

# **Jalgaon River Linking Project**

**Demand-based Project Through Citizen's Participation**



# 1 Jalgaon River Linking Project – A Demand-based Project through Citizen Participation

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## Background

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The July 2005 torrential rains in Maharashtra bring back memories of losses of hundreds of lives, destruction to property and inconveniences caused to many in the state. Images of people in distress in Mumbai on 26<sup>th</sup> July 2005, publicized by the media, both print and television, are still fresh in everybody's minds. The media blitzkrieg on tales of helplessness against the fury of the monsoon that followed, ignored stories of how citizens used this crisis to effect important remedial changes. One such case that missed the media glare is the Jalgaon River Linking Project.

## About Jalgaon

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Jalgaon District is located in the north-west region of the state of Maharashtra. It is bounded by Satpuda mountain ranges in the north, Ajanta mountain ranges in the south. Jalgaon is rich in volcanic soil which is well suited for cotton production. It is a major business centre for gold, pulses, cotton and bananas. Languages spoken are Marathi, Ahirani, Hindi, and English. Jalgaon District receives an average rainfall of about 690 mm and the temperature varies from 10-48 degree Celsius.

The principal natural feature is the Tapti River. Unlike the rest of the Deccan, whose rivers rise in the Western Ghats and flow eastward to the Bay of Bengal, the Tapti flows westward from headwaters in eastern Maharashtra to empty into the Arabian Sea. The Tapti receives thirteen principal tributaries in its course through Khandesh region. None of the rivers is navigable, and the Tapti flows in a deep bed which historically made it difficult to use for irrigation.

The district hosts a population of about 4 million in an area of about 11,700 sq km. It is abounded by many religious places and cultural establishments. The World famous Heritage site Ajanta Caves is near to Jalgaon (50 km) making it as one of major International Tourist hub.

## Jalgaon River Linking Project

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The Jalgaon district was unfortunate to receive scanty rains while most of Maharashtra was experiencing flood-like situations. The Jalgaon district had received less than average rainfall, i.e., only 15% by mid-July and 73% by end-October 2005, and that too in unequal measures. Seven tehsils of Jalgaon district were in particular largely affected. There was no run-off water in the rivers and nalas; consequently, all water reservoirs were empty and ground water level was

depleting while in the neighboring Nashik district, the Girna dam was overflowing. So this excess water from the Girna dam, which was otherwise going waste, had the potential of being diverted to the water-scarce regions of Jalgaon.

The diversion of the surplus water from one region to the needy areas will avert the perennial danger of floods and thus effectively harness the natural resources available. The concept of transferring water from one basin to another is not new, but minor solutions closer to the users would yield quick results without many hurdles and would constitute the first step in taking up major river-linking initiatives. There are a number of schemes for water conservation -- DPAP, IWDP, NREGS, SGRY, etc., but such water conservation - “khet ka paani khet mein aur gaon ka paani gaon mein” - is possible only in places which receive substantial rainfall. Today rains are very erratic, some places receiving extremely heavy and other places receiving no rainfall. For rain-deprived areas, the only feasible option is to divert water to them from areas of excess rains by way of the river-linking technique. In fact, the work of water conservation and river connectivity should proceed simultaneously through watershed development.

### **Project Objective**

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*Providing water for drinking as well as irrigation purposes in the drought-hit areas of Jalgaon district by using diverted excess overflowing water, by adopting the “River Linking Technique”*

The less than adequate rainfall in the seven tehsils was likely to create drought-like conditions. To overcome this problem and provide water for drinking purposes, usually in times of scarcity, new borewells are dug, temporary water supply schemes (TPWS) or existing water supply schemes are used or as a last measure, tankers deployed. But such an approach involves expenditure of crores of rupees every year. Moreover, this expenditure does not create any permanent asset. The option of providing water tankers to tackle scarcity is also not sustainable. Often planning is **supply-driven rather than demand-based; this drawback was attempted to be addressed through the Jalgaon River Linking Project.**

## **River Linking Technique**

This river linking project in Maharashtra, India, is based on innovative methods of linking of natural and artificial water drainage for inter-basin and intra-basin water transfer. This is a unique technique of rain water conservation; utilization of flood water run-off and replenishing natural and artificial water bodies through natural and artificial water drainage channels. The excess water in a river is utilized to recharge the ground water bodies and dry wells in its command areas. The project is designed for the optimum utilization of rainfall-runoff for inter-basin and intra-basin water transfer through innovative technologies of both surface water transfer and ground water recharge. The principle of watershed management within the command area is used not only for agriculture purposes, but also for drinking water and industrial purposes.

