered material.

The money invested in the incinerator mostly does not come back to the community. The huge engineering firms that build incinerators are seldom located in the host community. And, if the firm is foreign-based, return on the investment does not even come back to the country. On the other hand, money invested in the low-tech alternatives stays in the community creating jobs locally and stimulating other forms of community development.

The truth is often concealed from taxpayers, because the incinerator projects are frequently promoted as being 'privately financed'. This, coupled with the PR hype of 'waste-to-energy', tricks many into believing that the public will not be paying for these facilities, when, in fact, apart from a relatively minor return from energy sales, the bulk of the repayment on the investment (plus profits) has to come from the tipping fee that comes straight from the general exchequer.

Taxpayers usually find out the true costs when it is too late. In order to pay back the massive investment involved in building an incinerator, the builder usually has to secure contracts, which commit municipalities to deliver their trash to the facility for an extended period of time. The latter have to sign a so-called 'put-or-pay' agreement. This makes municipalities to commit by default to deliver a prescribed amount of trash to the incinerator each month or year, at a fixed rate, and should they fail to do so they have to pay the scheduled amount anyway.

To understand the economic impact of an incinerator, the following simple points to be considered.

- A trash incinerator is the only kind of power station, which gets paid to accept the fuel it burns.

- The costs of generating electricity increases significantly as the fuel gets dirtier and trash is the dirtiest fuel burned in any 'power station'. Enormous amounts of money have to go into air-pollution control and ash disposal, if done properly.
- A trash incinerator has to run for several years before there is a net production of energy. Large quantities of energy have to go into building, operating, maintaining, and dismantling it after its life is over.
- The economics of paying for the building and running of an incinerator revolve round the tipping fee paid by communities to use the facility. The income from electricity sales is a minor contributor.

Incineration in developing countries

The main component of waste in developing countries is organic (vegetable peels, food refuses, etc.). In comparison to the northern world, per capita consumption of dry combustible waste like paper, plastic, metal in developing countries is much less—10 to 20 per cent. Moreover, a major portion of used dry materials are diverted to recycling facilities (either directly from the households or by the waste pickers). Thus, the left-out wet waste is required to be dried before putting them in an incinerator. A considerable amount of energy is required to make these wet waste combustible, which makes incineration more expensive. Waste in these countries is also full of dust and dirt (street sweeping, drain, silt, etc.), which makes incineration even inefficient.

Incineration operators naturally demand for more and more combustible input, mainly plastic. This goes against the policy of waste reduction and displaces people engaged in recycling activities. Again, municipalities have to pay tipping fees if sufficient amount of garbage is not sent to such facilities.

Particularly in case of India, according to the Bio-medical Waste (Management and Handling) Rules, chlorinated plastics (PVC) cannot be burnt. PVC is responsible for production of dioxins. But, in absence of any coding system, no mechanism to separate PVC from other plastics exists.

Several WtE projects have been installed in India. But, due to one reason or other, none of them has been sustainable. Even with non-municipal input, they have not been viable.

Carbon credits and cost-benefit

WtE (by combustion) projects are being awarded carbon credits, enabling them earn good sums on the

plea that they produce less greenhouse gases for power generation in comparison to the fossil-fuel burners. The waste is even termed as 'renewable energy'. But, in fact, the amount of fuel and energy input required for drying waste, controlling pollution, and ash disposal are not taken into account. Waste input also cannot be any means termed as 'renewable' as these sophisticated machines are actually destroying the materials instead of restoring them.

Despite the earnings from carbon credits and sales proceed of electricity, these plants are not sustainable. They need protection from public fund. This becomes obvious when Mr S P Gon Chowdhury, Managing Director, West Bengal Green Energy Development Corporation, and the proponent of the WtE project of the Howrah Municipal Corporation, said, 'Civic bodies need to change their mindset if they are serious about tackling the garbage issue. If a private company does take care of a section of it, they should get an incentive. Instead, all that civic bodies are concerned about is grabbing a pie from the carbon benefit that will accrue to the project'. He also added that half the funding should come from civic bodies as the project has a major social component.

