

## High growth: In deep waters

(Source: <http://www.indiatogether.org/2008/may/eco-projwater.htm>)

Resistance to large projects is founded on many fears and objections. Key among them is loss of access to water. Without proper consideration of the water impacts of development plans, public acceptance of these projects will remain elusive, writes Shripad Dharmadhikary.

**30 May 2008** - As the country pushes for annual economic growth of 9-plus per cent, a large number of projects - dams, mines, steel plants, SEZs - are facing massive resistance from locals in project areas, and also from other quarters. Much of this resistance is centred on displacement and loss of land. But there is another key issue, raised many times, but whose full implications are often underestimated - water.

Diversion of water for developmental projects can often mean that those using this water so far are suddenly deprived of it - much like what happens in the case of land. This can have serious consequences for the survival and livelihoods of large number of people, and raises questions about equity and inclusiveness of the development process itself.

### The Posco case

Consider the example of the Posco steel project in Orissa. Posco-India, a subsidiary of the Pohong Steel Company of Korea, is setting up a 12 million-tons-per-day steel plant in Jagatsingpur district of the state. The project is facing fierce resistance from the people in the area as the government and the promoters are set to acquire thousands of acres of land, in the process destroying livelihoods and pauperising many people. One of the concerns expressed by the people is also the huge amounts of water that the project is going to use. According to the Posco website,

"Water for the steel plant will be sourced from the Jobra Barrage of the Mahanadi River. The total industrial water requirement for the 12 MTPA steel plant is 3.50 cubic meters per second (cumecs)."

Three and a half cumecs is about 110 million cubic meters (MCM) per year or 302 million litres per day (MLD). This is a huge quantity of water and can meet the water supply needs of the five largest cities in Orissa including Bhubaneswar and Cuttack. Or it can irrigate about 54,000 acres of agricultural land. There is a growing movement around the water withdrawal in Cuttack, where the Jobra barrage is located. And even this figure of water use is based on a planned 96 per cent recycling of water. The actual water use of the plant could go up much higher if it is not able to meet the recycling targets.

The steel plant is only one part of the project. The project has several other components like captive iron ore mines in the districts of Keonjhar and Sundargarh, a captive 1300 MW power plant, captive coal mines, captive port, townships etc. Several of these components are intensive users of water.

For example, the water requirement of the iron ore mine is itself substantial, actual figures depending on the composition of the ore, and other project specific details. One estimate, based on the Central Pollution Control Board's figures of water needed for crushing, scrubbing, washing etc, and 20 millions tons of ore per year required by Posco for 12 million tons of steel production, suggests that the annual water needed for the iron ore mining part would be around 20 MCM. Other estimates suggest that

this could be substantially higher and even comparable to the water required by the steel plant itself.

Apart from directly using water, the project is likely to have severe impacts on water resources by either damaging water bodies or through contamination. In effect, the project will 'use up' far more water than what it directly draws, by making natural water sources unusable. According to Central Pollution Control Board's Report Development of Clean Technology for Iron Ore Mines and Development of Environmental Standards, September 2007 mining can require "surface water bodies ... to be removed from the area designed for the mining and associated activities ..." and "all the aquifers, including the water-table aquifer, above the mineral deposit to be extracted are damaged ..."

Moreover, a project like Posco can lead to severe contamination and pollution of water from effluents generated from the ore processing plant, surface run-off from various mining areas during monsoon e.g., waste/reject dumps, tailings pond seepage/overflow, oil and grease pollution from workshop effluents, thermal pollution from discharge of hot water from power plant, and impacts on marine water resources due to construction of steel plant at the mouth of the river Jatadhari.

In fact, a proper assessment of the total water that the project will use - directly and 'use' by rendering unusable for others - remains to be done, and if the company has done it, it remains secret so far. This water diversion, contamination and damage to water sources will have severe impacts on the livelihoods of thousands, if not lakhs of farmers, fisherpeople and others dependent on agriculture and horticulture. That the extent of the impact could be even bigger than the impact of land acquisition can be gauged by the fact that just the 3.5 cumecs water diverted for the steel plant can deprive about 54,000 acres of land of irrigation.

