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PRIVATE SECTOR ENGAGEMENT IN WATER SUPPLY

A LANDSCAPE STUDY 2021



SEWAH Sustainable Enterprises for Water And Health
An Alliance between USAID and Safe Water Network India

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ABOUT SAFE WATER NETWORK

Safe Water Network has worked alongside communities in Ghana and India since 2009 to establish decentralized and locally-owned community water purification systems that provide affordable, reliable and safe off-grid drinking water. Over the past ten years, it has facilitated over 350 Safe Water Stations, or safe water enterprises (SWEs) called 'Water ATMs' in Maharashtra, Telangana, Uttar Pradesh in India. These SWEs provide affordable, safe water access to over 1.2 million people, facing water quality challenges. Besides, the demonstration of work in the field at a credible scale, we share field learnings for policy coherence and advisory through research-based evidence. We are the 'Key Resource Centre' of Department of Drinking Water and Sanitation, Ministry of Jal Shakti and are 'Advisory Support Unit' to the Ministry of Housing and Urban Affairs. Some of our flagship policy initiatives are 'Har Ghar Jal 2030: Current Status and Next Steps', operationalized as Jal Jeevan Mission Rural and Inclusion of Water ATMs in the AMRUT City program. We share best practices in the sector through our field insights, case studies, and spotlights and lessons derived are disseminated nationally through our 'Beyond the Pipe' forum and internationally at Stockholm World Water Week and The Water and Health Conference at UNC.

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EXECUTIVE SUMMARY

A Water-Revolution is underway.

Through its Jal Jeevan Mission, announced from the Red Fort's ramparts on the 15th of August 2019, India's Government is working relentlessly to provide Functional Household Tap Connection (FHTC) to every rural household by 2024. With a budget of INR 3,60,000 crores or \$50 Billion, India's investment in water and sanitation as a proportion of GDP is among the highest compared to several countries in South Asia and countries like Vietnam that have recorded significant progress.¹ While the budget allocation in India for the water program during the preceding five-year period was 1.1%, the budget allocation has more than doubled with a 2.22% allocation during the 2021 Budget.

In the 2021 Budget, INR 50,000 crores is earmarked for the Jal Jeevan Mission-Urban, aiming at a universal water supply in all 4,378 Urban Local Bodies with 2.86 crores households tap connections, as well as liquid waste management in 500 AMRUT cities. The Jal Jeevan Mission – Urban has an outlay of INR 2,88,000 crores over five years. The 2021 Budget allocation for the Drinking Water and Sanitation Department was INR 60,030 crores and INR 9,023 crores for the Department of Water Resources under the Ministry of Jal Shakti.² With a combined allocation of nearly INR 650,000 or \$ 90 Billion, the Jal Jeevan Mission is the world's largest and most ambitious water infrastructure creation ever tried.

“ Hon'ble PM Narendra Modi

The government has no business to be in business and going ahead the mantra would be Monetise and Modernise and the private sector brings in investment, global best practices, top-quality managers, changes in management and modernisation

”

In the 2011 Census, the urban population was 377 million, with a domestic water demand of 50,895 MLD.³ The projected urban population will be 39% of total projected population, equaling 583 million by 2030, almost doubling urban India's water demand.⁴ Ensuring access to adequate quantity and good quality of water to this growing population is a time-critical mission. It is vital to leverage the private sector's knowledge, power, and funding to achieve scale and make this mission a reality, efficiently and sustainably. Laying piping infrastructure alone is not a solution. There is a need for freshwater round the year to fill those pipes by creating enough reservoirs, driving use efficiency, reducing non-revenue water, recycling, and re-use while creating new sources. The private sector can influence capacity building, implement new technologies, adopt circular economy principles, implement source sustainability measures, and manage the demand side while supporting supply-side augmentation. However, the private sector interest and funding depends upon timely payments, fair returns on their human & capital investments, outcomes and performance.