In view of the above, one should understand that waste incineration neither manages waste properly nor produces electricity efficiently. Instead, they create pollution and destroy resources. Simply installing a project in the name of CDM (clean development mechanism), wasting tax payers' money, cannot be a responsible decision. While there are viable low-tech cost-effective solutions, why should we waste the public money in order to make way for the private companies to amass profits by selling dirty technologies?

Sasanka Dev

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(Sasanka Dev is the President of DISHA (Society for Direct Initiative for Social and Health Action), and has long been active in environmental issues in West Bengal. His organisation is partner of international networks like GAIA (Global Alliance against Incineration Alternative), IPEN (International POPs Elimination Network) etc.)

Proposed Waste-to-Energy Plants in Howrah and Kolkata

- Howrah, in the state of West Bengal, India, is an industrial city, with a municipal corporation. Located on the west bank of the Hoogli River, it is one part of a twin city that also embraces Kolkata, the state capital. Howrah is West Bengal's second largest city in terms of both area and population. Situated in the Kolkata Metropolitan Area, with an area of 52.74 km² and an estimated population of 1.2 million (the 2001 census had it at 1 008 704), the city is one of the most densely populated area in the world. Population density here is more than 20 000 per km².
- The city of Howrah produces 690 tonnes of municipal waste every day. The municipal corporation has miserably failed to comply with the Municipal Solid Waste (Management and Handling) Rules 2000. A small portion of municipal waste is transported and dumped in an open landfill at Belgachia, inside the city. Streets of all the 50 wards are perpetually littered with waste. Even the Howrah Railway Station yard, the gateway of Kolkata, has heaps of trash at every corner. The corporation has not made any effort towards reduction, source segregation, and composting of waste.
- The Howrah Municipal Corporation has decided to install a 7.5-MW waste-to-energy plant with refuse-derived fuel-combustion technology. SELCO International Ltd, a company with an ugly environmental track record, has been engaged to install the plant at Sankrail, about 30 km from Howrah in a rural area. So far, information collected by DISHA, an NGO working on environmental issues in West Bengal, from the municipal corporation under Right to Information Act (RTI Act, 2005) reveals that (a) capital cost (estimated in December 2007) of the plant is 42.79-crore rupees (8.8-million dollars); (b) the West Bengal Green Energy Development Authority is supporting the venture (labelling 'waste' as 'green energy'); (c) the project is likely to get the CDM certification; and (d) no public hearing has taken place in the locality to obtain consent of the local community. However, the corporation refused to provide information about the estimated running cost of the plant and its agreement with the company.
- Surprisingly, the corporation refused to provide the DPR (detailed project report). Replying officially to queries under RTI Act, the corporation stated, 'DPR has been submitted by the concerned company but the EMP (environment management plan) is yet to be submitted. However, copies of the DPR and the EMP cannot be supplied because the company has stated in their letter dated 15 September 2008 that the DPR is a confidential document and as such the whole or part of it should not be divulged to any person or organization other than the West Bengal Renewable Energy Development Agency or the West Bengal Green Energy Development Authority.'
- The managing director of the West Bengal Green Development Energy Corporation Ltd, S P Gon Chowdhury, said that though the state electricity regulatory commission fixed a tariff of five rupees per unit for electricity generated at the plant, issues like tipping fee, sorting of the garbage at source, and incentives from the civic body, as well as carbon credit, needed to be resolved to attract private investors.
- The Kolkata Municipal Corporation is talking to the city power utility – the CESC (Calcutta Electric Supply Corporation) – for a pilot project that will convert garbage into energy. The talks are in the initial stage and are expected to be crystallized in eight to ten weeks. Sources said that the Kolkata Municipal Corporation had already identified a site in Garden Reach for handing it over to the CESC in case the project went through. Though the city mayor, Bikash Ranjan Bhattacharya, refused to spell out further details until the project was finalized, he acknowledged that a pilot waste-to-energy project was on the cards. 'We will watch how it goes and then go for a bigger commercial project,' Bhattacharya said at the sidelines of a seminar on waste management on 21 August 2009, organized by the Indian Chamber of Commerce.

