
RIVER LINKING PROJECT – JALGAON, MAHARASHTRA

DOCUMENTATION OF BEST PRACTICE

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Executive Summary

River connectivity is seen as a possible way to equally distribute of water across a geographical region. Conceptually, inter-linking water ways is appreciated by policy practitioners to resolve water problems but the practical ecological concerns usually delay the implementation. Along these lines, India's National River Linking Project that aims to connect the rivers in the Ganges basin to rivers in western and southern India has been an issue of debate. The displacement of people due to land acquisition is also a cause for concern. Nevertheless, the nationally acclaimed river linking project in Jalgaon has overcome these challenges by exploiting regional strengths in geography and existing infrastructure.

This best practice documentation intends to provide insights into the design and achievements of the River Linking Project that has been successful in making adequate water available for irrigation and human consumption throughout the district.

Jalgaon, due to its location, receives inadequate rainfall during monsoon season. Inefficient storage facilities also means that reservoirs, canals, and ground water supply are always below the minimum storage level. In 2005, when the district witnessed an almost drought like situation, the local administration felt the need to look for a long term solution. Given that there was already a network of canals and reservoirs to channel the water, interlinking of waterways seemed to be an appropriate solution. Planning looked to restore the capacity of the existing infrastructure and allow for excess water from nearby dams to irrigate water scarce areas.

This initiative is inspiring as it was conceptualised, planned and implemented within four months. The participatory and proactive approach taken by district administration ensured that they gained the support of the local people in fulfilling the project objectives.

BACKGROUND

Jalgaon, located in the north of Maharashtra, falls in a rain shadow area with a higher probability of drought compared to its neighbouring districts. Local topography also adds to the problem through unequal distribution of rainfall in the natural drainage area. Tapti's tributaries - Girna, Bori, Anjani, Titur and Waghur - are the important rivers, with Girna Dam being a major source of water supply at the south west corner of district. Even though there are man-made canals to network the water for local irrigation and storage purposes, the reservoir storage capacity never reaches its minimum level. As such, the recurring problem of water scarcity is usually addressed by supplying water tankers to provide temporary relief.

In 2005, when Jalgaon was experiencing drought-like conditions, the then district collector conceptualised the river linking project to resolve perennial water crises by diverting excess water from Girna dam to water-deficit regions. This idea of connecting rivers, although not new, was executed in an innovative way which helped to overcome the challenge of balancing ecological concerns, human displacement and high costs. In this case, the local administration followed a methodical approach to sustainably implement the project in a timely manner with minimal costs.

At the start, Girna Dam, located at Nashik-Jalgaon border, was identified as the key source of excess rainwater. As such, the plan became that Girna Dam, through the river, would be linked to other rivers, canals, reservoirs to make the water flow into areas that needed it. The administration conducted a study to understand the developmental strengths and weaknesses of the district. From this assessment, existing infrastructure was identified and incorporated into new linkages to reduce costs and minimise any negative environmental impact.

OBJECTIVE

The project aims to equitably distribute water and to resolve water scarcity for drinking and irrigation purposes by linking various water channels. Its specific objectives are to:

- Divert water from water surplus areas to arid and semi-arid parts of the district
- Increase the efficiency of different water storage structures
- Conserve water by channelling it through canals ducts, drains, nallahs, natural drains etc. into drought-prone areas
- Identify the inter-relationships of recharge areas with geology and geomorphology practices to examine the soils and structure of the area

- Detect land use changes over time and determine their relationship with changes in the area of connectivity
- Carry out qualitative and quantitative assessment of water resources
- Suggest suitable sites and methods for artificial recharge to augment ground water recharge in the area
- Establish and evaluate long-term research on monitoring, measuring and planning for sustainable development in the area under benefit
- Assess the socio-economic impact of the river connectivity initiative

WORKING DESIGN

The project was developed with the goal of completing the task within the limited time period of two to three months to ensure that the surplus rainwater from the 2005 monsoon was used in time. The project entails a combination of rain water conservation and utilisation of flood water run-off to replenish natural and artificial water bodies through natural drainage channels.

