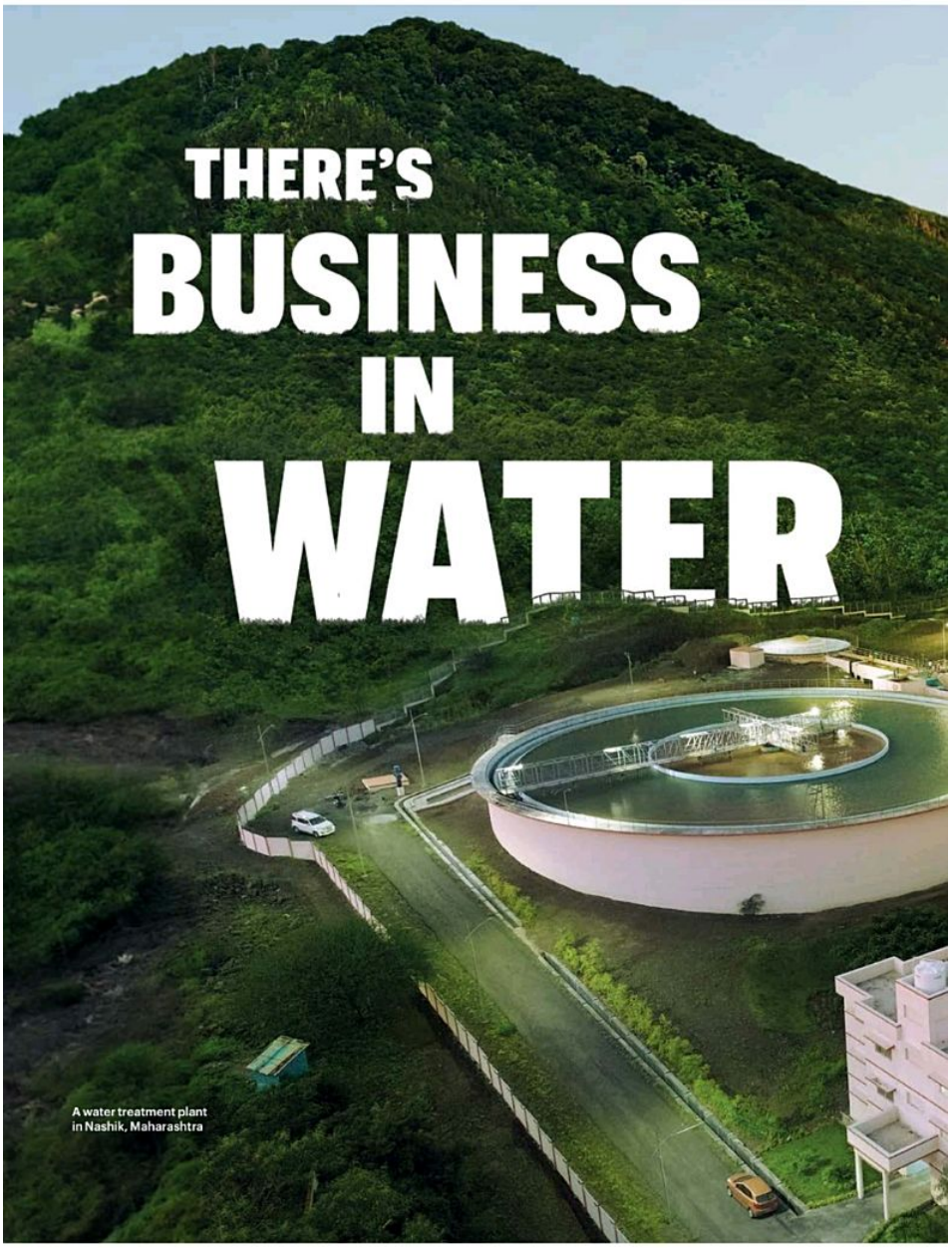
