

The logo for SMART Water & Waste World. The word "SMART" is in large, teal, sans-serif capital letters. Below it, "WATER & WASTE" is in large, blue, sans-serif capital letters, with the ampersand in grey. To the right of "WATER & WASTE", the word "WORLD" is written vertically in grey, sans-serif capital letters.

SMART
WATER & WASTE **WORLD**

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MUNICIPAL CASE STUDIES

**SPECIAL
EDITION**

RURAL WATER SUPPLY SYSTEM - WATER TO MASSES

SPML Infra has completed a regional water supply scheme for 72 villages and 24 NRV and their dhanies in Nawa tehsil, Nagaur district, Rajasthan under Bisalpur-Dudu Water Supply Project on a single responsibility turnkey basis.

By Subhash Sethi

Countries across the globe are facing the challenges of rapidly growing water demand, driven by increasing population and economic growth with emerging trends of urbanization and industrialization. The trend is the same in India as well and the water scarcity problem is not only a result of quantitative or qualitative scarcity but also a consequence of inefficient use and ineffective water management. According to the 2030 Water Resources Group, demand for water in India is set to outstrip supply by 50% by 2030. A significant challenge faced by India is therefore to increase conservation of water across operations and geographies.

At present, almost 75% of Indian households do not have proper access to clean drinking water and close to 90% of rural households have no access to the piped water supply. The water demand has been increasing faster than ever in the past few years compared to earlier trends. It has been estimated that the per capita water use in India will increase from the current level of 99 liters per day to 167 liters per day in 2050, so the gap is widening day by day, by increasing population, urbanization and industrialization combined with the need for raising agricultural produce. The supply of water is inadequate compared to its growing demand in the country.

Sustainable development and efficient management of water resources are becoming increasingly important and complex due to challenges being faced by India. It is estimated that more than 2.2 million people die each year from diseases related to contaminated drinking water and poor sanitation. 90% of these are children under the age of 5, mostly in developing countries including India. Safe drinking water and hygienic sanitation facilities are a requirement to fight against poverty and hunger in the world where over a billion people have no access to any source of drinking water.

INDIAN WATER SCENARIO
Precipitation in the form of

rain and snowfall provide over 4,000 trillion liters of freshwater to India. Most of this freshwater returns to the seas and ocean via many large rivers flowing across the subcontinent. A portion of this water is absorbed by the soil and is stored in underground aquifers. A much smaller percentage is stored in inland water bodies both natural (lakes and ponds) and man-made (tanks and reservoirs). Of the 1,869 trillion liters of water reserves, only an estimated 1,122 trillion liters can be exploited due to topographic constraints and distribution effects. India's land area in terms of water can be divided into 19 major river basins. The water availability of these basins varies from a low of 240 m3



160 MLD WATER TREATMENT PLANT, DHANNASER, RAJASTHAN



BISALPUR-JAIPUR WATER SUPPLY PIPELINE

in the Sabarmati basin to a high of 17,000 m3 in the Brahmaputra basin, while water withdrawals vary from 243 m3 in the Meghna basin to 1,670 m3 in the Indus basin. Agriculture is by far the largest user of water in India.

The total 140 million hectares of net sown area, only 48.8 percent is under irrigation and rest is dependent upon rain. Out of the net irrigated area of 68.38 million hectares, about 60% is irrigated through groundwater. Indian Council for Agriculture Research (ICAR) is working on a mechanism to suggest crop planning for India under which farmers would be recommended which crop is to be grown in how much area to reduce water consumption in agriculture.

By 2050, the impact of climate change is expected to result in less water flow in most of the river basins putting the already strained water resources of the country under severe stress. This apart, the Indian water sector has been facing the issue of quality, sustainability, and transparency. As a consequence, there are critical factors putting an enormous burden on it. Some of these factors include:

- Regulatory challenges
- Aging infrastructure
- Emerging contaminants
- Retiring workforce
- Water loss and revenue loss
- Sustainability (both the quantity of water and operational efficiency)
- Consumer transparency, etc

water. Therefore, with a growing demand for water and depletion of the available water, an assured supply of good quality water is becoming a growing concern.

A report prepared by the 2030 Water Resources Group (WRG) predicted that by 2030, the gap between demand and availability

Management Index, 21 major cities are racing to reach zero groundwater levels by 2020, and nearly 600 million people in India is likely to face extreme water stress. Big cities like Chennai, Mumbai, Delhi faces regular water crisis, especially during summers. The situation can be better

Year	Population (Million)	Per Capita Water Availability (m ³ /year)	% Change from Previous Year
1951	361	5177	
1955	395	4732	-8.59
1991	846	2209	-53.31
2001	1027	1816	-17.92
2011	1210	1545	-14.92
2025 (est)	1394	1341	-26.37
2050 (est)	1640	1140	-14.98

Table 1

WATER DEMAND IN INDIA

India with its population, size and agriculture practices use more water than many other countries. Indians are also the largest freshwater users in the world. Around 65% of India’s total water demand is for groundwater, which plays an important role in shaping the nation’s economic and social development. Agriculture, domestic and industrial use, respectively, comprises India’s largest uses for

of water in India will be 50% with the demand touching about 1500 Billion Cubic Meter (BCM) and availability approximately 750 BCM. This growing demand-supply imbalance will have significant implications on accessibility of water across the industrial, domestic, and agriculture sectors.