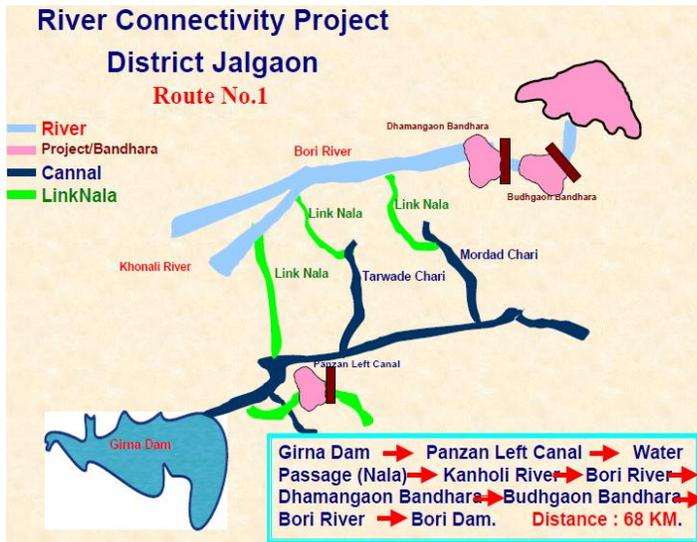
To create the linkage architecture, the administration first took the following steps to assess the on the ground scenario:

- A detailed field level survey (undertaken by the irrigation department) to investigate water scarce areas and to study the efficiency of the groundwater recharge structure
- Identification and assessment of existing infrastructure to minimise construction of new canals
- An evaluation to understand the natural contours of the region that could be exploited to divert water
- Discussion with beneficiaries to understand the needs of the local population

One of the major hindrances to undertaking a river connectivity project is the acquisition of land for digging link canals. As a consequence, the administration followed a consultative approach to include the stakeholders at the conceptualisation stage. Once identified, the district administration met with landowners affected by the project to discuss the initiative and also to inform them about the increased productivity of land resulting from improved irrigation. This encouraged the landowners to donate their land for the project as it enhanced the commercial value of the land that was otherwise considered barren. The administration was

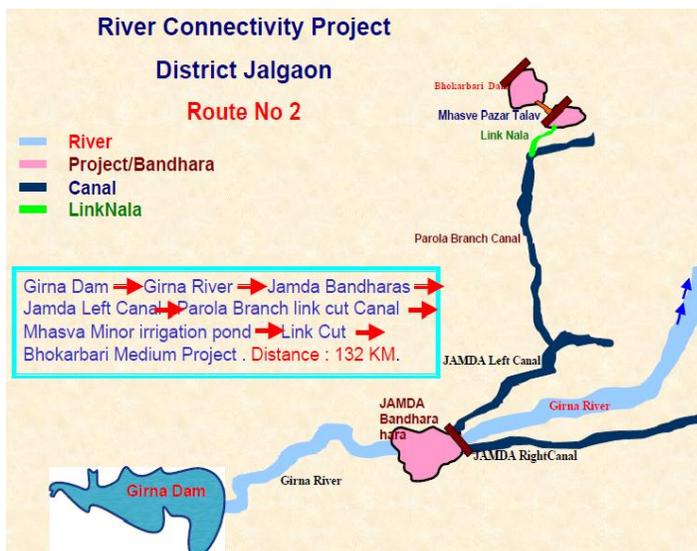
also proactive in consulting with stakeholders from various government departments and elected representatives to increase support for the project.

After initial exploration, the five tributaries - Girna, Bori, Titur, Mhasva and Anjani - were inter-linked with various canals and reservoirs to develop water resources for the area. The following are the five route maps:



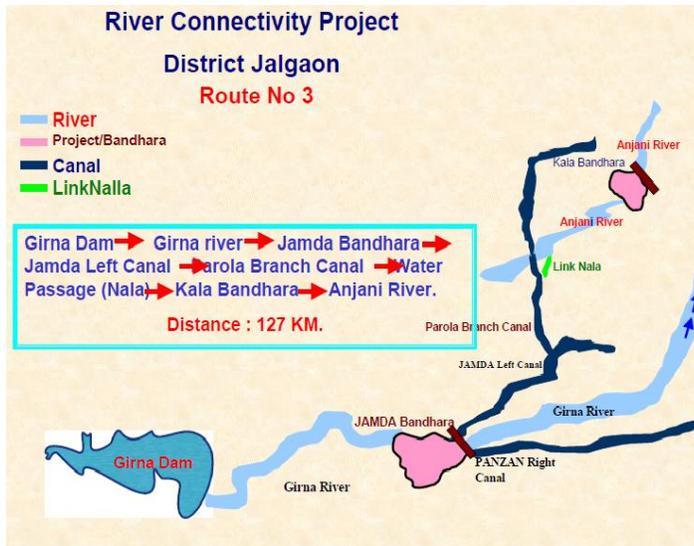
Route 1: Connecting Dam to River

Girna Dam was first linked with Bori River to increase the water supply at Bori dam as it is the main source of supply for 74 villages. Excess flood water from Girna is diverted to Panzan left bank canal and then short connections were created to divert surplus water from Panzan Canal to Bori river, which was not possible earlier.