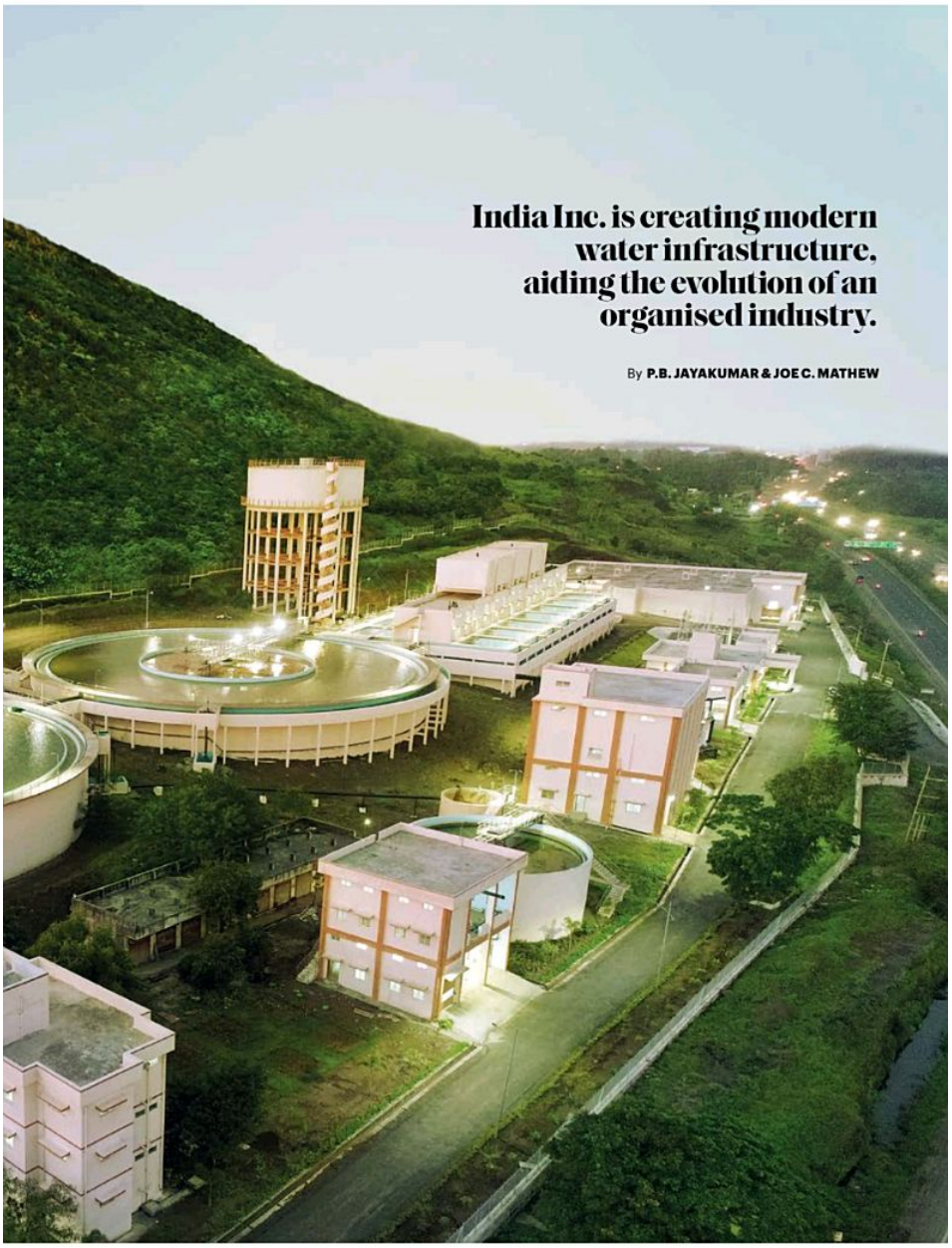