Waste to Energy CDM Projects in India: Sub-Type Wise

Types of CDM projects	Subtypes of CDM projects	Total projects	Statuswise CDM projects				2012 ktCO2**	2020 ktCO2**	kCERs issued*
			At Validation***	Registered	Reg. request	Correction request			
Landfill gas	Combustion of MSW	4	3	1	0	0	929	2722	0
Methane avoidance	Composting	3	3	0	0	0	948	2197	0
Landfill gas	Gasification of MSW	2	1	1	0	0	938	1819	76
Landfill gas	Landfill composting	9	4	5	0	0	2349	6328	0
Landfill gas	Landfill power	8	6	2	0	0	2892	8011	0
Methane avoidance	Manure	10	6	3	1		1430	3359	42
Methane avoidance	Waste water	32	24	7	0	1	6944	15787	430

Source:

<http://www.cdmpipeline.org/>

<http://cdm.unfccc.int/index.html>

<http://cdmindia.nic.in/>

*The Amount of CERs officially used. If handled by broker of repute, these become secondary CERs and fetch the best prices. The Number in parentheses denotes the number of projects that got issuance.

** The Total cumulative amount of CERs that the Projects will collectively generate.

*** These projects are at the second stage of UNFCCC approval. Once the projects are validated by International validating agencies, these can go to the Non-Kyoto market (Chicago climate Exchange etc) to sell their VERs or verified emission reductions.

Waste to Energy CDM Projects in India: State Wise

Types of CDM projects	Total projects	Statuswise CDM projects				2012 ktCO2**	2020 ktCO2**	kCERs issued*
		At Validation***	Registered	Reg. request	Correction request			
Andhra Pradesh	6		2	0	0	1540	2353	98
Chhattisgarh	2	1	1	0	0	670	1478	11
Delhi	4	1	3	0	0	768	2571	0
Gujarat	4	4	0	0	0	521	1299	0
Haryana	2	1	1	0	0	886	3635	0
HP	1	0	1		0	215	403	0
Karnataka	13	11	1	1	0	3628	9359	12
Kerala	3	3	0	0	0	643	1887	0
Madhya Pradesh	4	4	0	0	0	499	1378	0
Maharashtra	11	8	3	0	0	3377	8396	213
Orissa	1	0	1	0	0	86	234	0
Punjab	5	3	2	0	0	1604	4048	12
TamilNadu	7	6	1	0	0	1596	3466	118
Uttar Pradesh	14	10	4	0	0	2976	6443	0
WestBengal	1	1	0	0	0	354	708	65

Source:

<http://www.cdmpipeline.org/>

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*The Amount of CERs officially used. If handled by broker of repute, these become secondary CERs and fetch the best prices. The Number in parentheses denotes the number of projects that got issuance.

** The Total cumulative amount of CERs that the Projects will collectively generate.

*** These projects are at the second stage of UNFCCC approval. Once the projects are validated by International validating agencies, these can go the Non-Kyoto market (Chicago climate Exchange etc) to sell their VEs or verified emission reductions.

OPINION

Global Warming: what is to be done?

The subject of global warming has aroused concerns of a wide range of actors in recent years, from governments and international bodies to civil-society groups and individuals worried about the future of Planet Earth.

Barring an obstinate few, most are by now convinced that the phenomenon is not just real but one that is already causing untold damage to the world's ecology with more to come in the years ahead. Moreover, the impact of global warming is expected to be most severe on the people least responsible for the same—the poor everywhere, indigenous people, and all those living with small carbon footprints.

Much of the discussion on ‘what is to be done?’ to slow down global warming and mitigate damage has centred on the technical issue of cutting down emissions of CO₂ and other greenhouse gases. The Kyoto Protocol, agreed upon by governments around the world in 1992, for example, targeted to achieve by 2010 a collective reduction of greenhouse gases from industrialized countries by 5.2% compared to the 1990 scenario. In the past years, following severe criticism from green groups around the world, several governments like the United Kingdom have upped these figures drastically and promised as much as 80% reduction by 2050.