India's urban water supply services have tried Public-Private Partnerships (PPPs) since the 1990s. However, PPPs have received project-specific engagement rather than it assuming a sector-wide approach. Some of the common reasons for the failure of PPP projects are:

1. **Inequitable risk distribution** among the stakeholders
2. Limited technical capabilities, poorly managed procurement processes, and lack of project structuring

¹ <https://www.indiaspend.com/budget/promise-of-tap-water-to-all-rural-homes-will-need-more-funds-budget-2021-719174>

² <https://www.newindianexpress.com/business/2021/feb/01/budget-rs-50000-crore-allocated-for-jal-jeevan-mission-finance-minister-announces-urban-segment-2258103.html>

³ H.B. Bharti (2019). International Journal of Innovative Technology and Exploring Engineering (IJITEE) ISSN: 2278-3075, Volume-9 Issue-2, December 2019

⁴ <https://www.factchecker.in/in-2030-39-of-indias-population-will-be-urban/>

3. **Tariff concerns or risk in fixed annuity projects**, inequitable financial risk allocation
4. Limited capability of the urban local bodies (ULBs) to implement and track the successful progress of PPPs
5. Traditional models like EPC (Engineering Procurement and Construction), BOT (User-fee and Annuity) do not attract investor interest and have **restricted funding avenues**.
6. Target-based award and service delivery by the private sector partners

Recent trends indicate a growing interest in water PPPs, and more projects are coming under its ambit. Appropriate interventions can help the private sector play a more significant role, especially in investment and service quality improvement. Engaging the private sector on water security is most effective only when it balances water-related business risks and as a business opportunity.

Safe Water Enterprises (SWEs) bring together the communities, public sector, and the private sector to offer a complementary solution for safe and affordable drinking water access to the low-income communities. It is a successful PPP model implemented with various governance models. Correct siting of SWEs in high footfall areas helps the users access the services while making the operations financially viable.

The overarching goal is for all the players is to support each other. It is critical for the stakeholder, for-profit corporations, concessionaires, SWEs, NGOs, and various government authorities, to collaborate seamlessly to improve service delivery and ensure affordability. Some of the key recommendations of this landscape assessment are:

1. **Articulated policies** to allow stakeholders and utilities to strengthen their position to PPPs in the water sector
2. Improving the financial health of municipalities by reducing the NRW and engaging the private sector participation in municipal bond issues
3. **Realistic pricing, guidance on tariff structures**, and performance-linked subsidies can also help improve the sector viability
4. **Sharing of best practices and knowledge transfer** to improve ULB capabilities for robust implementation and monitoring of PPP performance
5. Provide incentives for **new private impact investment** with Government as the outcome funder
6. Innovative instruments of finance with success-fee based models to attract private capital

In the long term, devolving service delivery to the PPPs, developing sector regulation, and competitiveness among the ULBs can strengthen the local bodies' performance to become a focal point on objective tariff settings and targeted subsidies.

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ABBREVIATIONS

AMRUT	Atal Mission for Rejuvenation & Urban Transformation
ATM	Any Time water Machine
BCM	Billion Cubic Meter
BOOT	Build Own Operate Transfer
BOT	Build Operate Transfer
CGWB	Central Ground Water Board
COCO	Company Owned Company Operated
CPCB	Central Pollution Control Board
CWMI	Composite Water Management Index
JJM(U)	Jal Jeevan Mission (Urban)
JNNURM	Jawaharlal Nehru National Urban Renewal Mission
LPCD	Liters Per Capita per Day
MLD	Million Liters per Day
MoHUA	Ministry of Housing & Urban Affairs
NGO	Non-Governmental Organization
NITI	National Institution for Transforming India
O&M	Operations & Maintenance
PBC	Performance Based Contract
PHED	Public Health Engineering Department
PPP	Public-Private Partnership
SHG	Self Help Group
SPV	Special Purpose Vehicle
ULB	Urban Local Body
USWE	Urban Safe Water Enterprise
WRA	Water Regulatory Authority