A water treatment plant in Nashik, Maharashtra



India Inc. is creating modern water infrastructure, aiding the evolution of an organised industry.

By **P.B. JAYAKUMAR & JOE C. MATHEW**

₹1,06,727 CRORE
Centre's outlay for water schemes in FY24

THROUGH THE glass-panelled windows on the 16th floor of Maker Chambers 6 in Mumbai's Nariman Point, all that Arun Lakhani, chairman and MD of Nagpur-based Vishvaraj Environment, sees is just water. The Arabian Sea is on one side and fishing boats floating in the tiny waves of Back Bay on the other. Lakhani is among the pioneers of public-private partnership (PPP) in water and sewage treatment projects in India.

Nowadays, his focus is on the Ganga and Yamuna rivers. Vishvaraj is constructing a chain of sewage treatment plants (STPs) along the Ganga (Kolkata) and Yamuna (Agra). Around ₹1,000 crore is required to set up this infrastructure. While Central and state governments will provide ₹600 crore on annuity, Vishvaraj has to invest the rest for constructing plants within two years. "Financial closure is done with two Austrian banks for funding our investment part," says Lakhani.

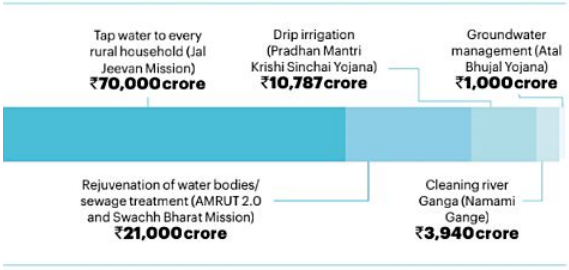
In the south of the country, in Chennai, veteran water technocrat Rajiv Mittal, chairman and MD of VA Tech Wabag, is fine-tuning a detailed blueprint. Rated as India's biggest and the world's third-largest water infratech company, Wabag is all set to implement South-east Asia's largest sea water desalination project in Chennai. "The ₹4,400 crore project will resolve Chennai's water woes to a great extent," says Mittal. The firm is also implementing a number of projects under the Centre's Namami Gange Mission.

Just a few kilometres away from Mittal's office at infra major Larsen & Toubro's Chennai office, Asok Kumar, executive vice president and head, water & effluent treatment, is busy talking to his teams — those constructing water and wastewater treatment facilities for the industrial corridor at Tumkur (Karnataka); lift irrigation projects in Orissa; teams irrigating 500 villages of Dewas & Dhar (Madhya Pradesh), and those providing drinking water facilities in Fazilka and Ferozpur districts of Punjab. "We are executing drinking water projects for over 2 crore people covering hundreds of kilometres under the Jal Jeevan Mission," S.N. Subrahmanyan, MD and CEO, L&T tells *Fortune India*.

India's water and wastewater management practices are changing. From small firms running municipal water supply, irrigation, wastewater and sewage management, the who's who of India Inc. such as L&T, VA Tech, Vishvaraj Environment and Thermax have jumped on the bandwagon.

The business opportunity is huge. Budget FY24 earmarked ₹1.07 lakh crore towards water and related infrastructure under six different schemes, an increase from ₹83,525 crore in FY23 and ₹91,567 crore in FY22. "Till mid-May this year, we have been adding one new household water connection every second, every day," Vini Mahajan, secretary, Department of Drinking Water and Sanitation, Ministry of Jal Shakti, tells *Fortune India* in an exclusive interview. Namami Gange Mission sanctioned 441 projects worth ₹37,300 crore, of which 251 have been completed. The rest are at various stages of execution, says Asok Kumar, director-general, Namami Gange.

Apart from riding on money from government schemes, rising demand for industrial water has made water and wastewater management a serious business opportunity. From a fragmented industry with 100-odd players with maximum 2-3% market share, it is on its way to migrating to new technologies and professional operations.



What Numbers Say

The stats are definitely in favour. According to a World Bank report, India with 18% of the world's population has only 4% of water resources. Per capita water availability is around 1,100 cubic metres (m3), against globally recognised threshold water stress of 1,700 m3 per person. India is also the largest net exporter of virtual water (needed to produce products that are exported).

