

ADDRESSING WATER SCARCITY THROUGH RIVER INTERLINKING

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Water is the lifeblood of social and industrial progress, yet India faces a severe and escalating water crisis. Despite having 18% of the world's population, the country possesses only 4% of global freshwater resources, leading to a significant water imbalance. This challenge is further intensifying due to rapid urbanization, continuous population growth, rising industrial expansion, and climate change events, which impact rainfall patterns and resulting in water scarcity.

India is also the largest consumer of groundwater, extracting approximately 230 billion cubic meters annually. Groundwater supports over 60% of irrigation and 85% of drinking water needs, making it a critical resource. The unregulated extraction of groundwater has led to depletion and contamination of ground and surface water, worsening water stress and threatening long-term sustainability. Addressing this crisis requires sustainable water management, efficient usage, and policy interventions to ensure water resilience and sustainability for future generations.

Water scarcity is a major concern in India, impacting agriculture, industries, and human life. Despite having a vast network of rivers, the country faces an uneven distribution of water resources. While some regions suffer from devastating floods, others experience prolonged droughts. To address this imbalance, the initiative of river interlinking has been planned to manage water distribution efficiently.

RIVER INTERLINKING

River interlinking involves connecting surplus river basins with deficit ones through a network of canals,

reservoirs, and pipelines. This approach ensures that excess water from flood-prone regions is transferred to water-deficient areas, thereby mitigating both floods and droughts. The National River Linking Project (NRLP), initiated by the National Water Development Agency (NWDA), aims to redistribute water resources across the country. This ambitious initiative envisions connecting 30 major rivers categorized into Himalayan and Peninsular river links, through a network of approximately 15,000 kilometers of canals. The plan includes 30 links and 3,000 storage structures to transfer water from surplus to deficit regions.

River interlinking offers immense benefits, particularly in enhancing irrigation, water security, and economic growth. The project has the potential to bring 35 million hectares of additional land under

cultivation, significantly boosting agricultural productivity. By reducing dependence on unpredictable monsoons, it ensures a more stable and reliable water supply for farming and domestic use. The initiative can contribute to hydropower generation, with an estimated capacity of 34,000 MW, supporting India's renewable energy goals. It also plays a crucial role in economic development by stimulating agriculture, industry, and employment opportunities. Moreover, interlinked rivers can improve inland water navigation, leading to lower transportation costs and reduced fuel consumption, making logistics more efficient and environment friendly.

The Interlinking of Rivers in India is overseen by the National Water Development Agency (NWDA) under



the Ministry of Jal Shakti. The project is divided into three key components:

- 1. Himalayan River Interlinking:** Focuses on connecting rivers in the northern Himalayan region.
- 2. Peninsular River Interlinking:** Aims to interlink rivers in the southern peninsular region.
- 3. Intra-State River Interlinking:** Involves linking rivers within individual states to improve water distribution.

BENEFITS OF RIVER INTERLINKING

River interlinking project is one of India's most ambitious water management initiatives, aimed at addressing regional water imbalances. The major benefits of this project include:

1. Conservation of Water Resources: Surface water conservation management will receive a significant boost, leading to the revival of lakes, ponds, and rivers in arid regions. This will enhance surface water availability and reduce reliance on groundwater for irrigation and other purposes. The expansion of surface water resources will also increase the availability of arable land across the country.

2. Drought Mitigation & Flood Control: The project redistributes surplus water from flood-prone regions to drought-affected areas, ensuring more equitable water availability. It will also help manage excess water during monsoons, minimizing flood risks and reducing damage in vulnerable regions.

3. Crop Productivity: The interlinking of rivers can act as a saviour for agricultural areas. Agriculture mostly depends on the uncertainty of the monsoon so it will help a large number of farmers to rid of the challenges in diverse areas of the country. The project has the potential to enhance crop productivity by providing reliable water supply to arid and semi-arid regions, reducing dependency on unpredictable monsoons.

4. Drinking Water Supply: The project will increase potable water availability in water-scarce regions, effectively addressing water shortages and significantly improving public health and sanitation. It will further help in replenishing depleted water bodies, ensuring the long-term sustainability of surface water resources.

