

## CORRESPONDENCE

### LINKING OF MAJOR RIVERS IN INDIA: BANE OR BOON?

The editorial on the above subject by the President of the Society is timely and covers all aspects of the problem though some of them need to be examined critically. The reactions to the article published in the May issue are also interesting.

If my memory does not fail me, the late Dr. K. L. Rao, a visionary, did not simply suggest the linking of Ganga and Cauvery but envisaged a water grid like that of the power grid. The idea is undoubtedly noble and the implementation requires colossal effort and staggering amounts of money. But if it had been taken up and executed, the gains would have been overwhelming.

Brahmaputra is a source of recurring floods year after year and the people of Assam are put to tremendous agony because of loss of lives and property. So too in other parts of the country like U.P. and Bihar, particularly the northern part of Bihar, is prone to floods more often than the other parts. The east coast is prone to floods at times of atmospheric depressions and cyclones. The floods that ravaged Orissa have their impact even today.

Other parts of the country too do suffer from floods but rather uncommonly.

#### Smaller Projects vs Larger Projects

The issues raised by Radhakrishna in his article of the March issue (2003) are debatable and contentious. He seems to favour smaller projects, which involve smaller investments and quick returns as against larger projects involving huge sums of money and a prolonged period of time to complete them. Undoubtedly there are virtues in both of them. The smaller ones can look after the needs of local people but such projects have no capacity to yield power whereas the bigger projects are of a multipurpose nature and generation of power is an important part of such large projects. The smaller projects can satisfy the local needs whereas the bigger ones are targeted to benefit large areas in which process some encased areas may be neglected. Further, one has to consider the cost versus return, which is much favorable in the large projects.

There seems to be an impression that it is a question of opting for small projects as against the large ones each of which have their own plus and minus points. I do not consider that it is a question of opting for large projects against small projects. They do not clash and they are complimentary to each other. Right now, we have several instances of large

projects and small projects in the same river valley like the Narmada and Krishna rivers. It is a question of ascertaining the virtues and merits of each one of them without prejudice and political implications. Recently, Laloo Prasad Yadav said that he would not permit a drop of Ganga to flow south. In his own state of Bihar the northern region suffers from floods and south Bihar and Jharkhand is dry. As scientists we should weigh down the political considerations and go by the merit alone.

Water harvesting is emphasized and no one can dispute this fact. But the whole problem is that we must have water to harvest. Further, they are not the universal answers to all problems. The floods in Brahmaputra cannot be tamed by water harvesting structures elsewhere. Again I wish to emphasize that I do not decry the need for water harvesting structures. Bunding of nalas, desilting of tanks etc. should be taken up in right earnestness. They all have their own merits and independent existence.

Radhakrishna mentioned of Telugu Ganga being taken to Chennai without quenching the thirst of the people of Guntur, Prakasam and Nellore districts and that the Telugu Ganga will be dry when it reaches Chennai. So also he speaks of the Sutlej-Jamuna canal. However, we have the Rajasthan canal and several relatively smaller canals, which are serving the farmers. However I do admit that in several command areas, the waters in the canal do not reach the tail ends because of seepage and over-irrigation of fields in the head region. One can rectify these impediments by proper steps such as canal lining (it may however cost considerable money) and educating the farmer about the repercussions of over irrigating their fields. Evaporational losses have been over-emphasized. This is one area where we have to live with the problem. Whether it is a reservoir in a dam construction or some harvesting structure, some evaporational loss is unavoidable.

#### Surface Water vs Groundwater

There is a quite an emphasis on the virtues of groundwater. Groundwater owes its existence to surface water and thus the mother of groundwater is surface water. Once the water goes underground the search for the groundwater starts. Unlike surface water, the exploitation of groundwater poses several difficulties. The certainty of finding groundwater is at best sixty percent if we keep our targets in mind. Then you require power to lift groundwater.

The number of pump sets operating in Andhra Pradesh alone is twenty-two lakhs". However, all these are not lifting groundwater and about five lakhs of them are used to lift surface water also. The total number of pump sets used to lift groundwater is beyond comprehension but undoubtedly a staggering figure. All of them require power and are bulk consumers of power, which is available in insufficient measure. Then the quality of groundwater is again a big problem. Many times it is not potable and in industrial areas the water is thoroughly useless. As an example, the groundwater in the Waiyangal district where the tannery industry flourishes, the groundwater is useless to any sort of consumption. Considering all these limitations one should not be over anxious to talk about the extended use of groundwater. Where the water is good enough for consumption, the levels of groundwater have gone very deep hiking its exploitation costs. At best groundwater can supplement the surface water to meet the human needs. In

extreme cases no surface water is available the groundwater becomes the only source to fall back. In hard lock areas the groundwater is hard to locate.

Linking of Rivers and Development of a Water Grid is only a Boon

This country's needs of water can only be solved by a water grid, which may be developed in time to come, which may be two decades or more. To deny the linkage of rivers is not at all justified. The inputs may be great and the time involved may be high but this is an exercise that has to be undertaken cutting across regional and political considerations. Such a grid alone will quench the thirst of people and our parched fields can be made to look green.

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<sup>15</sup> Data supplied by the Statistics Department of Andhra Pradesh through the courtesy of PJ Sastry

## INTERLINKING OF RIVERS

Ever since the late Minister for Irrigation and Power, Dr. K. L. Rao made a rather casual mention of linking the Ganga with the Kaveri, the idea caught the imagination of the irrigation engineers and has turned into a bone of contention between the riparian states and other organizations involved.

In fact, the idea is not novel. In the earlier part of the 19th century the Government of Madras entered into an agreement with the Maharaja of Travancore for the diversion of the flood waters of the Periyar. A four mile long tunnel was driven through the hard rocks of the Annamalais and a dam was built at Thekadi. The waters of the Periyar were diverted through the tunnel into the Kumbam valley of Madurai, to flow into the Vaigai. What is more surprising is the building of the diversion dam, called as the Grand Anicut, built by the Cholas across the flowing Kaveri. This structure diverts the flood water of the Kaveri into the Coleroon past the Srirangam island. The special lime mortar used by the Cholas, hydraulic lime, was used by the British engineers in constructing the Dowleswaram anicut on the Godavari near Rajahmundry.

The connecting of the Krishna with the Pennar, via the Cuddapah-Kurnool canal shows the keen observation of the engineers. In fact the canal follows the valley of the Kunderu, which is the abandoned course of the Krishna. Hence, the

Kunderu, in geological terms, is called a "misfit" of the Krishna. The diversion of the Krishna was due to tectonic disturbance. The diversion of the waters of the snow fed rivers to the rain fed rivers, is a multifaceted problem requiring a long-term multi-disciplinary study, comprising geology, topography, meteorology, hydrology, etc.

Even the limited objective of linking the Ganga to the Kaveri is beset with problems. It is known that waters of the Ganga are highly polluted both chemically and biologically. Hence purification costs will make the proposal uneconomic.

The case of interlinking the rivers of the Peninsula is again to contend with imponderables, not only the topography, but rock types and the structure of the Peninsula. It may be pointed out that the rivers of the Peninsula flow along the fault planes. Koyna and Mettur dams have shown that "reservoir induced seismicity" (RIS) is a potential danger which is unavoidable where large reservoirs are constructed.

Further, it is seen that these rivers are dependent on the NE monsoon and that they are in floods at the same time and this again inhibits the proposal of interlinking the streams.

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