Niti Aayog estimates "utilisable water resources" in India at 1,123 billion cubic metres (BCM), which includes groundwater (433 BCM) and surface water (690 BCM). India uses more than 80% of surface water for agriculture. Nearly 85% of drinking water supplies are dependent on aquifers, many of which are contaminated. Niti Aayog predicts 21 cities will face groundwater shortage by 2030, affecting 100 million people. Depleting groundwater level is another problem. Groundwater level in 30% of wells have depleted by 0-2 metres, according to the Central Ground Water Board.

To add to the concern, industrial water demand has been rising as well. End-user industries, including agriculture processing, mines and coal processing, municipal, food and beverage, pulp and paper as well as emerging ones such as solar farms and semiconductor manufacturing all require huge amounts of water.

Changing Momentum

Historically, drinking water distribution, municipal water and sewage management have been chaotic in India. According to the Central Pollution Control Board, while urban sewage generation is estimated at 72,368 million litres per day (MLD), installed sewage treatment capacity is only 31,841 MLD. As of December 12, 2022, operational capacity was 26,869 MLD. "Rough estimates say 1,000 STPs are run by municipal corporations and most lack quality standards, proper operation and maintenance," says Ashish Bhandari, MD and CEO, Thermax. Around 70% of wastewater generated goes directly into rivers and lakes, he adds.

Water, wastewater and sewage treatment are state subjects, and have been managed by civil contractors and local administrations. Once STPs are constructed, most administrations run them on their own rather than

PHOTOGRAPH BY **FORTUNE INDIA**

Desalination, water reuse, and sewage treatment will be business lines with potential."

ASOK KUMAR
Executive vice president and head, water & effluent treatment, L&T

LARSEN & TOUBRO

Water business is part of L&T's infrastructrure business, and constitutes 71% of its ₹4 lakh crore orderbook.

Specilist in EPC and related businesses such as wastewater, irrigation, and industrial & infrastructure.

Commissioned 100 million litres per day (MLD) desalination plant at Dahej, lift irrigation and micro-irrigation projects in MP, Karnataka, Tamil Nadu, and sewarage project in Bihar.

> **India hasn't taken up desalination projects to resolve water crisis."**
>
> **RAJIV MITTAL**
> CMD, VA Tech Wabag

VA TECH WABAG

Order book at ₹1,885 crore in 9MFY23; total orderbook value at ₹10,037 crore as on December 22, 2023.

To implement South-east Asia's largest-ever sea water desalination project in Chennai for ₹4,400 crore.

Has executed more than 1,450 plants, including 450-plus sewage treatment plants and 320-plus water treatment plants.

bringing in professional companies. And since getting funds and bills sanctioned on time are nagging issues, most corporations choose to stay away.

But all that's changing. Thanks to global agencies, including World Bank, JICA and ADB getting involved in funding water infrastructure and emergence of a new PPP model. Currently, in many projects under the Hybrid Annuity Model (HAM), construction is scheduled for two years followed by a 15-20 year operation & maintenance (O&M) contract. "HAM and long-term O&M contracts reduce risks and funding uncertainty of developers since liquidity is ensured like in EMI payments," says Mittal of Wabag.

Drinking Water Solutions

The government has already spent over ₹1.7 lakh crore out of the ₹3.6 lakh crore earmarked under the Jal Jeevan Mission to provide tap connections to the last mile, says Mahajan.

L&T, which bagged water infrastructure projects to irrigate 500 villages of Dewas and Dhar districts in Madhya Pradesh, underground drainage in Coimbatore, pipeline works from Tappar dam to Nirona dam in Gujarat, lift irrigation projects in Orissa and Rajasthan industrial corridor, has a "substantial" water vertical orderbook, says Kumar. Tata Projects, too, has a water vertical, and projects include Hanota and Banda Dam, water supply projects at Bhind, Sagar, Bhopal, and the Dravyavati river rejuvenation project. Adani Group is also testing waters with a few projects.

