

INTERLINKING OF VAIGAI RIVER WITH KOWSIGANATHI AND VAIPPAR RIVER

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Abstract : Tamil Nadu is one of the drier states in India which depends heavily on water from the rivers originating from the neighboring states of Kerala and Karnataka. Inter basin water transfer can be a powerful tool to minimize the scarcity of water and regional imbalance in the supply and demand of water. Surplus water which flows waste to the sea would be fruitfully utilized.

River Linking is a project of linking two or more rivers by creating a network of manually created canals, and providing water to the land areas that does not have river water access and reducing the flow of water to sea using this means. It is based on the assumptions that surplus water in some rivers can be diverted to deficit rivers by creating a network of canals to interconnect the rivers.

This scheme is proposed to divert the surplus flood draining from Ramanathapuram big tank into Kausiganathi, Arjunanathi and Vaippar river through the Thirumangalam main canal. This flood carrier traverse in a drought prone area like Andipatti, Usilampatti, Kuppanampatti, Sedaipatti, Peraiyur, T.Kallupatti, Villur, Pudupatti, Vadamalakurichi, Sivagnanapuram, Virudhungar, Kullusandai, Golwarpatti, Nathathuppatti, Irukkankudi etc which are water scarcity area even for drinking for human and domestic, industrial use etc.

Keywords — NWDA (National Water Development Agency), Tank, Reservoir, Canal.

INTRODUCTION

Water for food : Water is one of the basic elements that sustains life on the earth, next to air, water is indispensable and every living that breaths and grows requires water: water is the first requirement for the growth of food for the living beings on the earth.

Nature has of course endowed with large volume of water in various forms the rivers and lakes, in the snow peaks and ice bergs and also in the vast oceans. But 95% of these large volumes is saltish. Out of the 5%, fresh 4 lies frozen in the polar regions leaving only 1% to be really useful for mankind. This water is again travelling in different forms in the hydrological cycle. The large mass of it is however is not actually moving in this cycle in this cross transfer. Only a small port of it is travelling up by evaporation, condensing to fall on ground as precipitation and runs off or infiltrates into the

ground to add to fresh water stronger precipitation is the main source of water for our use on earth.

Human needs of water spreads over irrigation requirements for growing food, hydropower uses for producing energy, industrial uses, drinking water and other domestic consumption. Among all these water used for irrigation is the largest in quantity. Since the natural precipitation is not uniformly distributed in space or time we have to resort to artificial supply of water for plants to ensure cropping and yield. With the growth in population man has to develop more and more of area for cultivable purpose. The extent under food crops is continuously increasing. Yet is not possible to ensure irrigation for the entire cultivable area for various reasons, geographical, hydrological etc.

Any how precipitation is the only source of all usable water an earth. The most easily tapped portion of this precipitation is the surface flow. We have harnessed most of the surface flow by constructing Anicuts Dams reservoirs. We have yet about 65 million hectare of surface water potential to be utilized most of them in the large rivers like Godawari, Krishna, Narmada etc. Now the governments has formed National Water Development Agency (NWDA) to quantity and judicially used surplus water to the needy place.

With the River Basin plans mad out, it is possible to identify the surplus and deficit basin. Based on the decision on priorities the NWDA has provided transfer of water from a surplus basin to an adjacent deficits basin.

Inter basin transfer of water was first effected in the country is the Periyar project executed in 1890's through which the surplus water of the basin of River periyar flowing west were diverted to the east flowing river vaigai.

In the III-rd five year plan, another major effort to inter basin transfer was made through the Parambiklam, Aliyar project, a multi-valley moldy purpose venture. The flows through Nirar sholayar and Parambikulam, the west flowing streams of Chalakudi basin are interlined, through a chain of storages and tunnels and one carried to the east of the western ghat, to combine with the flows of Aliyar and palar to serve a large ayacut in the Coimbatore District.

NEED FOR INTERLINKING OF RIVERS

India's water resources are having unever distribution in space and time leading to floods and droughts.

Interlinking of Indian rivers so as to reduce the miseries of the flood and drought has been considered since independence. The notable proposals are those of Dr.K.L.Rao and capt Dastur. Recent proposals and

those from the National Water Development Agency (NWDA)

The NWDA proposals envisage two components.

- a) The Himalayan Rivers components and
- b) The peninsular rivers components.

The interlinking of Himalayan Rivers components involves the consent and co-operation of neighbouring countries and may take longer time to realize.