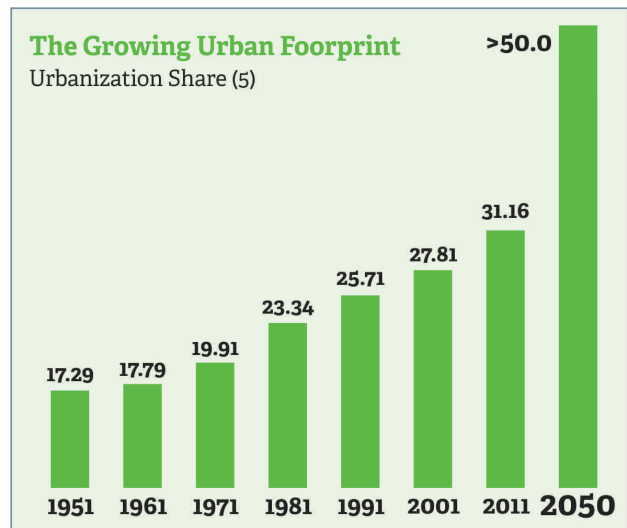
INTRODUCTION

Since the introduction of the “Har Ghar Jal” Scheme (meaning, ‘Water to Each Household’) by the Government of India in 2019, there have been reinvigorated efforts towards ensuring that all citizens have access to safe, potable water at home. Har Ghar Jal is an initiative, introduced under the ambit of the Jal Jeevan Mission, to look at ways to tackle the issues being faced by rural households in terms of access to clean drinking water. Primarily being undertaken by municipal corporations and PHED departments of the states, all the efforts aim to strengthen the piped water supply network and tap into every household. While having piped water supply in all houses is ideal, it is simply not feasible in all areas, such as in slums where there is no space to lay down pipes or areas where there is unplanned expansion. Moreover, water supply should include complimentary, non-piped water solutions through Safe Water Enterprises (SWEs) or water ATMs and water treatment and quality issues. In these areas, as well as to supplement the efforts of the Government bodies, through capacity building, awareness creation, etc. there is excellent scope to develop a partnership between the Government institutions, NGOs, Private sector operators, etc., to augment and bolster the water supply in India by way of SWEs.

Urban Water Landscape in India

In India, population growth and urbanization are imperative, and their effect on the urban water supply is of prime concern for many cities. The burgeoning migratory population in the cities has led to unprecedented urbanization, stressing cities’ infrastructure. This has led to an intricate knot of interrelated stresses on the existing infrastructure and puts pressure on water availability and urban citizens’ quality of life. India’s urban population is expected to reach 600 million by 2030,⁵ more than 50 percent by 2050⁶ fulfilling its water needs will be a significant challenge. The growth rate in the urban and slum populations between 2001 and 2011 was 34 percent and 24 percent, respectively, compared with 18 percent in India’s overall population.⁷

Figure 1. Trend in Urbanization



India's urban population (currently 449 million) has grown by 31.8% in the past decade, compared with the national growth average of 17.6%, and by 2031 the urban population is expected to rise to 600 million people*

42 cities in India have population in excess of 1 million; this number is expected to surge to 68 cities by 2030.

India spends only \$17 per capita every year on urban infrastructure compared to the global benchmark of \$ 100 per capita

*The Global Commission on the Economy and Climate. “The New Climate Economy: Better Growth, Better Climate.” (2014)

⁵ NITI Aayog’s Composite Water Sources Management: Performance of States quoting “World Urbanization Prospects 2018 - Population Division”, United Nations, accessible <https://population.un.org/wup/Download/>.

⁶ Safe Water Network (August 2018). Safe Water Enterprises: Providing Safe Drinking Water for Resilient Cities, page 11.

⁷ Census 2011

Estimates suggest that the domestic sector’s demand-supply gap will stand at ~50 BCM in 2030, with the demand expected to double by that time.⁸ The present situation is also not ideal. Five of the world’s 20 largest cities under water stress are in India, with Delhi being second on the list.⁹ Further, as per the NITI Aayog’s CWMI report, more than 600 million Indians are facing high to extreme water stress, and 75% of households do not have drinking water on their premises. 70% of the water supply is likely contaminated, resulting in nearly 200,000 deaths each year. India today ranks 120th out of 122 nations in water quality.