The stress on scarce water supplies is widening and according to the NitiAayog report on Composite Water

understood with the per capita water availability in India (Table 1).

TECHNOLOGICAL INTERVENTION IN WATER

In the last few decades, information technology and digital innovation has been happening in different segments and water sector has also got its share of digitization. Internet, software code and cloud-based business applications that

have matured over the last two decades are enabling water companies and utilities across the globe with robust analytics, real-time dashboard, and cellular sensor technologies that allow data to feed into any modern application for timely decision making.

As more modern, integrated technologies are adopted in the water industry, the sustainability of infrastructure (more visibility and predictive abilities of infrastructure needs across the system), of operations (efficiency and lowering the cost of execution), and of people (applying modern digital applications to manage the execution of work) becoming easier. The technological intervention helping to mitigate risk because operations can better manage measure and track all that needs to be captured to ensure compliance and efficiency, shifting the operation mode from reactive to proactive.

RURAL WATER SUPPLY SCHEME - NAWA, RAJASTHAN

Rural Water Supply Schemes initiated by the State Government of Rajasthan to provide regular safe and adequate water for drinking and other household purposes to every resident of planned villages and other habitats. The need to provide full water supply coverage to rural areas, despite local water scarcity and increasingly contaminated sources, despite being complex and expensive, have helped millions of people getting clean drinking water facilities.

SPML Infra has completed a regional water supply scheme for 72 villages and 24 NRV and their dhanies in Tehsil Nawa, in Nagaur district of Rajasthan under Bisalpur-Dudu Water Supply Project on single responsibility turnkey basis.

PROJECT BACKGROUND

Out of the total 1522 villages proposed to be covered under the Bisalpur-Dudu Water Supply Project, 718 villages were to be covered under phase-I Part-I of the project and 804 villages are to be covered under phase-I Part-II. Out of the 804 villages, 72

villages shall be fed from transmission main system-1 in Part-II of the project. The work of transmission main system has been executed and completed under a separate contract. On this transmission main-1, three headworks, namely, Malpura, Dudu and Sambhar have been constructed. The 72 villages and 24 NRVs and their dhanies of Nawa tehsil is being covered from the Sambhar headworks under part-II of the scheme.

SCOPE OF WORK

The objective of the works executed under this project is to deliver the designated demand for water at each village in a safe, effective and reliable manner. For design purposes, maximum pumping hours has been taken as 16 hours and the minimum terminal pressure is a minimum 7 meters at the highest point of village or dhani.

The scope of work under this single responsibility project included the construction of all works for the regional water supply schemes for 72 villages and 24 NRVs and their dhanies of Nawa tehsil. The drinking water supplies of 72 villages, 24 NRVs, and their dhanies are being done from three water pumping stations situated at Govindi, Simbhupura and Nawa.

While the clear water reservoir at Sambhar main point has already been commissioned under a separate contract, 3 clear water reservoirs of capacities ranging from 3500 kiloliters to 8000 kiloliters and ancillary works has been constructed at Sambhar, Govindi, Simbhupura and Nawa head works.

Under this project, apart from the above works, SPML Infra has also completed the laying, jointing, testing, and commissioning of 823 kilometers of HDPE, DI and uPVC Pipeline of 75 mm to 300 mm diameters of gravity/pumping mains/internal village and dhanies pipelines along with the EPDM rubber ring as per the pipe network. It has

PROJECT FILE

CUSTOMER: PUBLIC HEALTH ENGINEERING DEPT., JAIPUR, GOVERNMENT OF RAJASTHAN

LOCATION: NAWA TEHSIL, NAGOUR, RAJASTHAN, INDIA

SERVICE PROVIDER: SPML INFRA LTD.

PRODUCTS/TECHNOLOGY INVOLVED: WATER PUMPING STATIONS, HDPE, DI AND UPVC PIPELINE

also constructed 4 pump houses of various capacities having a total of 10 pumping machineries along with the construction of 15 numbers of overhead water reservoirs of capacities ranging from 200 kiloliters to 850 kiloliters. The project has been completed and it is under the operations and maintenance with SPML Infra for 10 years.

LAST WORD

The number of critical factors Indian water sector is struggling with is unparalleled compared to other industries. The solution lies in solving some of these critical issues facing the sector; it will take financial resources, people resources, technological resources and smart partnerships with innovations to truly shift the paradigm from reactive to proactive mode.

ABOUT THE AUTHOR

Armed with business education and firm belief in his potential to inspire change, **Subhash Sethi** has transformed the nation's approach of water infrastructure solutions for the public good.

Under his leadership, SPML Infra Limited has established itself as the leader in water domain and developed sustainable infrastructure helping water utilities to deliver safe and clean drinking water to millions of Indian citizens.

SPML Infra Limited, the leading water management company has contributed immensely towards providing clean drinking water to more than 50 million urban and rural populations in India. In a legacy of over four decades, the company has executed more than 600 projects thus creating value assets for drinking water facilities, wastewater treatment, integrated sewerage networks, better municipal waste management, power transmission & distribution and rural electrification. SPML Infra is first Indian company featured among the World's Top 50 Private Water Companies as per the research conducted by Global Water Intelligence, London. SPML Infra also features among India's Top 500 Largest Corporations as per the Fortune India research report.