The peninsular Rivers component envisages transfer of surplus waters of Mahanadi to Godavari – Krishna – pennar – Kaveri – Vaigai - Gundar. Since there is a need for consensus and co-operation of the states to share the water, no time frame for realizing the project is possible at present juncture.

These constraints have led to considering Intra basin water transfer within the state so that the problems of shortage and surplus are managed locally and quickly. Further there are possibility of some more Inter basin transfer which can be effected by mutual co-operation among the villages in Tamil Nadu.

Tamil Nadu River Basin : There is a variability in time and space in the distribution of rain fall and also the terrain is uneven. The western region of the state receives rainfall predominantly during the south west monsoon period and the coastal region receives rainfall predominantly during the North East monsoon period. The flat terrain and proximity to the coast precludes the possibility of surface storage in large scale in the Eastern Region due to vast areas of inundation.

Rainfall variability of Tamil Nadu :

The rainfall in the state fluctuates from region to region and year by year. The distribution and variability of rainfall in Tamil Nadu are quite significant. Rain is not evenly spread throughout the year, but is, concentrated, on an average of rainy days each during south west and North East monsoons. Variation in rain fall are significant with in the North East monsoon being considerably more erratic than that of the South West monsoon. But at the same time, there are always the upstream down stream problems associated with sharing of water as the upstream population is always vulnerable. To manage the worst situation, the main tanks that need to be talk about the inter/intrabasin water transfer has to be analysed as detailed below.

- a) Identify the surplus flood waters in each of the river basins.
- b) Possibility of using tanks for storage and hence recharge the ground water from basin to basin water shed to watershed should be kept in mind.

National Water Development Agencies (NWDA) : This organization belong to central government. Considering the about facts and figures the National Water Development Agencies (NWDA) has developed number of proposals under the guidance of central government and in which the following proposals are fully related to Tamil Nadu (fig-A)

- a) Link No 8 – Pennar (Somasila) – Palar – Cauvery (Grant Anicut)

- b) Link No 9 – Cauvery (Kattalai) – Vaigai – Gundar and

- c) Link No 16 – Pamba – Achankovil - Vaippar

Based on the above link, the public works Development of Tamil Nadu Government have identified the following there link and prioritized among them as item No I & 2 are in active consideration. The third item of diversion of flood waters of Tamiraparani river to Karumeriyar and Nambiyan link work has been started already Rs, 206 crores of Rupees have been spent out of 369 crocs.

- 1) Linking of cauvery with Agniar, south velar, Pambar, Kottakariyar, Vaigai and Gundar
- 2) Linking of Pennaiyar river with cheyyar River
- 3) Formation of flood carrier canal from Kannadian channel to Drought prone area of Sathankulam, Thisaiyanvilari by interlinking Thamiraparani, Pachaiyar, Karumeniyar and Nambiyar river in Southern District of Tamil Nadu.

Similarly the Govt of Tamil Nadu have approced the proposal (b) ic the Cauvery – vaigai – Gundar by constructing an Ancient across the river Cauvery near kattalai ad taking the flood water about to Gundar through a lined canal to a length of 255 km by the way of Trichy, Pudukottai and tails @ the upetrem of Parthibanur regulator which is the III-rd reach of Vaigai project (Parthibanur to Ramnad big tank is III-rd each) to supplement the existing Vaigai Agacut

System Description

River Vaigai

Rive Vaigai originates from the Varusha Nadu hills within the erstwhile Gandamanur Zamindari limits at an altitude of 1525 in above MSL. Three tributaries, Palar, Periyar and Koraliar join the river in the hilly reaches. After running in a North Easterly direction for a length of 64km through Gandamanaickanur and Srivilliputhur reserve forests, the river enters the plains. The rivers suriliar and Theniar which orginates from the Western Ghats ad pass through the cumbum valley join with the Vaigai in the plains. Another tributary, Varahanathi originating from Palani hill also joins this river 20km below Suriliar confluence. The river Vaigai flows through Madurai, Thiruppuvanam, Manamadurai, Paramakudi and Ramanathapuram and finally empties itself into Ramanathapuram bigtak, then the surplus of this tank goes to gulf of Mannar. It travels a total distance of 250km till it falls into Ramnad big tank.