> **Food and beverage processing units want technologies that can reuse up to 95% water."**
>
> **ASHISH BHANDARI**
> MD and CEO, Thermax

THERMAX	Orderbook at ₹10,505 crore (as of June 30, 2023).	Air pollution and water and wastewater solutions are among six major businesses.	Has commissioned sewage treatment plants of 275 kilo litres per day (KLD) and 325 KLD.

Even foreign players are eyeing a bigger chunk of the pie. French water giants — Veolia and Suez — have been in India for years. Though these firms have merged globally, the Indian businesses continue to operate separately. Veolia, which has been in the country for over 20 years, operates in parts of New Delhi, Maharashtra, Karnataka and Greater Mohali, providing water to 5 million people. It also treats 1,000 MLD of water and industrial wastewater. The company acquired Vishvaraj's stake in joint venture Orange City Water two years ago. The JV was supplying water to Nagpur.

"Professional firms with technology and expertise are required to maximise available water resources," says Guillaume Dourdin, CEO, India, Veolia.

Suez has been operating in Mumbai for over 35 years with two water treatment facilities at Bhandup and Panjrapur. The company claims to supply 70% of water to the city. It also supplies water to 3.5 million people in New Delhi and has built three drink-

PHOTOGRAPH BY **NRENDERA BISHT** (RAJIV MITTAL), **ABHIJIT BHATLEKAR** (ASHISH BHANDARI)

India has set up an installed capacity of just over 31,000 MLD of STPs, in a country that generates 71,000 MLD of sewage."

ARUN LAKHANI
CMD, Vishvaraj Environment

VISHVARAJ ENVIRONMENT

Orderbook of ₹2,200 crore and another ₹2,500 crore in the bidding pipeline.

30 plants of 2,138 MLD of water treatment plants serving 42 million people.

ing water production units in Bengaluru. PR Jindal group company JWIL Infra, which diversified into water infrastructure recently, saw its orderbook increase to ₹3,140 crore in September 2022, from ₹300 crore in FY18.

According to a World Bank report, projects with $1.2 billion financing have provided 20 million people access to water in rural areas. The Bank is funding water supply in Uttarakhand, Jalanidhi in Kerala, Karnataka, Punjab and Chennai. The ADB's South Asia Urban Development and Water Division's pipeline projects for India in 2020-2022 include 16 projects with an overall loan amount of $3.4 billion and grants worth $4.5 million. "Last-mile connectivity was an issue in public-funded schemes. Now professional planning, technology and O&M are solving the problem," says Anil Jain, vice chairman & MD, Jain Irrigation.

Large-scale corporate CSR is also helping in the transition. "We are committed to providing safe water access to over 100 million people worldwide by 2030," says Garima Singh, chief government affairs and communications officer, PepsiCo India. Coca-Cola India, through its Coca-Cola India Foundation, Anandana, has 500-plus water-harvesting projects benefiting 1 million people, says Coca-Cola India.

Experts say India's current water treatment capacity is only 27.3% and sewage treatment is 18.6%. As per industry estimates, 15 water treatment plant projects — Chembarambakkam (Chennai), Ujjain, Sehore, Ratlam, Khandwa, Dhar, Chandigarh, Kamrej, Prayagraj, Vadodara, Shimla, Balliya, Baran and Chittorgarh — are in the bidding stage. Setting up 1 MLD of water unit costs around ₹50 lakh.

Irrigation projects such as the Pradhan Mantri Krishi Sinchayee Yojana, with an outlay of ₹93,069 crore are gaining business as well. The government also plans to interlink rivers. The Ken-Betwa Link Project, the country's first river interlinking programme, which involves construction of a dam and a 230-km canal to irrigate drought-prone Bundelkhand in U.P. and Madhya Pradesh, is in the works.

Water Treatment

Capital expenditure on India's water and wastewater is estimated at $2.3 billion between 2023 and 2027. Of this, $1.5 billion will be from utility/

VEOLIA

World's largest water tech firm, which supplies to Nagpur, parts of New Delhi, Maharashtra, Karnataka and Greater Mohali; has supplied to over 5 million people till date.

