

**POLITICAL ECONOMY OF
ENVIRONMENTAL DECISION MAKING
CASE OF HYDRO POWER IN KARKATAKA**

V. RANGANATHAN

May 1995

Please address all correspondence to:

**V. Ranganathan
Professor
Indian Institute of Management
Bangalore - 560 076**

Fax: 080 - 644050

**POLITICAL ECONOMY OF ENVIRONMENTAL DECISION MAKING
CASE OF HYDRO POWER IN KARNATAKA**

by
Prof.V.Ranganathan
Indian Institute of Management Bangalore

Wise countries have long since recognized the importance of hydro power. North America has exploited 83% of its potential of 184 GW, and West Europe has exploited 98% of its potential of 118 GW. This is in contrast to 14% exploitation of 663 GW by Eastern Europe, 36% exploitation of 513 GW by Asia and 8% exploitation of 225 GW by Africa. The nexus between economic development and hydro power development is evident. Yet there has been a reversal in the emphasis towards hydro development in India in the last few years and Karnataka has been particularly slow in exploiting its hydro potential. It has exploited only 2515 MW out of 8679 MW, i.e. a mere 29% of the total potential. Here, it is attempted to show how vested interests have joined hands with environmental activists in putting a brake to hydro power development in Karnataka.

As on 31st March 1994, Karnataka was having a peak demand of 3350 MW against a peak availability of 2939 MW thus having a deficit of 12.2% on peak demand. The energy deficit was reported from the Ministry of Programme implementation as 19%, second only to Bihar at 37%. During 1993-94, Karnataka Power Corporation and Karnataka Electricity Board produced about 13,900 million units from an installed capacity of 3145 MW and got another 3500 million units from its share of central sector generation making for a total supply of 17,444 million units. Transmission and distribution losses accounted for 18.6% i.e. 3180 MU and free

supply to KEB staff 219 MU. The unrestricted demand was estimated at 17,340 MU leading to the energy deficit of 19%. The T&D loss is likely to be an underestimate, since the difference between what is generated and what is metered and billed comprises of three components, viz. the T&D loss, irrigation pumpset consumption and unmetered connections for Bhagyajyothi schemes. Ignoring the last because it may be insignificant, the IP set consumption is normally overestimated to achieve a double benefit, viz. higher contribution to social objective of agricultural subsidy and lower T&D losses. It is interesting to note that eventhough KEB has sample meters installed for the purpose of estimating IP set consumption, it does not utilise this facility. The impact of the energy deficit coupled with inadequate investment and poor maintenance of the distribution lines, has been there for all to see. We reel under an unacceptable level of power cuts and power failures, and low voltage brown outs, which apply a brake on the high-tech lead industrial growth of Karnataka. To put things in perspective, it must be realized that the power failure problem is much more acute in Karnataka than in the neighbouring States of Tamil Nadu, Andhra Pradesh or Maharashtra, all of which have much higher total load and much less hydro potential than Karnataka. Table 1 gives a comparative picture.

Table 1
Power position in Karnataka vis-a-vis its neighbours

	1993-94					
	Energy demd.MU	% short fall	Capacity require- ment MW	% short fall	Hydro Poten- tial MW	% Exploi- tation
	(1)	(2)	(3)	(4)	(5)	(6)
Tamil Nadu	26,495	3.9	4650	18.8	1206	160 **
Andhra Pradesh	28,180	4.5	4800	20.1	2909	88
Karnataka	22,070	21.9	4150	29.9	4347*	55
Kerala	7,990	1.9	1750	19.8	2301	64
Maharashtra	44,895	3.1	7800	10.1	2460	51

Source: Central Electricity Authority &
CMIE, **Current Energy Scene in India June 1994**

* The Potential according to KPC is 8679 MW.