However, the mechanisms, through which such cuts are sought to be achieved, are replete with loopholes.

First of all, the emphasis – on either phasing out high greenhouse-gas-emitting industries over a period of time, using new technologies or creating new carbon sinks – is based on the unproven assumption that technology can ultimately solve the problems created by technology. This is clearly a bit of wishful thinking as the development and choice of technologies is not guided ultimately by rational principles of greater common good but by strong political and commercial interests.

Secondly, the CDM (clean development mechanism) and other forms of carbon trading, including in emissions trading, introduced by the Kyoto Protocol promote the use of market forces in form of carbon credits that accrue to carbon-saving projects in developed or developing countries. The credits can be purchased by companies in the North while they continue emissions as before. The logic behind this mechanism is that it will encourage lots of carbon-saving projects and once the price of buying carbon credits gets too high the companies in industrialized nations will also be forced to cut down emissions on

their own.

What the CDM skirts carefully is any discussion on the issue of compensation to be paid to communities around the world that have for centuries preserved and continue to preserve natural ecosystems that act as carbon sinks. For example, should not indigenous communities who safeguard forests be given compensation – both material and political – for their contribution to helping save the planet? Or, compensation for those who are already suffering the brunt of climatic change brought about by a few who consume more and promote destructive industrial growth?

It also bypasses the need for compensating people around the globe who lead lifestyles – due to tradition or even circumstances – that leave relatively small carbon footprint. There could easily be a global ranking system of people and communities according to the size of their carbon footprints in which resource from those at the top is diverted through global legislation to the ones at the bottom!

So, what are the alternatives that are really worth considering in the context of tackling global warming? For all my criticism of existing plans on this theme I accept that coming up with alternatives is not an easy task, as whatever we want to replace inevitably leaves its mark on what we think or claim is the alternative.

But then, without taking this risk, we cannot change anything at all and, hence, here is a modest attempt by suggesting an alternative path to the disastrous policies the world has pursued so far resulting in the catastrophic global warming. First, I would like to start off by looking at what are the objectives we want to achieve through our alternative policies. Some of the goals that come to mind are as follows.

- Obviously, the first task is to reduce overall CO₂ emissions, together with other greenhouse gases, as quickly as necessary to prevent the global climatic change from destroying much of the world. Alongside, we need to increase the ability of natural ecosystems to absorb the CO₂ already released into the atmosphere. While estimates vary, considering that we are not left with much time to act, whatever we decide to do needs to be done on war footing.
- These reductions must be made in a sustainable manner in order to have any real impact in the long term. This will require serious redefining of



the very concepts of modern civilization; economic growth; and the notions of prosperity, happiness, poverty, and sorrow as we know them. For example, in global climatic terms, the world 'poor' (barring the absolutely poor who need to increase consumption) should in fact be dubbed the truly 'rich' and become the model for future lifestyles. The slogan, in other words, should not be *Garibi Hatao* (remove poverty!) but *Amiri Hatao* (remove affluence)!

The next step is to consider the principles involved. Some of them I am going to list here may sound utopian, impractical, or naïve, and given the political realities we live with, some of this criticism may be true but again what I am attempting is to provide a broad framework that trade unions, environmental groups, and others will have to keep in mind while coming up with specific demands in their local contexts.

The first principle I can think of is simply that whatever we do to reduce CO₂ and emission of other greenhouse gases, the scope of our actions and changes must be global. Given that the problem itself is called global warming, merely tinkering with policies at the national and local levels, howsoever necessary on its own, is no longer enough. The political realities of the nation-state may be important, but they should not blind us to both the need and possibilities of global action.

The second principle is that any reductions must be brought about in a just and equitable manner. In other words, the reductions must be made primarily by those who are responsible for the highest amount of emissions. We know that, in national and geographical terms, the US and the European Union together account for nearly 40 per cent of the total global emissions. So, obviously they will have to take up primary responsibilities of any reductions that are necessary. Together, of course, the elites of all countries, including those of India, must be subjected to the same reduction regime, as beyond a certain level of consumption everyone in the world becomes an American anyway!

