DIFFICULTIES IN IMPLEMENTING NATIONAL WATER GRID

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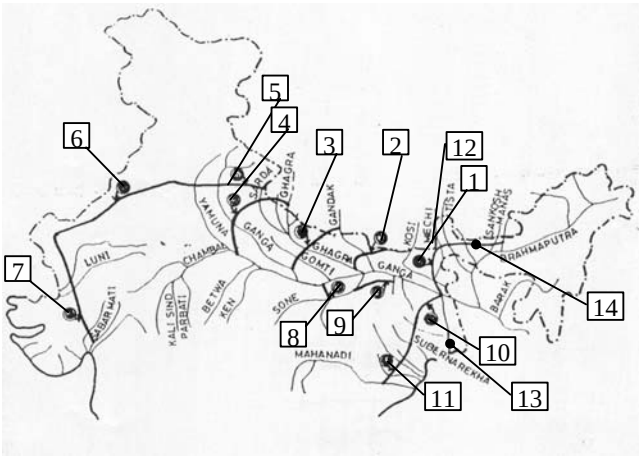
ABSTRACT

National Water Development Agency (NWDA) has proposed a National Perspective Plan (NPP) comprising of 14 canal links in the Himalayan component and 16 canal links in the Peninsular component of the scheme. One group of people, mostly govt. officials, is in favour of immediate implementation of the scheme while the other group, comprising mostly of NGOs, are strongly opposing it. Different benefits of the scheme are pointed out. various difficulties to be faced in the implementation of the national water grid as proposed by NWDA including the opposition viewpoints have been discussed. Recommendations of the National Commission on Integrated Water Resources Development (NCIWRD) with author's own views regarding implementation of the scheme are given at the end.

INTRODUCTION



Name of the Links

1. Manas – Sankosh – Tista – Ganga
2. Kosi – Ghagra
3. Gandak – Ganga
4. Ghagra – Yamuna
5. Sarda – Yamuna
6. Yamuna – Rajasthan
7. Rajasthan – Sabarmati
8. Chunar – Sone
9. Sone Dam – Southern Tributaries of Ganga
10. Ganga – Damodar – Subaranarekha
11. Subaranarekha – Mahanadi
12. Kosi – Mechi
13. Farkkha – Sunderbanas
14. Alternative of Manas – Sankosh – Tista – Ganga

Concept of national water grid for effective management of flood and drought situations in India has been introduced by a number of eminent persons like sir Arthur Cotton, Dr. K.L. Rao, Captain M. N. Dastur and many others [1]. Lately, the National Water Development Agency (NWDA) under the Ministry of Water Resources, Govt. of India, [2] has proposed the National Perspective Plan consisting of 14 canal links under the Himalayan component and 16 canal links under the peninsular component for transfer of surplus water to the deficit areas.. Figures 1 and 2 illustrate the proposed link canals under the Himalayan and Peninsular components of the proposed national perspective plan. Earlier plans could not be implemented as they were found to be technically not feasible and prohibitively costly. The National perspective plan prepared by NWDA, which was appointed by the Govt. of India in the year 1982, is being hotly debated. all over the country. A group of people, mostly in the Govt. sector, are strongly advocating immediate implementation of the project for our food security and other benefits. Another group of people [3], consisting mostly of NGOs, are strongly against the project as they are afraid that the project will bring disaster to the country. A Task force was appointed by the Vajpayi Govt. under the chairmanship of Sri Suresh Prabhu [4] after the Supreme Court order to implement the project in a period of 15 years by 2016. The present Congress Govt., however, are not in favour of bulldozing the scheme and wish to hear the viewpoints of all the parties concerned. A parliamentary standing committee, under the chairmanship of Sh. Sambasiva Rao, M.P.,was formed and the committee invited suggestions/opinions of public and experts in the subject. The committee is going to examine the representations and finally give its recommendation to the Govt. of India regarding implementation of the proposed scheme. In this paper, author wishes to first discuss briefly the different benefits of the scheme followed by the various difficulties in its implementation, as pointed by the two opposing groups. Recommendation of the NCIWRD [5] and the author's own views regarding implementation of the proposed national water grid are given at the end.