** Existence of pumped storage schemes and tail race schemes can lead to this apparent anomaly

\$ Capacity requirement = peak demand + losses + reserve margin

The reason for this difficult situation is that Karnataka has defaulted in its investment in power sector and has let the shortages grow. State Government has neglected power sector for a long time. Even now, state investment in power generation in 1993-94 was only Rs 389 crores (13% of total plan expenditure) and this has been reduced to about Rs. 300 crores (9% of plan outlay) in 1994-95. The net funds flow from Government to KPC is much less, of the order of about Rs.75 crores, the remaining being adjusted for KPC's payment of royalty of about Rs.40 crores and interest to Government.

Future demand scenario The 14th Annual Power Survey Committee of the Government of India has projected on the conservative scenario a load growth of 6.38% for Karnataka with the existing load restrictions. The projected peak load of 3771 MW in 1994-95 by the Annual Power Survey will not materialize. It is perhaps realistic to have a 7% growth on the base figure of 3350 MW of unrestricted peak demand in 1993-94. On this basis, the State needs an annual addition of 335 MW on an average, as capacity requirement. But as per the present plans of KPC as well as KEB's MOU with Cogentrix, only an average annual addition of about 228 MW is contemplated, till 1998-99. (This consists of the following additions: 210 MW in 1994-95 from Raichur Thermal; 100 MW in 1996-97 and 170 MW in 1997-98 from Kadra and Kodasalli on Kali; 210 MW each in 1997-98 and 1998-99 from Mangalore Thermal). Thus the prognosis of power situation for Karnataka is grim.

The nexus between environment and hydro electricity has been an important factor affecting hydro development. At the construction level hydro electricity involves negative environmental consequences, such as submergence of forest land and the concomitant loss of bio-diversity, both in terms of plants and animals, loss of a valuable carbon dioxide sink; the ecological consequences of loss of forests in terms of climate modulation, viz. reduced rainfall effects and the human problem of resettlement of the population that will be affected by the submergence. However, at the operational level, it is environmentally the most benign form of energy, without giving out the carbon dioxide, sulfur dioxide and the greer. house gas

pollution which are attendant with electricity production from coal or oil. Central to the issue of submergence is the optimum height of the dam. There is obviously a trade off between maximizing the benefits of electricity production and minimizing the area of land submerged and hence the people, plants and animals affected. The problem with many hydro projects including the Narmada Sarover is that enough alternatives are not generated to make this trade off explicit, nor are such trade offs dispassionately looked at and compensation mechanisms worked out. While there is always a price at which voluntary settlement can be reached with the affected people or the groups that espouse their cause, making up for the loss of flora and fauna is a more tricky and hence more intractable problem. While the concept of compensatory afforestation has mitigated this effect a bit, in practice it has not gone beyond compensating the forest department. Again, rigidity and extremism on either side should be avoided and a middle path should be struck. In the words of Dr.M.S. Swaminathan, the country needs an economic ecology, i.e. a concern for ecology, which will not come in the way of economic development. Operationally, the project authorities should consider lowering the dam height realistically and arrive at acceptable measures of compensation, both monetary and nonmonetary. At the same time, the environmentalists should not fret too much about losing a few obscure ayurvedic herbal plants or displacement of a few monkeys whatever may be the shape of their tails, because what is at stake is generation of large quantities of low cost power which will fuel development. It

should not be difficult to rehabilitate the animals and birds from the project affected area; in fact it should be easier. Some sociologists even give a caste colour to the large scale hydro, by insisting that it benefits the brahmins and forward castes at the expense of the tribals. This view is clearly absurd, since in our opinion voluntary settlement and fair compensation of both monetary and nonmonetary variety, not just one off, but over a period, can be an excellent opportunity afforded by the hydro projects in improving the standard of living of the project affected tribals. The real problem here is not in providing succour to the affected people or animals or birds, but in dealing with their representatives who have a vested interest, or who may be driven by external interests, like timber smugglers, illegal encroachers of forest lands who are more affected by the project, but who cannot come to the bargaining table and ask for compensation, except sabotage the very project with the help of environmentalists and corrupt politicians, who act as their front men. Some times these external interests can be foreign vested interests who do not like India to develop too fast. The Gujarat Chief Minister has gone on record stating that the environmental organizations in our country get funds from countries inimical to India's interests and that some times these funds can be in the form of awards. One way to get over this problem is to start a dialogue with the affected people directly right in the start of the project, through mechanisms like public hearings etc. and eliminate the environmental middle men.