Treats 1,000 MLD of water, 1,000 MLD of industrial wastewater and 90 MLD of sewage every day; disposes 36,000 MT of waste.

Currently executing five-six industrial water and wastewater management projects.

SUEZ

Has set up 250-plus water and wastewater treatment infrastructure for cities and industries in the country

Produces 7.5 billion litres of drinking water every day.

Treats 1 billion litres of wastewater from over 20 cities.

To construct €700 million (500 MLD capacity) wastewater treatment facility in Mumbai.

WELSPUN ENTERPRISES

Orderbook of ₹9,600 crore in FY23.

₹2,900 crore worth of order under execution in EPC water segment.

Supplies water to 2,544 villages in Uttar Pradesh.

Has set up ₹4,636 crore wastewater treatment plant at Dharavi, Mumbai.

JAIN IRRIGATION SYSTEMS

Largest manufacturer of plastic pipes and fittings in India.

Business of plastic division grew 35.9% in FY23, thanks to supply under Jal Jeevan Mission.

₹757 crore order for plastic division and consolidated orderbook of ₹2,354 crore in FY23.

PHOTOGRAPH BY **NISHIKANT GAMRE**

MAJOR GOVERNMENT SCHEMES

TAP WATER TO EVERY RURAL HOUSEHOLD
(JAL JEEVAN MISSION OR JJM/NATIONAL RURAL DRINKING WATER MISSION)

Launched: Aug 15, 2019

AIM
- Provide tap water connection for 19 crore-plus rural families by 2024.
- No. of rural household with access to piped water:
  Aug 15, 2019: 3.23 crore
  March 31, 2023: 12 crore

DRIP IRRIGATION INFRASTRUCTURE FOR FARMS
(PRADHAN MANTRI KRISHI SINCHAI YOJANA OR PMKSY)

Launched: July 1, 2015 (scheme extended till FY26)

AIM
- Improve water-use efficiency in irrigation; raise cultivable area.
- Creation of 13.88 lakh hectare irrigation potential and 30.23 lakh cultivable command area coverage by FY26.

REJUVENATION OF WATER BODIES/REUSE OF TREATED SEWAGE
(ATAL MISSION FOR REJUVENATION AND URBAN TRANSFORMATION OR AMRUT 2.0)

Launched: June 2015 (scheme extended as AMRUT 2.0 since Oct 1, 2021)

AIM
- Focus on better sanitation and water-use efficiency via water management.
- Till March 2023, 137 lakh tap connections and 105 lakh sewer connections have been provided.
- Total sewage treatment capacity of 6,347 million litres per day being developed.
- 2,322 park projects executed, adding 4,512 acres of green spaces; 908 acres being created additionally.

other segments and $717 million from the industrial sector. A 2022 Frost & Sullivan report estimates India's water and wastewater treatment market at $2.1 billion in 2025, compared with $1.3 billion in 2020, a compounded annual growth rate (CAGR) of 9.7%. According to Niti Aayog, the market for wastewater treatment plants, worth $2.4 billion in 2019, is anticipated to reach $4.3 billion by 2025.

And that's where global leaders such as Veolia and Suez and locals players, including Vishvaraj or Ramky, are going to gain business. Vishvaraj's revenues rose 70% year-on-year to ₹650 crore in FY23. "Having an orderbook worth ₹2,200 crore plus ₹2,500 crore in bidding opportunities... we expect to close FY24 with over ₹1,100 crore in revenues and maintain a CAGR of 40% in the next three-four years," says Lakhani. Hyderabad-based Ramky Infrastructure, which is sitting on an orderbook of ₹5,600 crore, saw its revenues grow 78% in FY23 to ₹3,161 crore, from ₹1,780 crore in FY22.

In September 2022, the Municipal Corporation of Greater Mumbai awarded Suez a €700 million contract to design, build and operate a 500 MLD wastewater treatment facility at Worli. MCGM, also known as the Brihanmumbai Municipal Corporation, plans to construct and upgrade seven STPs at Worli, Bandra, Dharavi, Versova, Malad, Ghatkopar and Bhandup to treat 2,464 million litres of sewage daily under the Mumbai Sewage Disposal Project-II at a cost of over ₹26,000 crore. The plan also involves resusing 67% of the recycled water.