Fig. 1 Himalayan Component of National Perspective Plan Showing link Canals

TRANSFER OF WATER FROM SURPLUS TO SCARCE BASINS

History shows that the economic prosperity of a country and its cultural wealth are closely related with water resources development. India is blessed with ample water resources, but its enormous population growth has resulted in poor per capita availability. It may be interesting to know the per capita water availability of India vis-à-vis other countries in the World as indicated in table-1.

Table-1: Per Capita Availability Of Fresh Water Per Year (Cum / Per Person)

USSR	USA	Australia	China	India	Ethiopia
19500	9900	5000	2420	2214	250

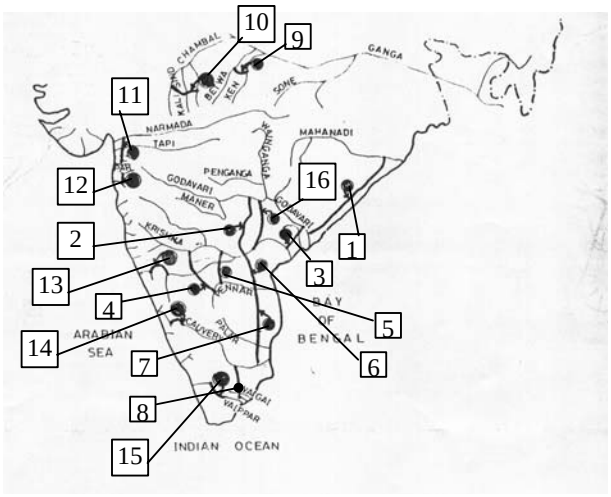


Fig. 2 Peninsular Component of National Perspective Plan Showing link Canals

Name of the Links

1. Mahanadi – Godavari
2. Godavari (Inchampalli) – Krishna (Nagarjuna Sagar)
3. Godavari (Polavaram) – Krishna (Vijayawada)
4. Krishna (Almatti) – Pennar
5. Krishna (Srisailam) – Pennar
6. Krishna (Nagarjunsagar) – Pennar (Somasila)
7. Pennar (Somasila) – Cauvery
8. Cauvery – Vaigai – Gundar
9. Ken – Betwa
10. Parbati – Kalisindh – Chambal
11. Par – Tapi – Narmada
12. Damanganga – Pinjal
13. Bedti – Varda
14. Netravati – Hemavati
15. Pamba – Achankovil – Vaippar
16. Godavari (Polavaram) - Krishna

Areas with availability less than 1000 cu. m. per capita per year is designated as scarcity areas. Although, the average figure (2,214 from table-2) for India, as a whole, shows it is not deficit, but when we look at the spatial distribution of water from basin to basin, it is noticed that there is a great deal of non-uniformity principally due to extreme non-uniform rainfall distribution in our country. Table-2 gives the list of surplus and scarce basins in India. One of the fundamental objectives of the proposed river link is to bring equity in water availability by transferring water from surplus basins to the scarce basins.

The scarce basins are often subjected to droughts and the surplus basins are frequently devastated by floods. The flood and the drought occur almost simultaneously leading to loss of human life and animals, damage to crops and properties, disruption of communication and so many other miseries. Annual average flood damage has increased from Rs. 52 Crores in 1952 to Rs. 5,846 Crore in 1998. Flood prone area in India is about 40 mha out of which 7.5 mha gets flood affected almost every year. Droughts, on the other hand, result in loss

Table 2: Surplus and Scarce Basins in India

Surplus Basins		Scarce Basins	
Name of Basins	**Per Capita Availability in Cum. Per Year**	**Name of Basins**	**Per Capita Availability in Cum. Per Year**
Brahmaputra Basin	18,417	East flowing Rivers between Mahanadi and Pennar	919
Barak Basin	7,646	Cauvery	666
West flowing Rivers between Tadri and Kanyakumari	3,538	Pennar	648

