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# INTERLINKING OF RIVERS

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**INTERLINKING OF RIVERS**



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The River Interlinking project is a proposed mega project in India which aims to efficiently and effectively manage available water resources in India by linking rivers using a network of reservoirs and canals to enhance irrigation and groundwater recharge, reduce persistent floods in some parts, and water shortages in other parts of India.

It is considered as a solution for growing needs of water for a geographical region with 18% of world's population and only 4% of water resources.

### **RATIONAL BEHIND RIVER INTERLINKING**

- India also sees years of excess monsoons and floods, followed by below average or late monsoons with droughts.
- The average rainfall in India is about 4,000 billion cubic metres, but most of India's rainfall comes over a 4-month period – June through September. Also, the rain across the nation is not uniform.
- This geographical and time variance in availability of natural water versus the year-round demand for irrigation, drinking, and industrial water creates a demand-supply gap.
- This gap can be bridged by **transfer of water** from **water 'surplus' basins** (perennial Himalayan rivers) where there is flooding to **water 'deficit' basins** (rain-fed peninsular rivers) where there is drought/scarcity, through inter-basin water transfer projects.
- Hence, the **National River Linking Project (NRLP)** is claimed to be the answer to India's water problem through conservation of the abundant monsoon water, store it in reservoirs, and deliver this water using rivers interlinking project to areas and over times when water becomes scarce. Beyond water security, the project is also seen to offer potential benefits to transport infrastructure through navigation, as well as to broadening income sources in rural areas through fish farming.

## INTERLINKING OF RIVERS: A BRIEF HISTORY

- Under the Periyar Project, transfer of water from Periyar basin to Vaigai basin was envisaged. It was commissioned in 1895.
- The idea of interlinking rivers was first mooted by Sir Arthur Cotton, the Chief Engineer of the Madras Presidency.
- This idea was revisited in 1960 by the then Minister of State for Energy and Irrigation, K L Rao, who proposed to link rivers Ganga and Cauvery.
- The National Water Development Agency (NDWA) was established by former Prime Minister Indira Gandhi in 1982. It got a push in **1982 when NWDA was established**. However, not much progress was made later.
- In 2002, the Supreme Court asked the government to finalise a plan for interlinking rivers by 2003 and execute it by 2016. In 2002, it got a huge fillip when the government decided to study the feasibility and devised a concrete layout to implement it. However, with the change in government the project was put on hold owing to inter-state disputes and opposition from farmers, tribal groups, civil society and environmentalists.
- A task force was formed by the government for the same in 2003.
- In 2012, the SC again asked the government to start the project. The Supreme Court directed the Ministry of Water Resources to constitute an experts committee to pursue the matter with the state governments. However, it left the implementation of the project on centre's discretion citing it to be the executive's purview.
- In 2014, the Ken-Betwa River Linking Project got Cabinet approval.
- The new government is keen to carry forward the project. The linking of Godavari and Krishna was completed in 2015.
- In March 2021, the governments of Uttar Pradesh and Madhya Pradesh signed an agreement that nudged forward the long-stalled multi-crore, controversial project to link the Ken and the Betwa rivers.