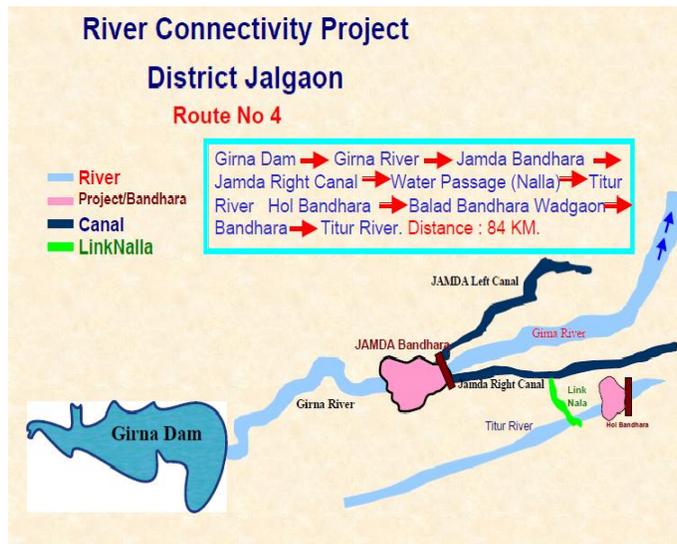
Route 2: Connecting Canal to Pond

The second step was to connect Girna to Mhasva Pond. The project was planned in such a way that overflowing water released from the Girna dam could be diverted to Parola Branch Canal and then, through a link, canal water was used to fill the pond.



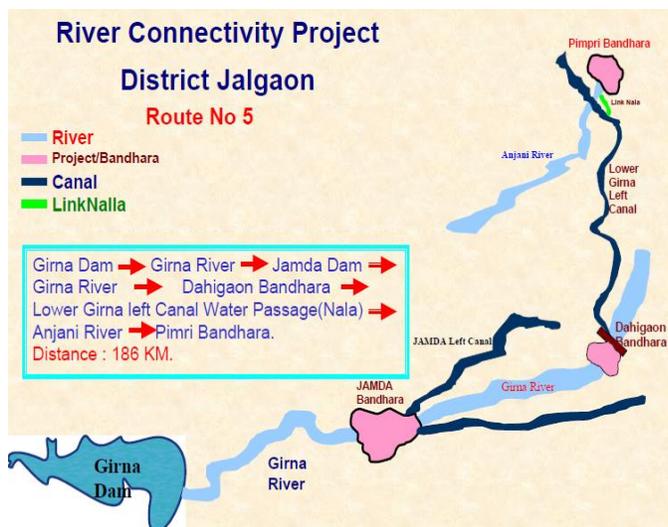
Route 3: Connecting Canal to River

A new link canal was built to make water flow from Parola Branch Canal to Anjani river and Kala bandhara.