*The basic objectives of the river connectivity initiative are to:*

1. Divert the water in arid and semi-arid parts of the district from water surplus areas
2. Increase the efficiency of different water storage structures
3. Conserve the water by taking it through canals ducts, drains, nallahs, natural drains etc. in the drought-prone areas
4. Identify the inter-relationships of recharge areas with geology, geomorphology, soils and the structure of the area
5. Detect land use changes and correlate them with changes in the area of connectivity over the years
6. Carry out qualitative and quantitative assessment of water resource
7. Suggest suitable sites and methods for artificial recharge to augment ground water recharge in the area.
8. Establish and evaluate long-term research on monitoring, measuring and planning for sustainable development in the area under benefit
9. Assess and model the socio-economic impact of the river connectivity initiative

## **Project Duration**

This project was conceptualised, planned and executed over a period of three-four months in 2005.

## Strategies Adopted

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The problem of drinking water became very grave and acute in 2005. There were possibilities of loss of Kharif crops too. It was decided that the excess water in the Girna dam would be diverted to the water-scarce regions in the Jalgaon district by interlinking various rivers.

### **Participatory Approach in Planning**

The citizens were involved in the planning. Taking suggestions from local villagers and assessing their technical feasibility was an integral component of the project. The local villagers willingly parted with parts of their land to enable the inter-linking of rivers. The fact that not a single voice was raised in opposition to the project is a testimony to the success of the participatory approach in planning.

### **Interlinking to be developed using existing natural drainage systems and canals**

It was strategised that existing canals were to be used to the maximum extent possible. These canals were repaired and their capacities enhanced by desilting and raising embankment heights. The existing natural big drains, riverbeds and channels were also used to a large extent and also additional canals and channels were dug wherever required.

### **Use of gravity rather than pumping for diversion of water**

The project was planned in such a manner that the natural contours and gravity would be fully utilized in the diversion of water. This was critical not only to keep costs and maintenance low and but also to impart sustainability to the project.

## Highlights of the Initiative

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### **Solved the drinking water problem for a population of about 8.5 lakhs**

The project provided tangible and immediate benefit to the local people: It solved drinking water problems of one municipal corporation, five municipal councils and 123 villages. The population that benefited from this project numbered about 8.5 lakhs.

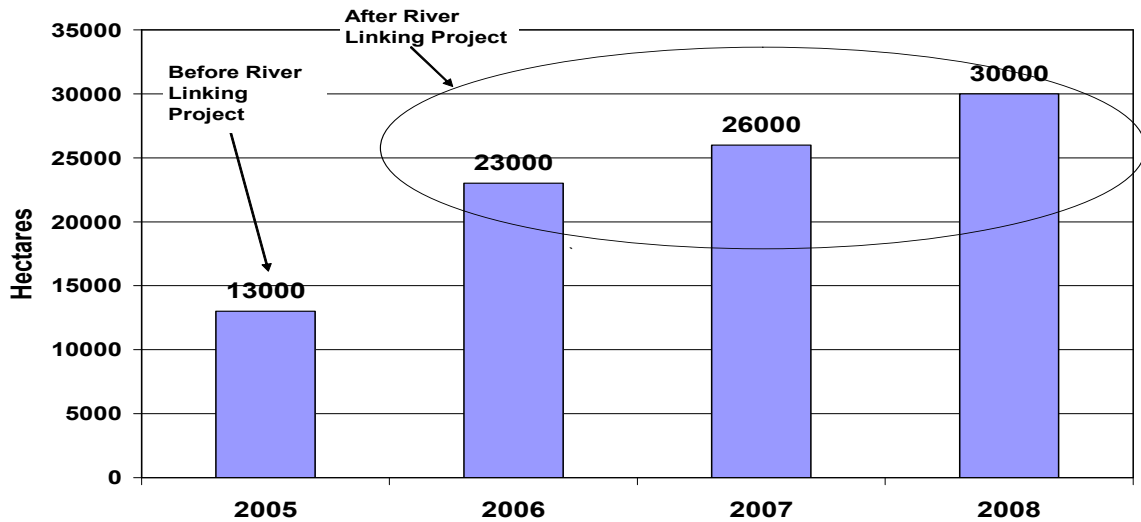
### **Resulted in additional storage capacity of 4,886 Mcft of water valued at Rs.11 crores**

This river linking project resulted in additional storage of about 4,486 mcft (million cubic feet) water in the district. The value of this additional water made available is about Rs.11 crores. In total, around 700 medium, small dams, K.T. weir, village tanks and percolation tanks were filled and more than 16,000 water wells were recharged because of this river connectivity project.