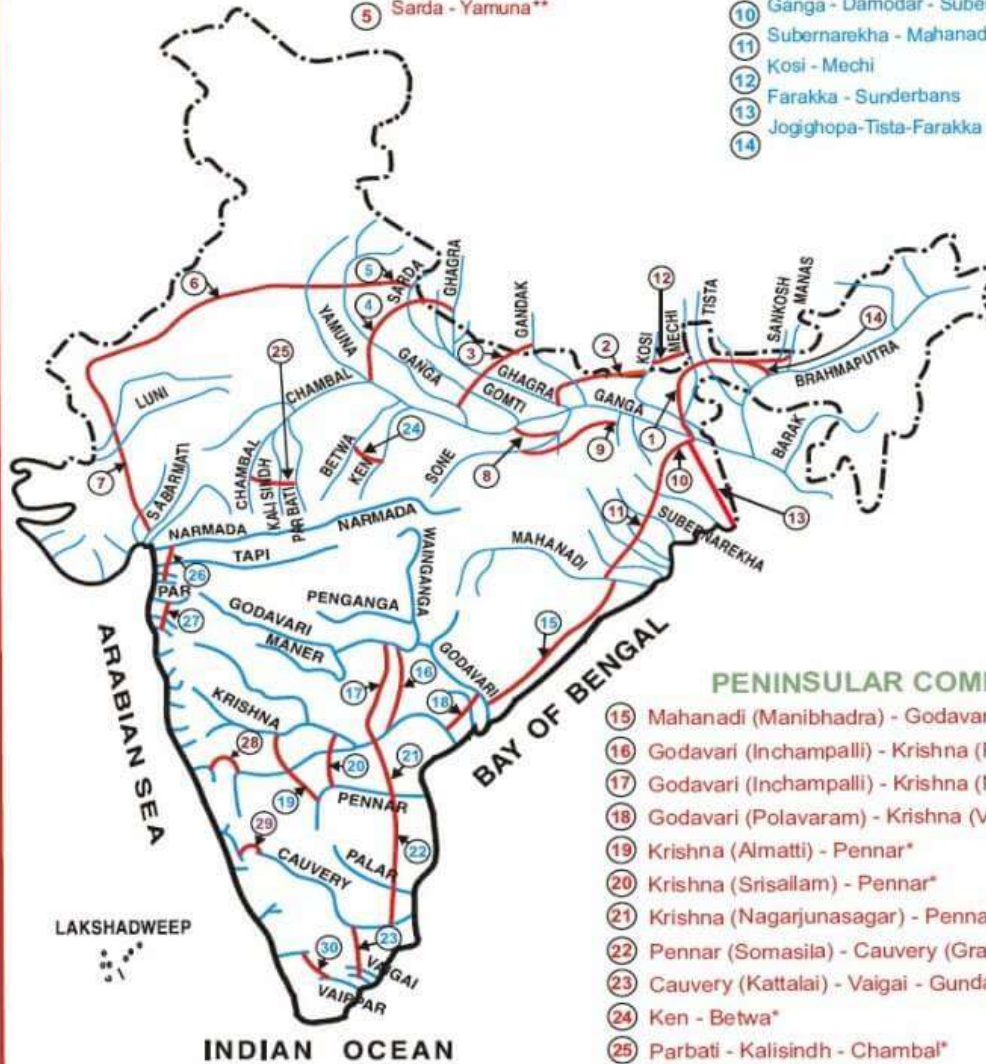
## NATIONAL RIVER LINKING PROJECT

- NRLP, formerly known as the National Perspective Plan, proposes to connect 14 Himalayan and 16 peninsular rivers with 30 canals and 3,000 reservoirs to form a gigantic South Asian Water Grid.
- NRLP includes two components:
  - **Himalayan component:** This component aims to construct storage reservoirs on the Ganga and Brahmaputra rivers, as well as their tributaries in India and Nepal. It will connect, 1) the Ganga and Brahmaputra basins to the Mahanadi basin, and 2) the Eastern tributaries of the Ganga with the Sabarmati and Chambal River systems.
  - **Peninsular component:** It includes 16 links that propose to connect the rivers of South India. It envisages linking,
    - the Mahanadi and Godavari to feed the Krishna, Pennar, Cauvery, and Vaigai rivers,
    - the Ken River to the Betwa, Parbati, Kalisindh, and Chambal rivers
    - West-flowing rivers to the south of Tapi to the north of Bombay, and
    - Linking some west-flowing rivers to east-flowing rivers.
- The NRLP is managed by the **National Water Development Agency (NWDA)** under the **Ministry of Jal Shakti**. NWDA was set up in 1982, to conduct surveys and see how feasible proposals for interlinking river projects are.
- Recently a National River Interlinking Authority