Presently, the environmental decision making process and structure have several flaws, particularly in relation to the hydro power clearance. Firstly, hydro projects are subjected to double jeopardy, viz. they have to be cleared by the State environment department and the Ministry of environment at the centre. This introduces only delays without adding to the quality of decision making.

Secondly there is lack of clarity in environmental guidelines vis-a-vis approval or rejection of projects. For instance, how much of forests are adequate for sustainable development? Are forests actually getting depleted? What is the exact relationship of forest cover with ecological effects like rainfall? In most of the environmental debates, passion instead of reason rules while addressing these issues. The thesis that loss of forest cover will lead to aberrant rainfall and result in draught also needs to be questioned on more than ground. Firstly in Karnataka whether there is loss of forest cover itself is open to question. The satellite data appears to show the opposite, much to the disappointment of the foresters and environmentalists alike. While foresters can take credit for this, it also means no funds for social forestry programmes. Data on rainfall in Karnataka suggest that actually the mean annual rainfall has increased marginally, and not decreased. So this scare scenario of the adverse effects of deforestation on rainfall created by environmentalists has to be discounted. Similarly we need a clear cut set of trade offs criteria for acceptance or rejection, such as upto how many birds or animals can be displaced by a certain quantum of energy benefit.

Thirdly the Ministry of Environment and Forests (MOEF) lacks both the competence and credibility in conducting a professional environmental appraisal. In order to make up for the competence the Ministry has an Advisory Committee of external experts who de facto decide on the environmental aspects of the projects. The problem with this type of decision structure is that the members of the Advisory Committee have no accountability to the department or to any one for that matter, except for a one sided concern for environment. Particularly, by their very nature of expertise, they lack the ability to arrive at trade off decisions, weighing economic benefits against environmental costs. This then gives the MOEF the veto power over such projects without a fair appraisal of both benefits and costs. Therefore it is imperative that MOEF itself must have only an advisory role and the decision making role shifted to a place where economic and ecological considerations are weighed carefully. Also the framework of Advisory Committee, makes it easier for the Minister to decide on his/her own, since the advice can be dumped. And this leads to the question of credibility of the decisions of MOEF. Instances of this type of loss of credibility are many. It is common knowledge that the environmental ministry sanctioned the Narmada sarover project under intense pressure applied by the Gujarat Chief Minister through the then Prime Minister. While the ecological concern was blocking hydro development on the one hand, the same ministry -- true to the prescription of the World Bank Chief Economist Lawrence Summers -- is importing pollution through toxic wastes

from Australia in the pretext of jobs and incomes.

The MOEF also saddles the hydro projects with the so called Command Area Studies, which are outside the submersion area and hence are not affected by the project at all. This is clearly the job of the agriculture and rural development department. The idea seems to be, why not load part of the cost on the more affluent brother. Neither the hydro project authorities have the capacity to make the study; nor the MOEF the competence to evaluate it. Its only effect is to provide jobs for consultants and further delay the project.

The Bedthi project In the case of Bedthi hydel project, the MOEF withdrew its own clearance when in 1992, Ramakrishna Hegde, SR Bommai, RV Deshpande and Gundu Rao went and pleaded with the Minister Kamalnath. Hegde stopped Bedthi so that the next project, viz. Aganashini project which was in his constituency will not be taken up and the encroachers of forest land who were cultivating there would be protected. The State Government had spent Rs. 8 crores during 77-79 for this project when there was public agitation and the Government having in mind the forthcoming elections stopped the project. In 1981 a committee was constituted consisting of S/Shri HV Narayana Rao, KC Reddy, Mavin Kurve, BC Angadi and Father Saldana. This committee studied the project for 5 years, 81 to 86 and recommended continuation of the project with the Free Reservoir Level reduced from 1570 feet to 1540 feet. As a result, submersion would have reduced from 9800 hectares to 6800 hectares and submersion of forest area would have reduced from 6800 ha to 4000 ha. The State Government took another 6 years to accept this