West flowing Rivers between Tapi and Tadri	3,194	West flowing River Basin of Kutch and Saurashtra including Luni	631
Narmada	2,855		
Brahmani-Baitarni	2,696		
Mahanadi	2,546	East flowing River Basins between Pennar and Kanyakumari	383
Godavari	2,026		
Indus	1,757		
Ganga	1,473		

of soil moisture leading to loss of crops and the people are deprived of even the basic need of drinking water. The flood-drought-flood syndrome in India, occurring almost regularly, is causing disaster to the nation. The primary purpose of the national water grid inter-linking the rivers is to transfer water from the surplus basins to the deficit/scarce basins for optimal use of national water resources and its equitable distribution amongst the states. By 2025 our total demand of water of 1050 Km^3 (Food – 770, Domestic Water Supply - 52, Industrial Use – 120, Power – 71, Miscellaneous e.g. Salinity, Pollution Control, Navigation, Recreation etc. – 37) is going to be more or less equal to utilizable water resources of the country estimated as 1100 Km^3 (700 Km^3 from surface water and about 400 Km^3 from ground water) [6]. Acute scarcity of water supply will arise after 2025 unless we control the growth of population

BENEFITS OF THE PROPOSED NATIONAL WATER GRID

Those who strongly advocate implementation of the national water grid linking Indian rivers cite the following benefits which the project is likely to bring about for an all round development of the country

Food Security

The projected population of India is expected to stabilize at about 1600 million by the year 2050 from the present population of about 1050 million. The food requirement for this increased population will rise from 205 million tons at present to 460 million tons in 2050. The proposed grid is going to increase irrigated area from the present 113 million hectare to 148 million hectare by 2050 ensuring our food security.

Hydropower Development

At the present, the share of hydropower is only about 25% of the total power generation since our hydro-power development is only about 22,000 MW out of the potential of about 84,000 MW. Only 2% of the potential of north-east has been developed so far, although 45% of total hydro-power potential of the country lies there. The proposed grid, especially the Himalayan component, is going to provide 34,000 MW of additional hydropower for peaking purpose and for increasing the desired share of hydro to 40%.

Water Supply for Drinking and Industry

The proposed grid envisages supply of clean drinking water and water for industrial use amounting to 90 and 64.8 billion Cum. respectively with a view to meet the demand by 2050. This will remove the current hardship, especially for the rural women who has to walk long distances daily to collect water for drinking and other domestic uses. No industrial growth is feasible without guaranteed water supply.

Navigation for inland water transport

Compared to railway and road transport, inland water transport is cheaper, especially for bulk transport of commodities like ores, coal, food grains, forest products etc. Currently, the waterways run only for about 120 days or so in a year due to inadequate depth, which is less than the required minimum depth of about 2m. The proposed grid is going to ease pressure on railways and roads by introducing inland navigation – through National Waterways (no I, II, & III) by guaranteeing a minimum 2 m depth of water on all the 365 days in a year.

Flood and Drought Protection

As already pointed out, while one part of the country is devastated by recurring floods, the other part is suffering from drought due to acute shortage of water. The main challenge is how can the water causing devastation and running waste into the sea (especially from Brahmaputra, Ganga and Mahanadi Basins) can be diverted for productive use in the drought prone areas in the South and the West, so that the country gets rid of the current flood-drought-flood syndrome.

Employment Opportunities in Rural Areas

People in the rural areas are now compelled to migrate to cities in search of jobs, causing rapid deterioration of our national economy. Villages are getting poorer and cities are getting congested – resulting in unprecedented pollution of air, water and soil in the cities. Only way to reverse this unhealthy trend is to create more job

opportunities in rural areas through agricultural and agro-industry based projects. As the proposed grid and the storages are going to be mostly in rural areas, it is going to create large employment opportunities for the rural youths.

Dry Weather Flow Augmentation

Transfer of surplus water stored in reservoirs during monsoon and releasing it during dry season will ensure a minimum amount of dry weather flow in the rivers which will help in pollution control, navigation, fisheries, growth of forests, protection of wild life etc. Any water body either in storages or in flowing links will be very attractive and offer recreational opportunities for both rural and urban people.