# PROPOSED INTER BASIN WATER TRANSFER LINKS

## HIMALAYAN COMPONENT

- |                             |  |
|-----------------------------|--|
| ① Manas-Sankosh-Tista-Ganga | ⑥ Yamuna - Rajasthan                         |
| ② Kosi - Ghagra             | ⑦ Rajasthan - Sabarmati                      |
| ③ Gandak - Ganga            | ⑧ Chunar - Sone Barrage                      |
| ④ Ghagra - Yamuna**         | ⑨ Sone Dam-Southern Tributaries of Ganga     |
| ⑤ Sarda - Yamuna**          | ⑩ Ganga - Damodar - Subernarekha             |
|                             | ⑪ Subernarekha - Mahanadi                    |
|                             | ⑫ Kosi - Mechi                               |
|                             | ⑬ Farakka - Sunderbans                       |
|                             | ⑭ Jogighopa-Tista-Farakka (Alternative to 1) |



## PENINSULAR COMPONENT

- |  |
|--|
| ⑮ Mahanadi (Manibhadra) - Godavari (Dowlaiswaram)*   |
| ⑯ Godavari (Inchampalli) - Krishna (Pulichintala)*   |
| ⑰ Godavari (Inchampalli) - Krishna (Nagarjunasagar)* |
| ⑱ Godavari (Polavaram) - Krishna (Vijayawada)*       |
| ⑲ Krishna (Almatti) - Pennar*                        |
| ⑳ Krishna (Srisallam) - Pennar*                      |
| ㉑ Krishna (Nagarjunasagar) - Pennar (Somasila)*      |
| ㉒ Pennar (Somasila) - Cauvery (Grand Anicut)*        |
| ㉓ Cauvery (Kattalai) - Vaigai - Gundar*              |
| ㉔ Ken - Betwa*                                       |
| ㉕ Parbati - Kalisindh - Chambal*                     |
| ㉖ Par - Tapi - Narmada*                              |
| ㉗ Damanganga - Pinjal*                               |
| ㉘ Bedti - Varda                                      |
| ㉙ Netravati - Hemavati                               |
| ㉚ Pamba - Achankovil - Vaippar*                      |

\* FR Completed      \*\*FR Completed for Indian portion

## **BENEFITS OF INTERLINKING OF RIVERS**

- **Interlinking rivers is a way to transfer excess water from the regions which receive a lot of rainfall to the areas that are drought-prone.** This way, it can control both floods and droughts.
- India has a large-scale hydrological imbalance with an effective rainfall period of 28 to 29 days. Some regions receive very high rainfall while some face droughts. Interlinking would transfer the water from flood-prone regions to drought-prone regions.
- This will also **help solve the water crisis** in many parts of the country.
  - The project envisages a supply of clean drinking water amounting to 90 billion CBM (Cubic Metre). It can resolve the issue of drinking water scarcity in India.
  - interlinking of water also provides **water for industrial use** amount to 64.8 billion CBM
- The project will also **help in hydropower generation.** This project envisages the building of many dams and reservoirs. This can generate about 34000 MW of electricity if the whole project is executed.
- The project will **help in dry weather flow augmentation.** That is when there is a dry season, surplus water stored in the reservoirs can be released. This will enable a minimum amount of water flow in the rivers. This will greatly help in the control of pollution, in navigation, forests, fisheries, wildlife protection, etc.
  - interlinking can help the survival of **fisheries, protect wildlife in the summer months due** to water scarcity. It can also reduce forest fires occurring in India due to climatic conditions.
- **Indian agriculture** is primarily monsoon-dependent. This leads to problems in agricultural output when the monsoons behave unexpectedly. This can be solved when irrigation facilities improve. The project will provide **irrigation facilities** in water-deficient places.

