Towards Water Security

Government takes initiatives to address scarcity issues

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Gujarat is among the fastest growing states in India. Its gross state domestic product increased from $158.19 billion in 2015-16 to about $200 billion in 2016-17. This growth is mainly attributable to the state's large industrial base as well as its substantial contribution to India's exports.

Further, over the past few years there has been a significant increase in the number of industrial clusters, petrochemical complexes, airports and ports in the state. It has also emerged as a hub for automobile manufacturing, pharmaceuticals, electronics, gems and jewellery, textiles, and engineering.

According to a study by the Reserve Bank of India, Gujarat accounted for the highest share in the country's total investment for financial year 2016-17. Of the total investment flown into the country, Gujarat accounted for 22.7 per cent of the aggregate investment. In addition, foreign direct investment (FDI) in the state surged four times since 2013-14 ($860 million) with funds worth $3.36 billion invested during 2016-17.

Despite the increasing trend of FDI and growing industrial base, the state still needs to focus on adequate civic infrastructure such as irrigation, drinking water and power. This is mainly due to the rapidly growing urban population. The share of urban population stands at about 43 per cent. This is expected to increase to around 55 per cent by 2020, thereby increasing the demand-supply gap. Since Gujarat has access to only about 2 per cent of the country's water resources, it becomes difficult to cater to 5 per cent of India's population residing in the state. Clean water availability is an issue for almost two-thirds of the state's population.

Current scenario

The total water availability in the state is 50 billion cubic metres (bcm). Of this, 38 bcm is surface water and the remaining 12 bcm is groundwater. More than 80 per cent of the surface water is being used for irrigation leaving little for drinking and industrial purposes. Therefore, water supply is largely dependent on groundwater. Further, as compared to the national average of 1,545 cubic metres per person, the per capita fresh water availability in Gujarat stands at 945 cubic metres. Moreover, recurrent droughts, and low rainfall with skewed distribution pattern, make the scenario more severe. Water pollution, in general, and degradation of groundwater quality, in particular, add to the water scarcity issue.

Water scarcity solutions

In order to provide long-term solutions to the state's water woes, the Gujarat government is investing towards the development of water supply infrastructure. Three agencies, the Gujarat Water Supply and Sewerage Board (GWSSB), Gujarat Water Infrastructure Limited and the Water and Sanitation Management Organisation are at the forefront to implement various water supply schemes in the state.

The following are some of the key water supply schemes initiated by the government:

- Saurashtra Narmada Avtaran Irrigation Yojana (SAUNI Yojana): The Rs 108 billion scheme is currently under implementation. It aims to benefit farmers by diverting 1 million

acre feet of floodwater overflowing from the Narmada dam to the Saurashtra region. The diverted water will be distributed to 115 reservoirs through 1,115 km of pipelines. This water will be used to irrigate 1.8 million hectares of land, mainly in Saurashtra, Kutch and northern Gujarat. The project will eliminate water scarcity in 132 towns and 11,456 villages in Saurashtra, Kutch, northern Gujarat, Panchmahal and Ahmedabad. Currently, around 1,650 million litres per day (mld) of water is supplied to 39 million people across these regions.

- Swarnim Gujarat Bulk Water Supply Project: The Rs 25 billion project was completed in over two years' time and supplies drinking water to 17.5 million people in and around 4,700 villages and 100 towns of Saurashtra, and 880 villages and 14 towns of the Kutch region. Under the project, three bulk pipelines (2,400 mm wide each) carrying 1,650 mld of water from the Narmada to Hadala near Rajkot, Khirai near Maliya-Miyana in Morbi district and Navda in Botad district have been laid. The pipelines help in minimising seepage, and controlling illegal tapping and evaporation of open canals.
- Rural water supply schemes: The state government has also initiated a number of rural water supply schemes to provide adequate water for drinking and other household purposes. These initiatives essentially involve providing hand pumps, individual water supply schemes, regional/group water supply schemes, mini programmes based on electric or solar energy, internal distribution water supply schemes, recharging of underground sources, and rooftop rainwater tanks. These schemes have been designed considering the 100 litre per capita per day of water demand (including water demand of cattle).
- Urban water supply schemes: GWSSB has been entrusted with the task of setting up urban water supply projects in 23 cities under the Gujarat Urban Development Mission. Of these, 20 projects have been completed and the remaining are under execution. These projects have helped address the water crisis substantially and provided potable water supply to the citizens. Meanwhile, the state government is also executing several water supply projects in Morbi, Rajkot district, under the Atal Mission for Rejuvenation and Urban Transformation.

These initiatives taken by the state government have started showing results. The groundwater level is already up by 67 per cent in some parts of the state. SPML Infra has also contributed significantly to some of these schemes. The company has executed Phase I of the SAUNI Yojana on an engineering, procurement and construction (EPC) basis. Given the complexity of laying large-diameter pipelines in different terrains and volatile weather conditions, the project posed many challenges for the company.

Key issues and challenges

One of the biggest challenges was that Indian manufacturers lacked the capacity to manufacture and supply 3,000 mm three-layer polyethylene-coated pipes. The facilities had to be upgraded to get the pipelines with the required specifications. The transportation of heavy pipes (each 12 metre pipe weighed 15.6 metric tonnes) was another challenge. SPML Infra had to develop the complete logistics using specially made 18-wheel low bed trailers to ensure safe transportation to different locations. Besides, the laying of huge pipes, jointing, welding and coating have to be carried out with precision. Further, work has to be completed within a stipulated timeline without compromising the safety of the teams. To this end, SPML Infra trained the workers and provided them with safety equipment and other facilities. With proper planning and management control at the site, transportation and placement of heavy pumping machineries was completed. Moreover, to ensure quality and longevity, rotators for all the pumps were imported from Germany.

The successful completion of Phase I helped SPML Infra receive the contract for the execution of Phase II of the project. The work under Phase II involves the laying of 36.6 km of mild steel pipelines with 3,000 mm diameter and 17.5 mm thickness along with pumping station and allied works.

Another water supply project executed by SPML Infra is the Swarnim Gujarat Saurashtra – Kutch Water Grid Project. The scope of work involved the laying of 75.9 km of a bulk water transmission line in Dhanki, Navada and Dudhrej, and construction of two large pumping stations with 560 mld and 545 mld capacity on an EPC basis. Post commissioning of the project, SPML Infra is carrying out the operations and maintenance activities for a period of five years.

Other EPC projects being developed by SPML Infra include the 50 mld water treatment plant (WTP) in Dholera, Gujarat, and the lift irrigation pipeline project for the transmission of 50 cusecs of water in Bhasariya, Gujarat, to augment various reservoirs of the region. The WTP with a clear water reservoir and water transmission system will provide potable water to industrial, residential, commercial and other users in the Dholera special investment region.

Lessons learnt

For SPML Infra, each project is unique and comes with distinctive challenges. According to the company, teamwork and consistent performance measured approach is required for timely execution of the project. To provide an impetus to work, SPML Infra believes in employee empowerment at all levels. Additionally, from its past experience the company has learnt to anticipate bottlenecks which are faced during project execution and preemptive measures are taken at every step to eliminate the delays.

Conclusion

Despite the efforts made to augment the water supply in Gujarat, there are significant demand-supply gaps. These gaps are with regard to the regulation of water sourcing and distribution, water quality, improvement in quantum of water available in rural areas and community participation in water management. With rapid economic growth and urbanisation, the water sector needs much more attention in terms of tariff rationalisation, reduction in water distribution losses, sector reforms as well as private sector participation.