5. Water Transport System: Utilizing water as a mode of transport through river interlinking enables the efficient movement of heavy cargo, providing a cost-effective and sustainable alternative to road

SPML Infra Limited, ranked 14th among the World's Top 50 Private Water Companies by Global Water Intelligence (GWI), is a leading player in bulk water transmission, irrigation systems, and integrated water resource management, backed by decades of expertise in executing large-scale water infrastructure projects.

transportation. This interconnected waterway system promotes inland shipping, lowers logistics costs, boosts economic activity, and reduces pollution by cutting down fuel consumption and traffic congestion.

Apart from the above advantages, the project can contribute to hydropower generation, providing an additional 34,000 MW of electricity and boosting economic growth by stimulating agriculture, industry, and employment.

INDIA'S RIVER INTERLINKING PROJECTS

One of the most prominent river-linking projects is the Ken-Betwa Link, which connects the Ken River in Madhya Pradesh with the Betwa River in Uttar Pradesh. The Hon'ble Prime Minister of India recently laid the foundation stone for the Ken-Betwa River Linking Project, India's first interlinking of rivers under

the National Perspective Plan. The project aims to transfer surplus water from the Ken River to the Betwa River, benefiting the Bundelkhand region in Uttar Pradesh and addressing water scarcity and promoting sustainable development.

With an estimated cost of ₹44,605 crore, the project is set to provide irrigation for 1 million hectares of farmland across 2,000 villages, ensuring water security for farmers in Madhya Pradesh and Uttar Pradesh. It will also supply drinking water to 6.5 million people across 22 districts, significantly improving the region's water accessibility.

The project will also contribute to renewable energy generation, producing 103 MW of hydropower and 27 MW of solar power, supporting India's green energy initiatives.

Beyond water and energy benefits, the project is expected to create employment opportunities and strengthen the rural economy. By facilitating better

River interlinking projects have the potential to enhance irrigation, improve water security, generate hydropower, boost inland transportation, control floods, mitigate droughts, and drive economic growth.



irrigation, drinking water access, and sustainable energy production, the Ken-Betwa River Linking Project is set to transform Bundelkhand, opening new avenues of prosperity for the region.

Another crucial project is the Godavari-Krishna-Cauvery Link, which aims to address water scarcity and ensure equitable distribution across southern India. This project envisaged to divert 7,000 million cubic metres (MCM) of water annually from the Godavari basin to the Krishna, Pennar and Cauvery basins, benefiting the states of Tamil Nadu, Karnataka, and Andhra Pradesh. By diverting excess water from the Godavari, the project is expected to provide irrigation benefits to approximately 9.44 lakh hectares reducing dependence on erratic monsoons, significantly impacting the agricultural landscape of the region.

It will also provide a reliable drinking water supply to millions of people and support industrial and urban development. Apart from agricultural and drinking water benefits, the Godavari-Krishna-Cauvery Link is expected to create employment opportunities, promote hydropower generation, and enhance inland water transport, contributing to economic growth. Once implemented, this project will play a pivotal role in water resource management, ensuring sustainable development and resilience against climate change in southern India.

The Mahanadi-Godavari River Linking project is another crucial initiative aimed at addressing water imbalances in eastern and southern India. This ambitious project seeks to transfer 10,105 million cubic metres (MCM) of water annually from Mahanadi River through Mahanadi-Godavari link canal and then be diverted to the Krishna, Pennar, and Cauvery river basins, ensuring better water management and benefiting the drought-prone regions of Andhra Pradesh and Telangana. The project has the potential of providing irrigation to an area of 4.42 lakh hectares in Nayagarh, Khurda, Cuttack, Puri, Ganjam, and Gajapati districts of Odisha and Srikakulam, Vizianagaram and Visakhapatnam districts of Andhra Pradesh. By efficiently utilizing excess water, the project will enhance irrigation facilities, boost agricultural productivity, and provide drinking water to millions of people in water-scarce areas. It is also expected to help in groundwater recharge, reduce dependency on uneven monsoon and mitigate the impact of droughts. Additionally, the project will support hydropower generation, contribute to inland navigation, and create significant employment opportunities, strengthening the rural economy.

SPML Infra has been a key player in India's water infrastructure sector since 1981, successfully executing over 700 projects across the country. With expertise in bulk water supply, irrigation systems, wastewater treatment, urban water management, and smart water solutions, the company has played a pivotal role in enhancing water security and sustainable resource management.