Irrigated area increased from 13,000 hectares in 2005 to 30,000 hectares in 2008

The river-linking project helped increase the area under irrigation from 13,000 hectares (Ha) in 2005 to 30,000 Ha in 2008. Total estimated benefits received by agriculturists ranged between Rs.25-30 crores annually.

**Figure 1-1 Area under Irrigation before and after River Linking Project**



Did away with the need for water supply by tankers in areas hit by water scarcity

The increased water availability for drinking purposes has done away with the need for tanker water supply, implying a savings of about Rs.9 crores per annum.

**Figure 1-2 River Linking Project Impact**



**Bori Medium Project**

← **Before**



**After** →



## Reduced dependence on rainfall

This has also resulted in an increase in the water table in some tehsils inspite of receiving 35%-45% less than average rainfall. **This has been endorsed by GSDA (Ground Water Survey Development Agency), an agency of the Government of Maharashtra in its report.**

### **Findings of a Socio-Economic Survey conducted by JalaSRI in 2007**

The benefits and after-effects of the Jalgaon River Linking Project have been validated through an independent socio-economic survey by a third party agency. This survey has been conducted in 2007 – two years after the project’s implementation. The findings prove that the project is not only successful, but also sustainable; its benefits are still being enjoyed by the people of Jalgaon. The project has been positively received by all sections of society. This survey was conducted by the renowned organisation – JalaSRI, a Watershed Surveillance and Research Institute at Jalgaon (Maharashtra, India) funded by National Science Foundation (NSF) Program on Digital Government Research and Development of USA.

The survey was scientifically conducted, based on random sampling. JalaSRI conducted a socio-economic survey of 840 households belonging to 42 villages. These households were randomly selected out of 300 villages in the region and spread over eight tehsils out of the fifteen tehsils of the Jalgaon District in September 2007.

- Eighty-one percent of the households surveyed are engaged in farming and 5% are agricultural workers. 52.8% households have incomes ranging between Rs. 10,000 to Rs.25,000 per month. 25.59 % of the houses are made up of mud and 23.80% have been constructed using cement.
- 84.52 % are in favour of the river linking efforts.
- 53.92% farmers have noticed considerable rise in water levels of their wells.
- 64.64% people have positive approach towards the Government agency.
- 26.15% households reported their active participation in the execution of the links contributing to 2142 non-working days.
- 42.2% people reported increase in their employment opportunities.
- 57% people reported receipt of adequate drinking water.
- 50% of the people are well aware of the river linking project and have positive opinion about the river linking project.

## Resource Convergence – technical and financial

There are various channels through which the Government can spend money for the welfare of its citizens. Often the money spent does not attempt to bring in synergies by aligning complementary spending. For instance, in the case of Jalgaon, the following sources of funding can be tapped.

Department	Source / Purpose of expenditure
Jalgaon Collectorate	Funds allotted to tackle problems in times of water scarcity
Irrigation Department	Building of dams – minor and major and survey, repair & maintenance of dams and canals
Municipal Corporation / Councils	Internal resources for augmenting water availability for drinking
MP / MLA Local Area Development Scheme	For various developmental works within their respective jurisdiction.

Each of the stakeholders identified above could jointly address the issue of water and river-linking in Jalgaon. The Irrigation Department agreed to fund the initial project survey cost and provided technical assistance in making the project a reality.

1. The Government of Maharashtra's high-powered committee was convinced to allocate Rs. 2 crores from the scarcity fund for a novel river-linking project.
2. Funding was also made available from the MPLADS and MLALADS schemes and support from various Municipal Councils was also available.