recommendation and in 1992 finally cleared the project with the reduced height. It was at this time Hegde et. al blocked the project of their own State through the environment ministry requiring reappraisal of the project vis-a-vis its effect on flora and fauna, rehabilitation and resettlement and catchment area studies. Meanwhile an alternative plan was mooted from independant quarters that it is possible to further reduce the submersion area from 6800 ha to 4700 ha by having a series of 17 small dams instead of one big dam, but this would be basically run of the river scheme and consequently would not offer firm capacity benefit. Now, a fourth alternative is being considered by KPC, further reducing the submersion area from 6800 ha to a mere 564 ha with a capacity of 400 MW. However, the energy output will be reduced to 857 MU from 1080 MU, and the cost would be at Rs.1.33 per kwh. The cost is more because power house capacity is increased so that all the energy from the seasonal flow can be tapped.

In the case of **Kadra and Kodasalli projects on the Kali basin**, the environmental ministry first refused clearance on the grounds that part of the land to be given for resettlement was Forest land; now the project has been cleared since MOEF has realized that this land was deforested even before the Forest Conservation Act came into being. The only contribution of MOEF to this project is the World Bank's cancellation of loan on account of delayed environmental clearance. Work on the Kadra dam and power house in Uttar Kannada started in Feb. 1986 and the project was to finish by 1991. The original cost estimate of

Rs.34 crores has now escalated to Rs.70 crores and the project is expected to be completed only in 97-98. It is to receive loan assistance of Rs.30 crores from Kuwait fund for Arab Economic Development.

The **Gerusoppa hydel or Sharavathi Tail Race** Project with capacity of 240 MW and energy generation of 600 MU was also delayed because of environmental reasons. Here, even though there was no rehabilitation problem, there was agitation by local groups and court stay orders. The Mangalore University Report on STR says that the 700 hectares of forest land that will be submerged in Gerusoppa contains several endangered and endemic species of flora and fauna. Several of the animals in the area are said to have been those listed in the Convention on International Trade on Endangered Species appendices and Indian Wild Life Protection Act schedules, including the most endangered lion tailed macaque. The study also listed presence of several ayurvedic medicinal plants, as endemic, ie. germane to the area. When asked to clarify the scope of 'endemic' the researchers conceded that they are endemic to the whole area of Western Ghats of which the affected land was a miniscule portion. Similarly there was no problem for the lion tailed macaque to walk off a few km away! The project has since been cleared, but not before the World Bank cancelled the loan for this project too.

The World Bank cancelled the loans to KEB and KPC for the following reasons: Firstly it was opposed to tariff subsidy to agriculture borne by the KEB, consequently leading to the losses for KEB. Secondly it found that the contracts between KEB and KPC were not governed by commercial principles. For instance, KEB

owes KPC Rs.276 crores overall and Rs.101 crores for the current year alone. Consequently KPC's project execution capability is diminished. Thirdly, the contract system lead to delays, because there was no provision to compensate the contractor for a bonafide increase in costs, during the contract period. And fourthly there was too much foot-dragging on the issue of environmental clearance.

Hydro projects provide the best option for Karnataka's power and economic development. In Uttar Kannada alone we have 400 MW of Bedthi power at Rs.1.33 per kwh, another 460 MW of Kali power at Rs.1.2 to 1.7 per kwh and Aganashini project with 600 MW of power at Rs.0.68 per kwh. Also there is another 600 MW potential power at Barapole, Kodagu at Rs.1 per kwh, Almatti power of 268 MW at Rs.1 per kwh in Bijapur, and Tamanakal project of 800 MW at Rs.0.88 per kwh in Raichur. Compared to all these is the Mangalore thermal power availale from Cogentrix at around Rs.3.5 per kwh in 1997.