Irrigation under vaigai system was developed by Pandia kings and later by the Sethupathies of Ramanathapuram zamindary. Prior to the construction of Periya Dam, irrigation under vaigai river system was a run of the river system augmenting the flash flow of the river through open off tanks channels. They had been excavated to feed tanks outside the basin wherever the level permitted. The number of tanks was about 3,000 and their total capacity was sufficient enough to also the total run of the basin with about two fillings.

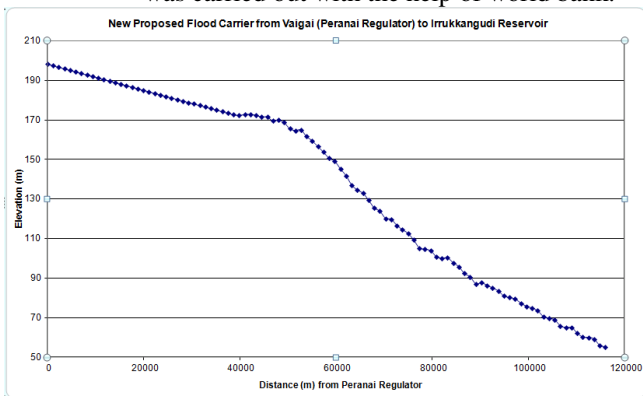
On the whole the vaigai system a model to show the world, how a river basin in an arid region has been meticulous planned.

Irrigation Development

There is a need for increasing the food production due to the population growth. According to the necessity developmental activities were taken up by the Govt.

So the irrigation development under Vaigai river system had under gone many changes. It can be classified into Six stages as given below.

- i) Prior to construction of Periyar Dam (upto 1895)
 - ii) After construction of Periyar Dam and before construction of Vaigai Dam (1895 to 1955)
 - iii) After construction of Vaigai Dam and subsequent developments (1955 to 1970)
 - iv) Modernisation of Vaigai Channels (1970 to 1979)
 - v) Creation of new storages ad addition of new command area above virahanur regulator (1980 to 1994)
 - vi) Water Resources Consolidation Project (WRCP) after 1994 to till date)
- i) Prior to constitution of Periyar Dam, the flood flow in the river Vaigai was good (ic) in the year 1850-51 to 1888-89 (27 years) the system behaved 20 years well 20 out of 24 years with 83% success (Statement - I)
 - ii) After constitution of Periyar Dam and extending the supply through main canal, the system also behaved well in 15 years out of 27 years with 55% success during the year 1908-1909 to 1934-1935 (Statements II)
 - iii) After constitution of Vaigai Dam additional command area of 5529 Ha Ayacut was developed through Tirumangalam Main Canal (TMC) to feed water to Usilampatty and Tirumangalam Taluk.
 - iv) Then, modernsation of Periyar Vaigai system was carried out with the help of world bank.



The main objectives of the project were

- i) To conserve water by improving the conveyance efficiency and operational efficiency by lining the entire conveyance system. Thus saved water has been used for extending the additional Ayacut.
- ii) To enhance the crop production.
- iii) Equitable water supply etc

After modernizing the entire system (ic) up to Parthibanur regulator and its supply channels were also formed on both side of left & right side below Parthibanur regulator was designed to carry 1800 caser (50 942m²/se) on the left side ad 1700 caser (48.11m²) see on the right side. The flow diagram of channels and Anicut, capacity dewfalls of Parthibanur is presented as tab 1.1

After modernizing the TMC, the TMC was also extended up to Kalappanpatti Tank. The present flow going to sea as water has been studied by Anna University and they have given their findings as below.

The Anna University in their then consultancy study report mentioned that the flows going to sea as waste has been found out by analyzing the flows at annual level were analysed for the period 1977-78 to 1992-93 and the annual flows gives as waste in 50%, 75% and 90% in the year respectively is 01.75, 34.76, & 10.99 mm³. (Comprehensive system study of Vaigai river basin WAP COS 1995).

During this year (November 2015) we3 expressed with unpredicted rain fall in Tamil Nadu and we are not having enough places to capture the excess flow which gone to sea as waste, and hence as per the policy of state Government t first we go for harvesting the flood flow in this the state first so, this new scheme is framed as below.