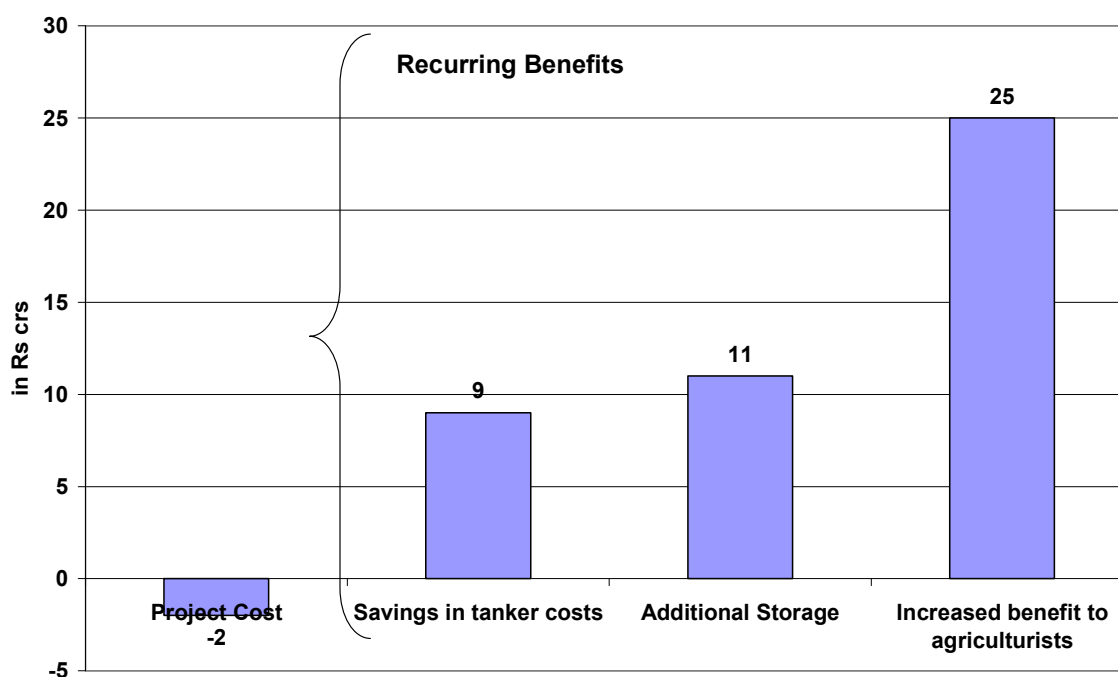
The involvement of these stakeholders meant that a strong platform was created for support to be generated from a wider audience. This project is a fine example of several different departments working together and pooling their respective strengths to achieve a common objective -- tackling water scarcity and providing water for irrigation and other various purposes. This had improved the living conditions and socio-economic status of the people of Jalgaon.

This integrated approach to project planning and execution would not have been possible without the vision and perseverance of Shri. Vijay Singhal, the then Collector & DM of Jalgaon.

## Zero Land Acquisition Cost

The involvement of the citizens in the planning process allowed the potential benefits of the project to be disseminated among the people at large. The citizens were willing partners in the project. They readily parted with parts of their land to make the project possible. In the process, they enhanced the commercial value of their land which earlier was considered barren. The availability of water for irrigation on account of diversion of water resulted in the land becoming productive. Further, the local people also participated in the project by being physically involved in the river-linking works. The monetary value of the local people's contribution – parting with their land and providing labour -- would have far exceeded the government contribution of Rs.2 crores.

Figure 1-3 Recurring Benefit in excess of Rs. 45 crores annually



The project has not only addressed the area's water requirements but also the employment issue as it helped in providing employment in the district and thus improved its economic profile.

## Replicability

Adequate drinking water and water for irrigation are major issues in many parts of the state. Though the initiative undertaken by the Jalgaon collectorate is specific to the prevalent watershed area and topography of the district, this technical experience could be used as a model for replication in other parts of the state and the country. The Maharashtra State Government has recognized the immense potential of projects and accordingly issued a Govt.

resolution to implement projects in every district along the lines of the Jalgaon River Linking Project. The success of this initiative has encouraged Government/districts to make allocations for such projects every year in the budget as parts of a regular planned scheme.

The Government of India has also taken the decision to implement river linking but it has not yet implemented this decision fully because of various reasons. No of problems are also to be encountered while implementing this i.e., land acquisition, environmental, social and legal issues etc. If these kind of small projects are implemented considering one, two or few districts as a unit depending upon various technical factors i.e. alignment, topography, natural drainage networks etc, much better results can be achieved as the project will then be both cost-effective and citizen-friendly. The experience of Jalgaon shows that land acquisition will not be a great problem and also we can use local technical know-how and their expertise.