DIFFICULTIES IN IMPLEMENTING THE PROPOSED SCHEME

There are several issues and challenges involved in the scheme [7]. The several difficulties that the Govt. is facing in the implementation of the proposed scheme may be summarized as follows:

Opposition to Interlink

A group of people, especially the NGOs, the Socio-Economic and the environmental group [8] are strongly against the inter-link. They apprehend that such a massive inter- basin transfer of water will result in environmental degradation, loss of aquatic eco-system, loss of land, forests, fisheries and the livelihood of the poor people who thrive on them, massive displacement of people, evaporation losses, water logging and salinity and possible change in the climate [9] due to submergence of vast areas of land in reservoirs and the huge network of unlined open canals. The massive investment (Rs.5.6 lakh crores) required for the implementation of the project, which is likely to further increase manifold [10] due to cost and time overrun, is going to deprive other important projects for our socio-economic development due to diversion or inadequacy of funds. The loans from world banks etc. may subject the country to a permanent viscous debt trap where the country is likely to lose its economic sovereignty and dictated by foreign powers granting the loans. They also complain about inadequate information and transparency about the scheme, lack of data regarding cost of other alternatives to inter-link e.g. what will be the cost of transporting surplus foods (by increasing productivity of irrigated land. from the current figure of 2 T/ha to 4 T/ha or more) from water surplus areas to drought prone areas as an alternative to long distance water transfer for irrigation. As only a small part of floodwater (approximately 3 % only) will be stored and transferred, there will be hardly any flood relief. Droughts may not occur concurrently with flood and it may not be feasible to remove drought in all the distant areas ,especially those lying in higher altitude due to excessive cost of pumping.

Change in Constitution

Water is a state subject under entry 17 of state list- II subject to entry 56 of central list- I at present. Even if the project is found to be techno-economically feasible, implementation of the same will be a Herculean task. It needs constitutional amendment. Most of the donor states, even though surplus, will be reluctant to part with its resources free of cost and shall try to project their future demands stating that their surpluses are owing to lack of sufficient storage due to lack of investment in their states. To provide incentive, water has to be considered as a trading commodity like electricity and other raw materials and the beneficiary states will have to be asked for paying the price of water possessed legally by the surplus states. Is it desirable to bring water from state subject to central subject and finally privatise it as is being done in the case of public sector undertakings now-a days ?

Interstate Dispute

In almost all the projects executed in the country so far, water of a river basin has been shared only by the riparian/basin states. The proposed scheme envisages transfer of water from surplus basins to drought prone basins irrespective of whether they are riparian/cobasin or not . Recently, the country has witnessed bitter quarrel and animosity amongst the states of Karnataka and TamilNadu over the sharing of water from rivers Kaveri and Krishna, even though both the states are riparian. One can well imagine the degree of complexity and the dispute that will arise over sharing of water from the proposed scheme where a large numbers of states are involved, resulting in tension and rivalry amongst the people of different states. Who is going to control and operate this mega project?

Resistance of People in the East and North-East

Most of the surplus water lies in the east and North-East states where people are economically backward mainly due to lack of investment. People may resist inter- basin transfer of their water resources free of cost to the beneficiary states unless the Govt. of India bring their economic condition at par with other developed states of the

country. Equity in economic development is no less important than equity in water distribution for a healthy and prosperous nation. There is a massive unemployment and unrest amongst the unemployed youths in these states. Unless the Govt. addresses these problems first by taking up those components of the project e.g.inbasin development of hydro-power, irrigation, flood control, inland waterways, communication and development of other infra-structures for these states, it may be almost impossible for the project authorities to implement the proposed national water grid, however well planned it may be.