Another corollary principle is that reductions must not negatively affect those who are not only not responsible for such emissions but also already marginalized by the globe's unjust economic order. In fact, I would add that those who are adversely affected, say in terms of loss of jobs or income due to these cutbacks in CO₂ emissions, must be adequately compensated through a common fund created by taxing those who have been high CO₂ emitters, both historically and in the current era we live in. As mentioned before, indigenous people everywhere who have for centuries safeguarded important ecosystems that serve as carbon sinks must be suitably

rewarded on their own terms.

The third principle is to seek a balance between those CO₂-emitting activities that are considered vital for survival of human societies and those that are superfluous or considered to be luxuries. Power consumption for health safety of citizens, care of the disabled, elderly people, children, and so on, for example, will fall in the category of essential services while what constitutes luxurious consumption will probably include a host of modern-day activities—from air travel to the operations of shopping malls and 24-hour television channels.

The fourth and very important principle in this endeavour is to bring about all such reductions in a democratic, transparent, and accountable manner. Like, with many utopian goals in the past, it is very easy for the world to slip into a dictatorial mould with some demagogue or the other rising to say he or she would 'solve the problem of global warming forever' on behalf of fellow citizens if given the absolute power to do so. It is my contention that only democracy and a democratic process can ensure a just outcome ultimately.

With these objectives and principles on hand, we can do some brainstorming about the specific people, activities, events, and phenomena that we need to target in order to make the greatest difference to our cause. There are many such targets of course—lifestyle changes, new energy-saving devices, non-CO₂-emitting energy sources, and so on. Of all these, the most important one that needs to be tackled urgently is to put in place visibly effective regulation of global flows of capital.

If there is anything that the recent financial crisis has exposed clearly, it is that the concept of money and capital in our times is based on pure fiction; it is a superstition as much as belief in the magical powers of Sai Baba, the long hair of Sri Sri Ravishankar, the patriotism of L K Advani, or the economic wisdom of Manmohan Singh; and now the magic has worn off and the show is over.

This does not, however, mean that capital flows do not affect the real world of both animate and inanimate objects at all. The impact is, in fact, very severe if one looks at the way speculative capital has accelerated the activities of urban construction, private transports, energy production, and mining for natural resources in the past couple of decades.

So, it is clear that a global regulatory agency of some kind is obviously necessary to determine the speed, direction, and even the necessity of capital flows. This

measure will have to be global in scope right from the start, as otherwise it will not politically be feasible to implement it at national and regional levels.

But, going even beyond the need for regulation, I would propose that we make a pitch for changing the way money is understood, valued, and used. The idea of money started historically to facilitate exchange of goods and services but now it has acquired a life of its own well beyond and become immune to all known human and natural laws, whether of economics or even physics and chemistry.

We live in a world where money chases money to make more money and has become quite disconnected with the real world. Simply put, there is no basis at all for the valuation among currencies in the world today, despite the propaganda about 'demand and supply'.

In my understanding, the only rational method today for valuation among currencies is by making the value of national currencies inversely proportional to the per capita consumption of energy of the respective countries or, to be more precise, to the volume of CO₂ emitted by them. At the core of this currency valuation method is the simple principle that those who have larger carbon footprints should compensate those who have smaller ones, as their high consumption affects the viability of the entire planet.

Some of the obvious advantages of adopting this method are as follows.

- Carbon footprints of countries, economic and industrial sectors, and even individuals could today be calculated with great accuracy and, hence, valuation of the currency they possess could be tailored accordingly.
- It introduces a new concept of both wealth and poverty that rewards low-energy consumers and punishes those who consume more than average human need. In other words, it is a progressive taxation system based on sound ecological and scientific principles.
- This method of currency valuation will enable low-energy consumption regions to increase their consumption and high consumption areas to reduce theirs and, over a period of time, will improve equitable distribution of global resources. This could be fine-tuned to account for the differences between rural and urban areas, the rich and the poor within national boundaries.
- It will make the United States of America the poorest nation in the world and the Republic of Congo the richest.

Now, that would be something to really fight for even if we are too late to save the world from the ravages of global warming!

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