## **Role of Collector**

### *Thinking Out of the Box*

The situation of uneven rainfall and water scarcity in Jalgaon district was not a novel one. The usual response to such situations would have been to resort to tanker supply to the affected villages in the region and the acceleration of water supply schemes under implementation in the district. Such remedial measures may solve the problem of water scarcity but would not provide a sustainable solution. It is to the credit of the nominee for an 'out-of-the-box' solution to the water problem in Jalgaon. The river-linking project was not only completed in record time but also has solved the water problem in the district in times of water scarcity. The nominee has not only displayed the vision but also led a multi-agency team in getting the project implemented.

### *Converging diverse interests of different agencies towards the welfare of people of Jalgaon*

The nominee has not only achieved inter-linking of rivers but also linked the diverse interests of all stakeholders. He has been instrumental in marshalling the resources from the Irrigation Department, State Government and MP/MLA LADS. The transparency in the planning process and stakeholder consultations allowed the project to gain wider acceptance. The people willingly gave part of their land wherever required and with the anticipation the river linking project will enhance the value of their un-parted land.

### *Diligence in planning and focusing on sustainability allowed the project to avoid the ecological disaster that river-linking projects are associated with*

The nominee used his technical qualification in conceptualizing the project. His emphasis on using the natural drainage channels, expanding the carrying capacity of the existing canals and with minimum digging of new canals has allowed the project to accrue benefits to the people in the region even after three years of project execution. This project has thus destroyed the myth that river-linking projects are ecological disasters. The success of such projects can potentially reopen the chapter on the national river-linking project. This project has highlighted the emphasis on bottom-up planning and building on successes of minor projects such as this which will eventually emerge as links to a larger project.

## Project Recognition

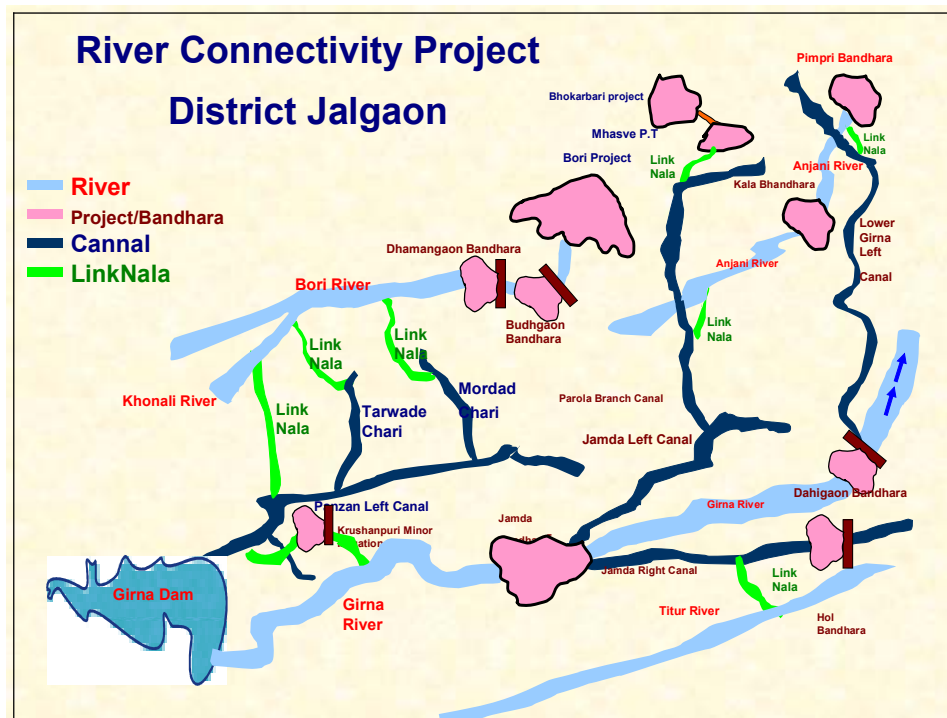
- The Department of Administrative Reforms, Government of India has evaluated the project and identified it as MODEL PROJECT and one of the success stories of Indian public administration. The project details and achievements have been found worthy for dissemination to a wider audience. As per DARPG's directive, the Jalgaon River Linking project details are being documented and copies of this report (350 in all) are being sent to all Chief Secretaries and concerned departments of all States and Union Territories, Parliament House Libraries and 28 Administrative Training Institutes in the country.
- The project outcomes have been appreciated by H.E. Smt Pratibhatai Patil, President of India and Hon. Minister for Agriculture, Shri. Sharad Pawar and other dignitaries .
- The then Chief Minister of Maharashtra Shri. Vilasrao Deshmukh impressed by this novel project and such projects need to be implemented in every district in the state and accordingly issued a Govt. resolution to implement projects in every district along the lines of the Jalgaon River Linking Project. Maharashtra Government also sanctioned a river linking project as regular scheme in District Planning Committee (DPC) to meet out the financial expenditure for all the districts.
- Shri Vijay Singhal also had been called by the then Chief Minister of Rajasthan, Smt. Vasundhara Raje Scindhia to share his experience in implementing the project and what learning it can have for the state of Rajasthan. She also visited Jalgaon to see River Linking Project.
- Shri. Vijay Singhal was also invited by Australian government to present the Jalgaon River Linking Project at the 9th International River Symposium 2006 held at Brisbane, Australia. The symposium allowed the project details and experience to be shared with about 550 delegates over 50 countries. Shri. Singhal also presented the river linking project details at an International Conference in China in 2007 also.
- Shri Vijay Singhal also participated in the meetings and discussions on digital governance and hotspot geoinformatics and presented Jalgaon River Linking Project at State University of New York, Albany, USA in October, 2009.
- This Project Received Dr. Babasaheb Ambedkar National Fellowship Award given by National Bhartiya Sahitya Academy of India.
- I have received **“Prime Minister Award for Excellence in Administration”** for River Linking Project.