The other major cause of delay in execution of major hydro projects has been the inter-State river disputes. Here the judicial system has to squarely shoulder the blame for the inordinate delays. When it comes to adjudicating on sensitive issues like river disputes, the Courts and tribunals, use delay not as a means but as an end in itself. Now the nemesis is catching up with them; they are losing the lucrative market of adjudicating high value disputes from multinationals, as is evident from firms like Enron seeking the jurisdiction to be London courts for disputes involving the State Electricity Boards

in India. In Karnataka, 345 MW of power from Mahadayi basin at a cost of Rs.0.58 per kwh and 270 MW at an incredible 13 to 22 paise per kwh from Shivasamudram are stuck up due to inter-State river disputes with Goa and Tamilnadu.

Privatisation: The Government of Karnataka has been wanting to privatise in a rather one step forward two steps backwards fashion. Initially in a rush of enthusiasm, the MOUs for 3 hydel and 3 thermal projects were signed with foreign firms. However, saner counsel prevailed and the Government, this time for good reason, back tracked, referring the projects to irrigation department, Water and River Development Organization etc. As in all public vs private sector debates, here too, the dilemma is between inefficiency by public sector vs exploitation by private sector. There is no doubt that there has been inordinate delays in execution o projects by KPC, even in cases where it had no environmental alibi. For instance, the Raichur Thermal 4th Unit of 210 MW was started in early 1989 and the unit was supposed to be commissioned in 94. Now extension is sought for one more year, bringing the duration to 6 years. Normal period is 4 years; the very first unit of NTPC plant was commissioned in 4 years. Meanwhile the cost escalated from Rs.305.67 crores (Rs.1.45 crores per MW) to Rs.651.2 crores (Rs.3.1 crores per MW). Besides, KPC seems to lack the determination to push the State Government to prevail over the MOEF. Privatisation is likely to speed up the environmental clearance process through report to better compensation schemes with project affected persons and their representatives. Privatisation route will also provide opportunities for the project affected persons to hold

equity in the hydro projects thus providing them assured life time income instead of one time compensation. But the present schemes of privatisation are skewed far too much in favour of the private party. For instance 18 MW hydro project was handed to Boruka Power Company during Ramakrishna Hegde's regime. The cost of power from this project worked out to not more than 50 paise per kwh. But the Private Power Company sells power directly to industries at anywhere between Rs.2 to Rs.2.5 per kwh as against an average rate of 55 paise per kwh at which KPC sells to KEB. The investment cost of this project was around Rs.25 lakhs and Borukha would have recovered the investment within two years, leaving them with about Rs.20 lakh profit every year till infinity. So, in privatising hydro power, there must be suitable mechanisms that ensure that the cost advantage passes on to the society at large. In privatising with foreigners, there are the usual caveats to be borne in mind, such as their ability to jack up the equipment costs, which has gone up from Rs.1.5 crores per MW to about Rs.4 to 4.5 crores per MW in a matter of two years ever since guaranteed return on equity was promised; their jacking up the interest cost from the international rate of around 8% to about 13%, etc. Above all, the power sector costs will be too volatile since they will be closely linked with macroeconomic management and exchange rate of the rupee. In the case of the Raichur thermal 4th unit, the costs went up as mentioned earlier, mainly due to appreciation of the Japanese Yen since the project was financed with OECF loan assistance, and consequently tied to equipment purchase from Sumitomo Japan.

Conclusion Hydro power development should be given more priority throughout the country and particularly in Karnataka than what is given today. For this a proper appreciation of the trade offs between economic benefits and environmental costs must emerge. Both environmental extremism and bureaucratic rigidity must be avoided and a middle path struck. Privatisation may speed up the process of dealing with environmental issues, but Government must first acquire the skills of negotiating with foreigners and Indian private sector alike, in ensuring competition and thus low cost which is, after all the final goal of privatisation.