### **Tip of the iceberg**

Posco is only a tip of the iceberg and cannot be seen in isolation. Vast quantities of water (and land and other resources) will be needed for numerous other projects that are planned or under execution in this part of Orissa.

If one looks at the Mahanadi, Brahmani and Baitarani river basins in northern Orissa, or the districts of Jharsuguda, Sambalpur, Sundargadh, Keonjhar, Angul, Doegadh, Dhenkenal, Cuttack, Jagatsinghpur, Jajpur etc. one finds a large number of iron ore mines, bauxite mines, steel plants, thermal power stations and other projects either under construction or in the pipeline. All of these are highly water intensive, requiring large amounts of it for consumptive and other uses, causing much pollution and damaging water resources.

I will not attempt to give a comprehensive listing of all such projects, but let's look at thermal power projects as an example. From the projects that are listed by the Working Group on Power for the Eleventh Five Year Plan, or those that are pending for or have secured environmental clearance, there are now 33 thermal power projects - almost all coal based - with a combined installed capacities of 45,000 MW in this area.

A thermal power plant uses huge amounts of water. In a coal based plant, water would be used for various purposes, including cooling needs of the plant, ash disposal, keeping the atmosphere dust free, and so on.

Broad estimates indicate that about 3.13 lits of water will be used up for cooling needs per unit of electricity generated. This means that these 33 power plants of 45000 MW, operating at around 85 per cent plant load factor, would consume about 1050 MCM of water (or about 2800 MLD). Note that this is the consumptive use - that is, this water will be fully used up. This is a massive quantity of water, capable of irrigating about 520,000 ha. Additional water will be needed for other needs.

This is if the power plants operate on a closed cycle of cooling. If they operate on a once-through system, then they would need between 30-50 times more water, though this would not be consumptive use and most of it would be returned back to the system. We can understand the magnitude of this quantity if we see that this quantity would be about 75 per cent of the waters of the rivers Mahanadi-Brahmani-Baitarani - the three rivers that together contain about 71 per cent of Orissa's surface water.

Though this would be the gross, and not consumptive water use, the power plants will have to draw in this much water, and significant quantities of the returned water could be polluted (water used for ash disposal) or could lead to pollution due to thermal pollution (discharging high temperature water into natural water bodies leading to severe impacts on ecology, flora, fauna, fish etc), or pollution of ground water due to ash leachate, or pollution of surface water sources due to release or escape of ash pond decant into the local water bodies.

If we add to the power plants the proposed and existing steel plants, iron and coal mines, other industries, one can imagine the huge quantities of water that are going to required and diverted to industries. Further factoring in the likely pollution and other damage to water sources, it appears that entire water based livelihoods of agriculture and fisheries are facing a grave threat in the area that is the richest in water resources in the state.

### **Some lessons**

This is but one example to show how the process of economic growth and industrialisation is being pushed without even bothering to estimate the quantity of a key input like water that will be required. Such estimation is not even being done properly at the level of an individual project, and is totally absent at the cumulative and regional levels. Unfortunately, the impact that common people and the ecology have to bear is of the totality of all projects, not just the bits that are officially estimated.

Such assessments are critical, as water is not only necessary for the very survival of humans and animals, but also has high economic and livelihood opportunity costs. Water diverted for industry (or rendered unusable by it) means less water to irrigate lands, less fisheries, fewer livelihoods. Hence, it is also essential that such an assessment of water requirement needs be done in a participatory and transparent manner, clearly identifying who will bear the impacts of the diversion of water. Such assessments become even more important in areas with proposed heavy concentration of water intensive industry - Orissa, Singrauli (M.P./U.P.), or Konkan (Maharashtra) to name only a few.

It is only such an exercise that can establish whether the balance is in favour of industrialisation, whether and how much water can be diverted without large-scale destruction of livelihoods and whether there is larger public acceptance of these diversion. As it stands, the current model can only lead to industrialisation at the

cost of widespread destitution - the very anti-thesis of what the Approach to the Eleventh Plan calls for - "inclusive growth".

**Shripad Dharmadhikary**

30 May 2008

*Shripad Dharmadhikary coordinates the Manthan Adhyayan Kendra, a centre set up to research, analyse and monitor water and energy issues.*