According to a written reply by Bishweswar Tudu, minister of state for Jal Shakti in Rajya Sabha on December 12, the proposed sewage generation and treatment capacity of urban centres is around 4,827 MLD. At least 10 more STPs are being planned at Pinjore and Hansi (Haryana), Loniapurva in Lucknow, Hathras (UP), Narela in Delhi, Kosi Kalan near Mathura, Indore, Keorapukar in Kolkata, Raiya in Rajkot and Kota in Rajasthan.

The 564-MLD STP coming up at Okhla, Delhi, is said to be the largest in Asia. At an estimated ₹1.5 crore per MLD for STPs, the orderbook opportunity for India Inc. is ₹15,000 crore.

The World Bank is also funding $1 billion to clean the Ganga. "About 193 projects worth ₹30,797 crore have been sanctioned for sewerage infrastructure, cumulative treatment capacity of 6,039 MLD and laying of 5,251 km sewer network," says Kumar. In addition, sewerage infrastructure projects such as the Atal Mission for Rejuvenation and Urban Transformation, and Smart Cities Mission are in the works.

Reusing water is also gaining momentum. Nagpur reuses 190 MLD of wastewater. Vishvaraj Environment has constructed a treatment facility and a 20-km pipeline to help Maha-

PHOTOGRAPH BY **NARENDRA BISHT**

REJUVENATION OF WATER BODIES
(SWACHH BHARAT MISSION OR SBM 2.0)

Launched:
Oct 1, 2021

AIM
- Create adequate toilets and capacity expansion in wastewater treatment; scheme includes Swachh Bharat Mission-Grameen (SBM-G) and Swachh Bharat Mission-Urban (SBM-U).
- Construction of individual household latrines, community sanitary complexes, and assets for waste management.

SUSTAINABLE GROUNDWATER MANAGEMENT
(ATAL BHUJAL YOJANA OR ATAL JAL)

Launched: Apr 2020

AIM
- Sustainable management of ground water resources with community participation.
- Bring about behavioural changes, from consumption to conservation.
- To look at projects in 8,220 water-stressed gram panchayats of 229 administrative blocks or *talukas*, in 80 districts of Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh.

WATER CONSERVATION
(Jal Shakti Abhiyan or JSA)

Launched: 2019 (in 1,592 blocks in 256 water-stressed districts)

AIM
- Water conservation and rainwater harvesting; renovation of water bodies; reuse of water and recharging of structures; watershed development; intensive afforestation.
- Focuses on 'Catch the Rains' campaign for rainwater harvesting and setting up Jal Shakti Kendras.

CLEANING GANGA
(National Mission for Clean Ganga or Namami Gange)

Launched: June 2014 (extended till March 31, 2026)
• Projects under hybrid annuity model (public-private partnership and one-city-one-operator model)

AIM
- Rejuvenate Ganga and its tributaries.
- 441 projects worth ₹37,300 crore sanctioned till date.
- 193 projects worth ₹30,797 crore sanctioned to create a cumulative treatment capacity of 6,039 MLD and laying of 5,251 km sewer network.

rashtra State Power Generation Company cool thermal power plants in the city. "It is India's largest reuse project on BOOT (Built-Operate-Own-Transfer) model and is financially self-sustainable," says Lakhani. The company is constructing another 50 MLD reuse plant at Chandrapur in Uttar Pradesh for the same power generator.

Eye on Desalination

Of the various businesses associated with water, sea water desalination is one area that is yet to be tapped in India. Wabag is looking to fill the gap. Mittal says the recent order for 400 MLD sea water reverse osmosis desalination project for Chennai involves a 42-month construction period followed by 20 years of O&M. It will help Chennai produce 750 MLD of desalinated water along the coast. Wabag will be responsible for 70% of water production via desalination in Chennai since it already runs a plant there.