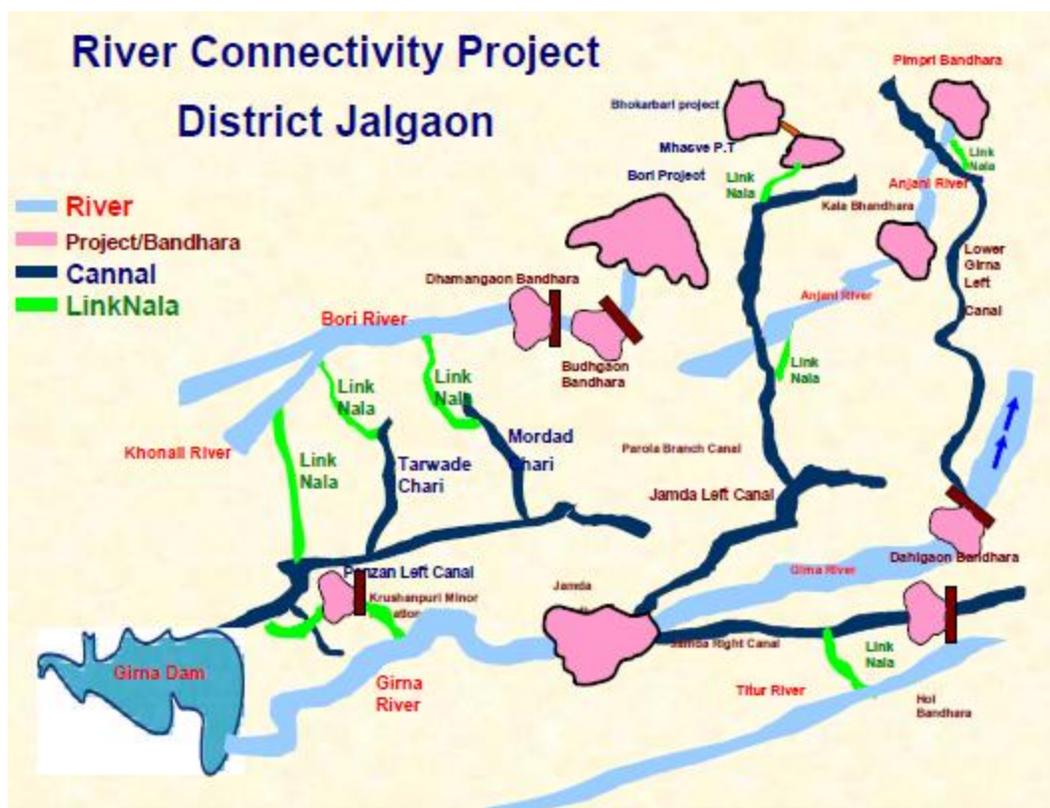
Route 4: Connecting Rivers

Girna river was connected to Titur river through existing Jamda Right canal by creating a new link canal. This was done to provide additional water to Titur river from Girna Dam



Route 5: Increasing Water Storage Capacity

The water from Girna Dam was channelled through canals and a new link nala to provide additional water for storage at Pimpri bandhara.



River Connectivity in Jalgaon

Modifications to Existing Infrastructure

Apart from building new links, the capacity of existing canals was improved by modifying the height with mud. Canals were also lined with PVC paper to avoid leakages and increase the flowing capacity, also known as the rugosity coefficient. Specifically, Jamda Left Bank Canal and Panzan Left Bank Canal were upgraded using low cost PVC papers at canal apexes and aqueduct beds as they are the main channels of diverting water from Girna Dam to other water bodies.

Storage capacity of reservoirs/bandhara was also increased to retain maximum amount of water by creating temporary fences using gunny bags. A safe level was maintained in case of flooding and so that the barriers could easily be removed in such a situation.

Financial Support

Funding for the project was provided by elected officials and the state government. The district administration presented the project development report to the local leaders, and once the elected representatives were convinced about the significance of the project for the community, grants from the Member of Parliament Local Area Development Scheme (MPLADS) were made available to partially fund the project.

A cost-benefit analysis was presented separately to the state government to request for funding. The project was proposed as a plan to overcome water scarcity issues in the area and not simply connecting rivers. It was shown that the overall cost of implementing the initiative was much lower as compared to undertaking additional measures for improving the availability of water. The Government of Maharashtra allocated Rs. 2 crores from the scarcity fund.

METHODOLOGY

For the purpose of this best practice, the OneWorld Foundation India Governance Knowledge Centre (GKC) research team conducted a telephonic interview with Mr. Vijay Singhal, the former District Collector of Jalgaon, who was instrumental in conceptualising the project. In addition, data was gathered from sources available on the public domain.

Further documents on technicalities of river connectivity in Jalgaon can be found on the District Administration's website accessible at http://jalgaon.gov.in/Html/River_Linkage.htm.

KEY STAKEHOLDERS

- Jalgaon District Collectorate: The District Collector's office played a pivotal role in conceptualising the project. The project was conceived in order to address the recurring water problem, which is the collector's responsibility.
- Irrigation Department: The irrigation department assisted with initial funding for the project and also provided the technical guidance in needs assessment.
- Elected Representatives: Financial support was offered by political leaders to implement the project.
- State Government: Funding for the project was provided by the government under Water Scarcity.
- Landowners: People donated part of their land for construction of new link canals.