## Appendix: Inter-linking of Rivers

### I. Linking of Bori and Girna River

The Girna Major project is located on the border of the Nashik and Jalgaon districts. In 2005, Nashik district received heavy rains and the Girna dam was full around mid-July 2005. During that period, in the interest of flood management, 64,000 cusecs water was released in the Girna river from the Tapi river, and finally into the Arabian sea.

For regular irrigation purposes, the Girna project has Panzan left bank canal which flows towards Jalgaon district. The excess flood waters in the Panzan left bank canal were diverted and then the canal was breached at 31<sup>st</sup> km and water was diverted into a local nala, which flows and joins the Bori river by traveling a distance of 6 km by gravity. The Bori river flows 35 km towards the eastern side and reaches the Bori dam situated in the Jalgaon district. This way, water traveled 68 km. The capacity of the Bori dam is 1,400 mcft. After continuous efforts, some additional works on the canal and constant watch, 1100 mcft water was collected in the Bori dam. Water supply of the Parola town of the Jalgaon district and 73 villages was dependent on the water of the Bori dam. The water problems of Parola town and these villages were completely solved; so also the problems of 15 villages on the side of the Bori river were minimized.



## **II. Inter-linking of Girna and Anjani rivers**

The overflowing water was released from the Girna dam into the Girna river and then into Jamada Weir, Jamada Left Canal and from here to Parola branch canal and then water was released in Anjani river and Kala bandhara. This way, water traveled 127 km. The problems of drinking water of Erandol town and other villages were solved.

## **III. Inter-linking of Girna and Titur rivers**

The overflowing water was released from the Girna dam into the Girna river and then through the Jamada bandhara, diverted into the Jamda right canal. From this canal, the water passed into a brook and then successively into the Titur river, Hol Bandhara, Balad Bandhara, Wadgaon Bandhara and back again into the Titur river. This way, water traveled 84 km. Because of this skillful strategy, the problem of not only drinking water, but also irrigation water, was solved to a great extent.

## **IV. Filling of Bhokarbari and Mhaswa Project**

The overflowing water was released from the Girna dam into the Girna river and then through the Jamada bandhara, water was diverted to the Jamada left canal which connected to the Parola branch canal; then the water reached the Mhaswa dam. From here, water was channelised to the Bhokarbari dam. This long journey of the water of 132 km has enriched the Bhokarbari and Mhaswa projects. Because of this skillful strategy, the problem of not only drinking water, but also irrigation water was solved to a great extent. The mechanism of the inter-linking is shown in a map.

## **V. Filling of Pimpri bandhara**

Water was released from the Girna dam into the Girna river and then into the Jamada bandhara, the Girna river and Dahigaon bandhara successively. From there, the water passed into the Lower Girna Canal and then through the brook, this water was channelised and released into the Anjani river and then stored in the Pimpri bandhara. In this last stage, the water traveled 186 km. Because of this skillful strategy, the problem of not only drinking water but also irrigation water was solved to a great extent.