- The interlinking of rivers has the potential to irrigate 35 million hectares of land in the water-scarce western peninsula. This will help India to create employment, boost crop outputs, farm incomes. Above all, the interlinking of rivers will make India a step closer to **achieving food security**.
- The project will also help commercially because of the betterment of the **inland waterways transport system**. Moreover, the rural areas will have an alternate source of income in the form of **fish farming, etc.**
- **Fulfil India's climate commitments: The interlinked rivers have the potential to generate a total power of 34 GW. This will help India to reduce coal-based power plant usage.**
- The project will also augment the **defence and security of the country through the additional waterline defence**.

### ISSUES WITH RIVER INTERLINKING

- **Project feasibility:** The project is estimated to cost around Rs.5.6 lakh crores (estimated cost with the base year of 2000). Additionally, there is also the requirement of huge structures. All this requires a great engineering capacity. So, the cost and manpower requirement is immense.
  - A report points out that Climate change will cause a meltdown of 1/3rd of the Hindu Kush Region's glaciers by 2100. So, the Himalayan rivers might not have 'surplus water' for a long time. Considering this, investing billions in the interlinking of rivers might yield benefits only for a short time.
- **Environmental impact:** The huge project will alter entire ecosystems. The wildlife, flora and fauna of the river systems will suffer because of such displacements and modifications. Many national parks and sanctuaries fall within the river systems. All these considerations will have to be taken care of while implementing the project. The project can



reduce the flow of fresh water into the sea, thus affecting marine aquatic life.

- **Impact on society:** Building dams and reservoirs will cause the displacement of a lot of people. This will cause a lot of agony for a lot of people. They will have to be rehabilitated and adequately compensated.
- **Controlling floods:** Some people express doubts as to the capability of this project to control floods. Although theoretically, it is possible, India's experience has been different. There have been instances where big dams like Hirakud Dam, Damodar Dam, etc. have brought flooding to Odisha, West Bengal, etc.
- **Political Challenges:** Water is a state subject in India. So the implementation of the NRLP primarily depends on Inter-State co-operation. Several states including Kerala, Andhra Pradesh, Assam, and Sikkim have already opposed the NRLP.
- **Inter-state disputes:** Many states like Kerala, Sikkim, Andhra Pradesh, etc. have opposed the river interlinking project.
- **International disputes:** In the Himalayan component of the project, the effect of building dams and interlinking rivers will have an effect on the neighbouring countries. This will have to be factored in while implementing the project. Bangladesh has opposed the transfer of water from the Brahmaputra to the Ganga.
- **Other Challenges:** The government is proposing a canal irrigation method for transmitting water from one area to the other. The maintenance of canals is also a great challenge; it includes preventing sedimentation, clearing logging of waters etc.

### WAY FORWARD

- **Integrated water resource management** is the key for India. **India needs to conserve every drop of water, reduce wastage, equitable distribution of resources at the same time enhances groundwater.**

So, the small-scale simple things have to be tried instead of large-scale projects.

- **Local solutions** (like better irrigation practice) and watershed management, should be focused on.
- **Efficient utilisation of existing resources: Integrated water resource management** is the key for India. Moreover, curbing demand by efficient utilisation of existing water resources should be prioritised before making big-ticket investments in river interlinking under NRLP.
- **Groundwater management is the key:** The focus of India's water resources should be about nurturing its Groundwater system. It would include identifying and protecting groundwater recharge mechanisms, enhancing recharge where feasible, installing artificial recharge and also regulating groundwater use at aquifer level.
- **The government should alternatively consider the National Waterways Project (NWP)** which "eliminates" friction between states over the sharing of river waters since it uses only the excess flood water that goes into the sea unexploited.
- The necessity and feasibility of river-interlinking should be seen on a case-to-case basis, with adequate emphasis on easing out federal issues.

The government has to conduct a detailed hydrological, geological, meteorological and environmental analysis of the interlinking of rivers and bring consensus among the states as well as affected people so that this ambitious project can be implemented with minimum concern.

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