OBJECTIVE OF THE SCHEME:

This scheme is proposed to divert the surplus flood draining from Ramanathapuram big tank into Kausiganathi, Arjunanathi and Vaippar river through the Thirumangalam main canal (TMC) by increasing the carrying capacity (up to 28kms) and excavating a new flood carrier from L.S.28th km of TMC (near Kalappanpatti tank) for 21 km up to Goundanathi where the Thervankurichi Anicat is exist. From this Anicut the flood water is taken to Thevankurichi Tank Vannivelampatti through the existing supply channel, and then from the tank, flood water is taken through the existing channel via T.Kallupatti, Pudupatty to Vadamalaikurichi tank. From Vadamalaikurichi tank, the surplus flood water is taken through the existing Kowsiganathi to Kullursandai Reservoir and them to Golwarpatty Reservoir finally tails into Irukkankudi Reservoir. These flood carriers traverse in the Taluk of Usilampatty, Peraiyur, Virudhunagar, Sattur of drought prone areas by fulfilling the drinking water problems also in these area.

WHY WE NEED THIS PROJECT:

This flood carrier traverse in a drought prone are a like Andipatti, Usilampatty, Kuppanampatti, Sedaipatti, Peraiyur, T.Kallupatti, Villur, Pudupatti, Vadamalakurichi, Sivagnanapuram, Virudhungar, Kullusandai, Golwarpatty, Nathathuppatti, Irukkankudi etc which are water scarcity area even for drinking for human and domestic, industrial use etc.

In the head reach of the project i.e. up to Kuppanapatti (upto Kalappanpatti tank) regulated water has been supplied through TMC, apart from this to tail end of this project (i.e) up to Irukkankudi, everybody relies on only rainfall. The rain fall in these area is now a days below normal and also in erratic. So the peoples are suffering for want of water for irrigation, drinking, domestic industrial purpose, etc.

Normally there is a trend in the public to migrate from their native to some other places for their survival, but the peoples in these areas are fighting with the nature for their livelihood, even though there is short of water even for drinking.

So, for better water management, and also to save the human beings and animals the water found surplus (as stated below) in a basin may be transferred to deficit basin and thus the flood goes to the sea as waste can be diverted to this proposed area through a better management of water and thus the peoples in that area may be saved from migration.

FLOOD FLOW INTO THE SEA AS WASTE BELOW PARTHIBANUR REGULATOR.

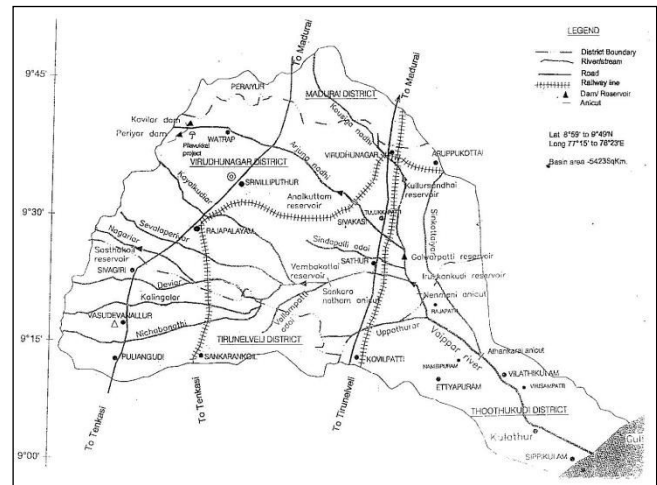
Government of Tamilnadu, Public works Department has entrusted the work of “Comprehensive system study of Vaigai River Basin” to water and power consultancy services (India) limited (WAP COS) during 1995. This organization is an International consultancy in water Resources and they are stationed at New Delhi – 110 001, India.

WAPCOS has carried out the study of Vaigai River Basin by Zonalyzing the entire reach into five zones as shown below.

- | | |
|---------------------------------------|----------|
| 1) Periyar - Vaigai Dam | Zone I |
| 2) Vaigai Dam - Peranai | Zone II |
| 3) Peranai - Virahanur regulator | Zone III |
| 4) Virahanur to Parthibanur regulator | Zone IV |
| 5) Below Parthibanur regulator to sea | Zone V |

They have studied in depth in various heads such of them are, river release, catchment yield of river, surplus of system and non system tanks, return flow, Domestic and Industrial requirement and river loss etc and they have established the quantum of flow going as waste into sea at different depend abilities, at the end of the Zone V i.e. to sea. The flows at annual level where analyzed for the period 1977-78 to 1992-93 and the annual flows going as waste in a50% 75% and 90% year are respectively 81.75, 34.76 and 10.99 mcft. Thus they have established that a sizable quantum of water has been gone to sea as waste. This result of the analysis has been established by the PWD by actual gauging of the flow during the flood season at Ramnad Big tank. The statement has been prepared for 14 years. Which gives the surplus details of Ramnad big tank and falling shutter Anicut (statement – I). From the statement the average flood flow into the sea as waste as 7443.35 mcft has been arrived. From this waste at least 2500 mcft of flood water may be diverted to the drought prone area,

where the water shortage is very acquit like Usilampatti Taluk , Peraiyur Taluk, T.Kallupatty, Virudhunagar, Sattur etc.