Mittal says India, with a long coastline, has not taken up desalination projects to resolve water crisis. "Tankers supply water drawn from unknown ground sources at ₹15-20 per litre in Chennai, quality desalinated water can be given at ₹7-8 per litre," he adds.

Sea water is used for cooling Tata Power and Adani Power's ultra-mega thermal power plants at Mundra. Israeli desalination expert IDE Technologies provides boiler feed water and potable water to RIL's refinery at Jamnagar. IDE has also set up two desalination plants for Nayara Energy at Vadinar in Gujarat.

Industrial Opportunities

The momentum in water management is providing opportunities for specialists in drinking water solutions, treatment plants, desalination, industrial

PHOTOGRAPH BY **GETTY IMAGES**

One new household water connection is added every second, every day"

VINI MAHAJAN, secretary, Department of Drinking Water and Sanitation, Ministry of Jal Shakti

Are we on track to meet the 2024 deadline (drinking water through individual household tap connections by 2024 to all households in rural India)?
The process of awarding tenders is almost complete. Works are under implementation across the country and moving at a fast pace. It is showing up in the outcomes. For instance, starting from January 1 this year, till mid-May, we have seen one new household water connection added every second, every day. The other happy part of the story is that we started with 16.7% coverage. Now there is no state in the country which has less than 33%.

What about availability of water?
The minimum under Jal Jeevan Mission is 55 litres per capita, daily. Some states are doing more where they are confident of more water.

The theme for this year's Jal Shakti Abhiyan is sustainability of drinking water sources. We are asking states and UTs to make sure that more than 2/3rd of households are covered by ground water-based schemes. However, surface water schemes cover a large number of households. So, about 2/3rd of the houses are covered by ground water schemes and the remaining are spring sources and surface water.

The Central government has talked about a ₹5.5 lakh crore spending plan in the water sector. Will most of it go into this scheme?
Should be. The 15th Finance Commission has tied 30% of the grants that it gives to rural local bodies to water. Of the total amount of ₹1.4 lakh crore, ₹70,000 crore is for water and ₹70,000 crore for sanitation.

solutions such as zero liquid discharge facilities and civil construction.

"Desalination, water management, farm water management, water reuse, zero liquid discharge and sewage treatment will be business lines with growth potential," says L&T's Kumar. "My water vertical will be among the fastest-growing businesses for us in the coming decade," adds Subrahmanyan.

While Wabag is sitting on a water orderbook of ₹10,000 crore, Thermax has a consolidated orderbook of ₹10,500 crore. Another specialist water solutions provider Ion Exchange had an orderbook of ₹2,923 crore as of March 31. "We have a bid pipeline of ₹8,400 crore," says Vasant Naik, group CFO.

Supply Chain

Another area that will reap growth in water businesses is the supply chain for industries such as pipes, pumps and other irrigation solutions.

Jain Irrigation, a specialist in pipes, had a consolidated orderbook of ₹2,354 crore in FY23. "JMM helped us boost domestic business and we have started supplies in Maharashtra," says Anil Jain, vice chairman and MD. Prince Pipes and Fittings, which earns 30% of its revenues from agriculture solutions and borewells and 2-3% from industry infrastructure solutions, grew its business to ₹2,657 crore in FY22 from ₹2,072 crore in FY21. "India's 35 lakh tonnes (by volume) pipe market is worth ₹35,000 crore and is growing at 7-8% per annum," says Jayant S. Chheda, chairman and MD.

Similarly, Triveni Engineering clocked a business of ₹352 crore from water in FY23, with an orderbook of ₹1,393 crore. "We provide turnkey execution and operation of water and wastewater treatment plants for municipal and industrial sectors," says chairman and MD Dhruv M. Sawhney.

All these companies are likely to grow 40-50% in the coming years, which will also help India's water management industry meet global standards — an improvement from the quality of life in the country portrayed in *Slumdog Millionaire*.

PHOTOGRAPH BY **NARENDRA BISHT**

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