The Parbati-Kalisindh-Chambal (PKC) Link Project is planned to divert surplus water from the Parbati, Newaj, and Kalisindh rivers to the Chambal River at Gandhisagar/Rana Pratap Sagar, while ensuring irrigation benefits to multiple districts in Madhya Pradesh and Rajasthan. The project aims to transfer 1,360 million cubic meters (MCM) of water, facilitating irrigation over 65,657 hectares in Madhya Pradesh, covering districts such as Rajgarh, Guna, Shajapur, Mandasaur, Morena, and Bhind, and 43,082 hectares in Rajasthan, benefiting districts like Jhalawar, Kota, and Chittorgarh.

India's River Linking initiatives have 30 river interlinking projects at various stages of planning and execution. These projects will play a crucial role in enhancing water security, improving irrigation,

mitigating droughts, and boosting agricultural productivity, ultimately contributing to economic growth across multiple states and regions.

SPML INFRA: PIONEERING BULK WATER SUPPLY AND IRRIGATION SOLUTIONS

SPML Infra Limited is a leading player in bulk water supply infrastructure, with expertise spanning dam construction, canals, lifts irrigation, micro irrigation, large diameter pipeline, and tunnelling. The company has successfully executed major projects in the water supply and irrigation sectors, including the construction of large dams, diversion tunnels, intake and de-silting systems, electro-mechanical works, and critical civil infrastructure such as pumping stations, powerhouses, tunnels, intake structures, and spillways. The company has designed and implemented canals, lift irrigation, and micro irrigation systems to facilitate bulk water transmission, ensuring drinking water supply and

With a strong commitment to innovation and sustainability, SPML Infra continues to be a trusted partner in transforming India's water infrastructure, ensuring efficient water management, conservation, and equitable distribution across diverse regions.



enhanced irrigation benefits for farmers in drought-prone regions. Currently, SPML Infra is executing one of India's largest irrigation projects under the Saurashtra-Narmada Avtaran Irrigation (SAUNI) Yojana, a visionary initiative aimed at irrigating approximately 1.8 million hectares of land across Saurashtra, Kutch, and North Gujarat. It aims to benefit farmers by diverting 1,233 million cubic meters of floodwater overflowing from the Narmada dam to the Saurashtra region.

The project will benefit millions of farmers while also supplying potable water to around 39 million people across 132 towns and 11,456 villages in Gujarat, addressing both agricultural and domestic water needs.

The ISO 9001:2015 certified SPML Infra Limited is recognized among the World's Top 50 Private Water Companies, holding a global rank of 14, according to a study by Global Water Intelligence (GWI), London. With decades of experience in executing large-scale water infrastructure projects, SPML Infra has established itself as a leader in bulk water transmission, irrigation systems, and integrated water resource management.

The company has successfully delivered complex, high-value projects, including urban and rural water supply systems, dams, canals, lift irrigation, micro irrigation, and tunnelling, demonstrating its ability to handle challenging terrains, advanced engineering, and large-scale water distribution networks. SPML Infra's expertise in design, execution, and project management makes it a natural choice for implementing river interlinking projects across different states. By leveraging its capabilities, the company is set to play a pivotal role in enhancing water security, supporting sustainable water resource management, and ensuring equitable distribution across India.

WAY FORWARD

To ensure that river interlinking is both effective and sustainable, a balanced approach is needed. Comprehensive environmental impact assessments should be conducted to minimize ecological damage. Incorporating smart water management technologies, such as real-time monitoring and automated control systems, can enhance operational efficiency. The alternative water conservation methods like rainwater harvesting, groundwater recharge, and watershed management should be promoted alongside river interlinking. Involving local communities, environmental experts, and state

governments in the planning process can help address social concerns and ensure equitable water distribution.

In conclusion, river interlinking has the potential to transform India's water management system, ensuring water security for millions. However, its success depends on careful planning, sustainable execution, and collaboration among stakeholders. A holistic water management strategy, combining river interlinking with conservation efforts and modern technology, will be crucial in addressing India's water scarcity challenges while preserving its ecological balance.



ABOUT THE AUTHOR

Mr. Subhash Sethi, Chairman of SPML Infra Limited, is a visionary leader with over five decades of experience in infrastructure development. A renowned author of the acclaimed book REBOUND, he has been instrumental in advancing India's water management sector. His contributions have earned him numerous accolades, including the prestigious Economic Times Asian Business Leadership Award, recognizing his innovation and impact in infrastructure development.

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