As per the WAPCOS study final report, sizable quantum of water has been goes to sea as waste and also actual gauging in Ramnad big by the PWD has also proved that about an average of 7443 mcft of water is goes to sea as waste.

Through there is a falling trend of rainfall in general, it should not lead to the impression that the flood hazards are not going to be faced. On the contrary, there may be more serious flood problems, as the phenomenon of floods and flood hydrology concepts are very typical and depend upon the short term distribution of rain fall.

Apart from the vaigai release to Zone V, It gets additional flood water as per the new proposal prepared by the NWDA (i.e) the feasibility report prepared by NWDA deals with the Cauvery-Vaigai Gundar link project, which is an integral part of the Mahanathi-Godavari – Krishna – Pennar – Cauvery – Vaigai Gundar Peninsular river link system formulated for inter basin transfer of water from surplus river basin to deficient basins. (vide Fig – I)

The Cauvery – vaigai – Gundar link project envisages diversion of 2252 Mm3 of water from Kattalai barrage proposed by NWDA at a location downstream of the existing Kattalai bed regulator across Cauvery river, through the link canal and this has also taken up by the Government of Tamilnadu Hon’ble Chief Minister of Tamilnadu has also requested the Central Government to allot the fund for early execution of this scheme.

This link canal traverses through Karur, Trichy, Pudukottai, Sivagangai, Ramanathapuram, Virudhunagar District, (Kariyapatti Taluk) and Thoothukudi District of Tamilnadu and finally tails into Parthibanur regulator with a designed discharge of 2252 mm3 (for irrigation 1952, Domestic industrial 185 mm3 with Transmission loss of 115 mm3.)

From this it is evident that the vaigai Zone V (i.e) below Parthibanur regulator, is getting sufficient

quantity of flood water from Cauvery – Vaigai Gundar link in addition to its original flood from Vaigai.

So after fulfilling the needs of the vaigai ayacut in Zone V (i.e) below Parthibanur regulator as per the actual gauging 7443. 45 mcft if water is going into the sea as waste during rainy season. From this surplus, it is proposed to divert about 2500 mcft of water into drought prone areas like Usilampatti, Sedapatti. Peraiyar, T. Kallupatti, Vadamalakarichi, Virudhunagar, Golwarpatti, Irukkankudi by utilizing the existing TMC, Thevankudi anicuts and its supply channel & Kowshikanathi etc.

COMPONENT OF THE SCHEME:

- Improving the existing Thirumangalam main canal and its head sluice.
- Increasing the carrying capacity of existing TMC from 210 cusecs to 2500 cusecs by widening, lining and strengthening the banks up to (28.03 km) up to Kalappanpatty Tank
- Excavation of a new flood carrier canal from the Tailend of TMC to the Goundanathi where in which Thevankurichi Anicut is constructed for the inter trans basin of Goundanathi to Kowshikanathi for a length of 21 km.
- From Thevankurichi Anicut to Thevankurichi Tank there is supply channel for a length of 10.5 km is exist, it has to be strengthened.
- From Thevenkurichi tank, there is a flood surplus odai is running through T. Kallupatti to Vadamaliaikurichi tank and it has to be strengthened.
- From Vadamalaikurichi Tank to Kullursandai reservoir, Kowshika nathi is running and it has to be re-shaped.
- From Kullursandai reservoir there is a surplus odai which goes to Golwarpatti reservoir can be used as a flood carrier.
- The Surplus of Golwarpatti reservoir goes to Irukkankudi reservoir through Arjuna river after travelling 4km it falls into the reservoir. (Irukkankudi)