LESSONS LEARNED

By distributing surplus water to deficit areas, the government has successfully made resources available to 128 villages and 5 municipal corporations. In total, 8.5 lakh people have benefitted and the total irrigated area has increased from 13,000 hectares to 30,000 hectares in 2008.

The impact of project was assessed through a socio-economic survey in 2007 by JalaSRI, a watershed surveillance and research institute in Jalgaon. The survey covered a random sample of 840 households in 42 villages, out of the total population of 300 villages. Over 84 percent of the people are in favour of river linking efforts, and nearly 54 percent of farmers have noticed increases in the level of water in their wells with 57 percent of people reporting adequate drinking water.

Successful implementation of this river linking project is encouraging at a time when the national river linking project is being questioned as an environmental disaster. The following lessons derived from Jalgaon's experience can aid in the planning process of other such initiatives.

TAKING SMALL STEPS

The national river linking project has the ambitious goal of connecting perennial Himalayan Rivers to monsoon dependent rivers in west and south India. Changing the entire course of river through creating artificial linkages could prove disastrous for the natural environment. In Jalgaon, these issues were addressed by taking small steps. Girna Dam, due to its location in Nashik district, had water available during monsoon season, but since there was no way of controlling the additional water, it would flow into the Arabian Sea. It was thus identified that extra water from Girna could be diverted in a planned way to boost the volume of available water in the existing water network. Only short linkages were created between already present water bodies to divert water to required areas.

USING STRENGTHS OF LOCAL TOPOGRAPHY

Due to a widespread power crisis, and the high cost of installing electric pumps to facilitate the flow of water, the administration opted to exploit the geographical strengths of the region towards improving the flow of water. The natural contours were identified through a baseline study and the route for link canals were decided after that. This helped in keeping the cost of the project low.

EXTENSIVE FIELD ASSESSMENT

This initiative was implemented after doing a baseline assessment to understand the local conditions and needs. Villagers and agriculturalists were approached to comprehend the

current scenario of water availability.. This helped in planning the routes in a well-organised manner and also to gain support from the villagers as they became aware of the project planning.

PARTICIPATORY APPROACH

The absence of any objection from various sections of society makes this project unique. The administration proactively included all stakeholders in the planning process to gather support and build confidence. Villagers were educated about benefits of the project and encouraged to be a part of it. As mentioned previously, land for creating new link canals were donated by the local people with no compensation from the government.

STRONG LEADERSHIP

The project was implemented success because of the strong leadership offered by the administration and namely, the District Collector. With a background in civil engineering, he was able to visualise the project for the region and could also anticipate the challenges.

Research was carried out by the OneWorld Foundation, Governance Knowledge Centre (GKC) team.

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REFERENCES

Jalgaon District Administration Website: [Jalgaon.gov.in](http://jalgaon.gov.in)

Pictures sourced from Jalgaon administration:

<http://jalgaon.gov.in/html/Pdf/river%20linking%20new%201812%20final.pdf>

APPENDIX A

1. It is impressive to know that project was planned and executed within 4 months. What steps were taken to complete the project in such a short amount of time?
2. Who are the stakeholders in this project? What are their roles and responsibilities?
 - a. How did the administration coordinate between different stakeholders to ensure on time completion?
3. River linking is a technical project that needs a good geographical understanding of the area. What kind of technical guidance was available for the project?
 - a. Was there any use of GIS mapping to plan/execute the project?
4. How were the water bodies for river connectivity identified?
5. The project seems to have utilised natural contours to make the water flow in specific direction. Was new infrastructure built to channel the water? If so, what?
6. The design of the project relies on excess water from Girna dam to provide water for rivers. Is that the only source of water? What happens when the water in reservoir is low?
 - a. Is there any monitoring mechanism to check the water level?
7. In terms of planning the project, how was the participatory approach undertaken? Was it at district level or village level? How did the use of participatory planning contribute to the success of this project?
8. Residents of Jalgaon gave their land for the project voluntarily. What motivated them? Was there any compensation given for the land?
 - a. Often there are environmental protests against river connecting projects in India. How did the Jalgaon administration tackle this issue?
9. Given that Girna dam is in Nashik district, were there any administrative issues with neighbouring districts?
10. Considering that Jalgaon is a drought prone area, were there any projects in the pipeline to resolve water scarcity issue prior to the river linking project? What about today?
11. How is the water situation in Jalgaon today? Has it experienced drought after 2005?