Poor Performance of Many Exiting Projects

It is extremely important to evaluate and improve the performance of the existing river valley projects and address the genuine problems being faced by the people especially those who are affected and who oppose river valley projects for fear not unfounded. Performances of many of the projects are not satisfactory [11]. About 70% of irrigation water is wasted due to improper maintenance, lack of proper co-ordination between users and controlling authorities, mismanagement of water at farm level, wrong and unrevised pricing policy etc. Almost one third of the irrigated land is subjected to water logging and salt problems. Farmers of Punjab state are not allowing completion of Sutlej- Yamuna river link while half of the project is already completed by the Haryana Govt. long back and the entire investment is lying idle. The Punjab farmers are resisting mainly due to their fear of water logging and salinity experienced by them from Bhakra- Nangal scheme. Teesta barrage irrigation project in the northern part of West Bengal is half completed even after 30 years from its start due to lack of funds. One of the DVC main canals which was designed for inland navigation has not carried a single vessel so far inspite of large investments and wastage of prime agricultural lands which had to be occupied for the construction of the wide canal. The state of Kosi canals and the problems being faced in river training after construction of Kosi barrage [12]) and Farakka barrage [13] are well known. These are only a few examples to illustrate the utter mismanagements in water sector. Many such projects which were earlier considered to be national assets have now become national liabilities. Unless and until we can correct the situation and improve the performance of these projects, it will be very difficult to earn people's confidence and convince the people for implementing a massive programme like national water grid ,however justified it may be.

Poor Economic Return & Faulty Pricing Policy

Unlike other commodities, water for irrigation is currently distributed almost free of cost. The present irrigation water rates are extremely poor and the realization of even those low rates is still poorer. Whereas during the British days, 87% of the rates used to be realised from users, today the revenue receipt has come down to 15% only [14]. As a result, there is hardly any maintenance of the irrigation projects after their execution. There is tremendous wastage of water due to losses in conveyance and operation as well as in the farms since farmers get it almost free of cost. Presently, the overall irrigation efficiency of most of the surface irrigation schemes which consume about 80% of our total water supply, is about 30% only. Should we build such things which we can not maintain?

The savings of water due to even a marginal improvement in irrigation efficiency and use of return flow through scientific management of irrigation water may be sufficient to irrigate the additional areas for increased food production. It will be wise to charge the beneficiary states for the water they will receive and pay a part of the revenue to the donor states as a price of the water they legally posses. The present practice of distributing irrigation water almost free of cost must be abandoned and the water rates so fixed that the revenue realized could pay for at least the annual maintenance and overhead costs if not the annual depreciation, interest on borrowed capital and the amount to be paid to the donor states.

Possible Climatic Changes

In an article published in Hindu, 26 th August, 2005, consequences of the proposed interlinking on south-west monsoon has been discussed .In the article, the inter-relation between the reduction in fresh run-off to Bay of Bengal (due to transfer of water from rivers discharging in Bay of Bengal), estimated as 4700 km^3 and 3000 km^3 from direct rainfall and run-from the rivers respectively, have been examined by the earth scientists in a one day seminar. The estimated loss in evaporation is about 3600 km^3 annually. Thus the total fresh water inflow into BoB exceeds evaporation loss. Once fresh water is transferred (estimated as 200 Km^3 annually), scientists are of the opinion that it is likely to increase salinity of top layer of BoB resulting in decrease of circulation of water from BoB ti Indian ocean which will affect the south-west monsoon.

RECOMMENDATION OF NCIWRD

The National Commission on Integrated Water Resources Development (NCIWRD) has projected the improved irrigation efficiencies of the surface and groundwater irrigation system for the future. The Commission also assessed the return flow from the various uses, which would flow into the hydrologic system and thus make it available for reuse. The Commission recognized that inter-basin transfer of water is an outstandingly large complex programme of water management. Studies have to be done with the help of computer simulation models and

systems analysis. They recommended that with improved management and inbasin development, there would be no major water scarcity problem up to the year 2050, except a few isolated pockets for which short links may be provided and there is no need of long distance water transfer at present.

CONCLUDING REMARKS

Under the above circumstances, it will be wise not to hurry for interlinking of the rivers in the first phase of development but to keep it as a long-term goal. The immediate need is to examine the feasibility of the river links and other alternatives to interlinks with more data and sound economic analysis of cost- benefit of different alternatives to achieve the same objectives. A master plan should be prepared adopting a strategy of implementing the different components of the master plan (including river-linking) in a phased manner so that the immediate problems of the donor states are given the topmost priority for their economic upliftment. The inbasin development of water resources should be taken up first before execution of interlinks for inter-basin transfer of surplus water to the drought prone areas in the last phase of the plan.

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