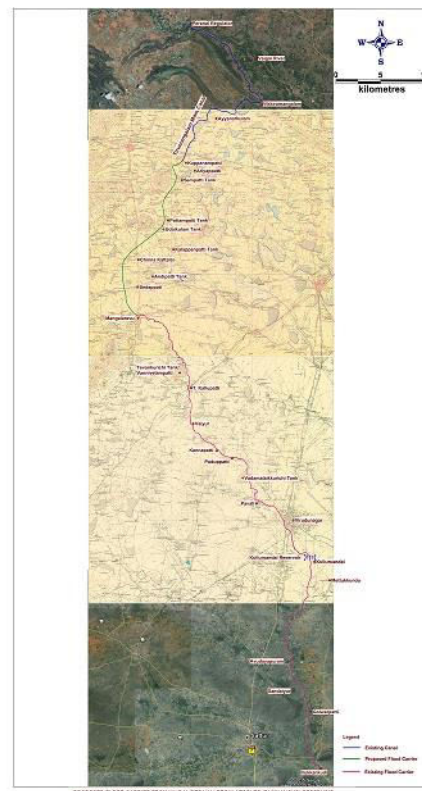
Presently, the flood water received from Goundanathi which is diverted through Thevankurichi Anicut is feeding number of tank through their supply channels before it reaches Thevankurichi tank. Similarly, the flood flow from Thevankurichi Tank also Feeds number of tanks on the way before it reaches vadamalakarichi tank, through their independent supply channels to each of the tanks in the Kowsiga Basin.

The surplus water from Vadamalaikurichi tank goes to Kullursandi reservoir, and its surplus goes to Golwarpatty reservoir and finally empties into Irukkankudi reservoir

By implementation of this scheme Madurai , Virudhunagar and Thoothukudi District will be Benefitted through 100 tanks and Reservoirs with on extant of 43040 AC (Vide Statement 1) of lands and the above three district will be brought under cultivation

LAND ACQUISITION :

For item Nos. (a), (b) Requires some land for widening. for item (c) requires new land as per the design to be acquired, and for item (d) to (g) the land acquisition not at all necessary. The existing canal and the Kowsiganathi can be utilized without acquiring any further land, and if at all requires that can be acquired under private negotiation basis



COST OF THE SCHEME :

This can be arrived at after completing the, Detailed Project Report (DPR) and the rough cost of the scheme in 600 corers

Conclusion

It is a complex and complicated issue that requires comprehensive and unconditional professional assessment and analysis for all the stages of its implementation. The impact of such a grand scheme is irreversible; therefore it requires a very delicate approach. It revolves around the complications developing in the area of federalism or simply challenging the principles of Indian federalism. It finds that in the Indian Constitution water is in the State List while intra-state river is in the Union List and taking up such a mega RIL project in the states is acceptable

BENEFIT OF THE SCHEME :

- 1) The water scarcity of the Usilampatti, Peraiyur, T.Kalluppati, Villur, Vadamalalurichi, Virudhunagar, Sattur, Irukkankudi and other villages located on the way will be fulfilled.
- 2) The Requirement of deficit basin and its sub basin will be fulfilled.
- 3) Ground water level will be raised and thus well water irrigation can be carried out effectively.
- 4) Part of unused Ramanathapuram big tank surplus water which goes to sea as waste will be utilized.
- 5) Dry crop area can be converted as wet crop area and thus civilization of peoples in these area will be changed

SPECIAL FEATURES OF THE SCHEME :

The Proposal is to divert 2500mcft of surplus water of vaigai river from its average annual surplus quantum of 7443.45 mcft which goes to sea as waste. The flood carrier has to be designed to rush supply with a carrying capacity of 2500 mcft from TMC at vaigai river without affecting the riparian rights of the lower down Ayacutdhars

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REFERENCES

- (1).BandyopadhyayJayanta, (2012), "Water Science in India HydrologicalObscurantism", Economic and Political Weekly, Vol.67 No.16.
- (2).BandyopadhyayJayanta and ShamaPerveen, (2004a), "Interlinking of Rivers in India: Assessing the Justifications", Economic and Political Weekly, Vol. 39 No. 50
- (3) Mishra Dinesh Kumar, (2012), "Resuscitating a Failed Idea Notes from Bihar", Economic and Political Weekly, Vol.67No.16.
- (4) IyerRamaswamy R., (2012k), "River Linking Project A Disquieting Judgement", Economic and Political Weekly, Vol.67 No.14
- (5) McNeely, J. (1999) 'Freshwater management: From Conflict to Cooperation' (Gland, IUCN). (<http://www.iucn.org/bookstore/bulletin/1999/wc2/content/conflict.pdf>)

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