At present, the Government stress is on piped water supply and spends more than INR 7000 crores (~US\$ 1 billion) annually on water systems rife with operational issues. 30-40% of systems slip back to “partially covered” or “not covered” status due to poor operations and maintenance. Inadequate access to safe water affects health, livelihoods, income generation, and education, especially that of a girl child leading to the cycle of poverty.

Urban Drinking Water Supply:

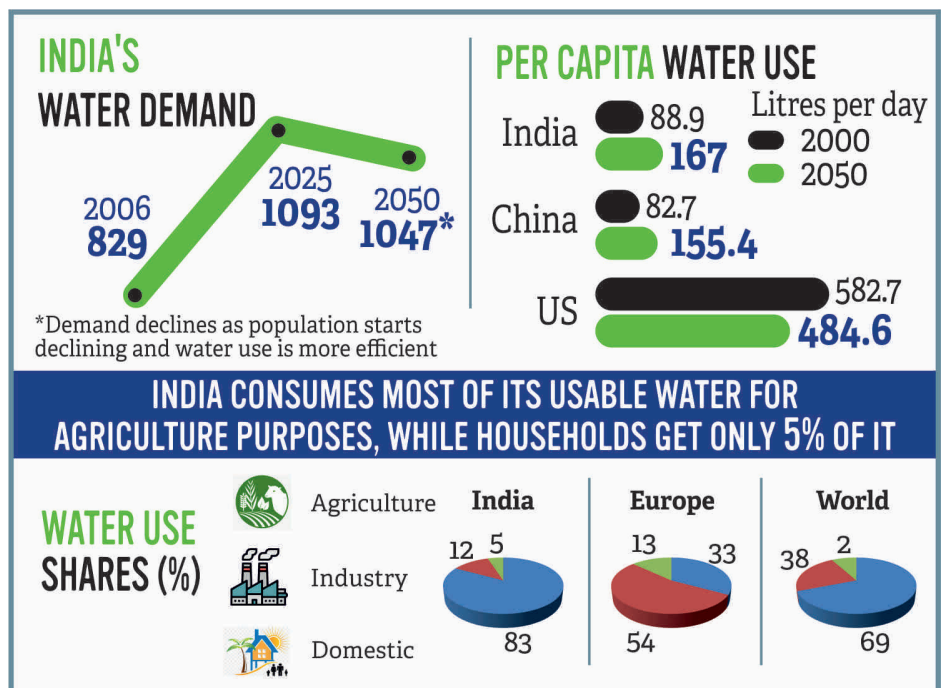
While the Government has set itself a target of providing treated and safe, 24x7 piped water supply at 135 LPCD in the cities, there exist challenges on raw water availability, ageing, debilitated piped water infrastructure, and inability to create new infrastructure in the ever-proliferating urban slums, which are often unplanned.

To meet these tremendous needs and expand their infrastructure in a context of tight budgetary constraints and to improve the efficiency of – often deficient - water systems, there arises a strong need for greater involvement of the private organisations in the drinking water sector.

Addressing the Challenges in India’s water supply

India’s rapidly growing population, especially in urban areas, makes it extremely difficult to plan and provide for water while closing the existing gaps. Access to safe drinking water is essential socio-economically due to its fundamental

Figure 2. India’s Water Demand and Per Capita Water Use



⁸ Charting Our Water Future (McKinsey & WRG, 2009), page 9. https://www.mckinsey.com/~/media/mckinsey/dotcom/client_service/sustainability/pdfs/charting%20our%20water%20future/charting_our_water_future_full_report_ashx
⁹ Robert I. McDonald et al., “Water on An Urban Planet: Urbanization and The Reach of Urban Water Infrastructure”, Global Environmental Change 27 (2014): pages 96-105.

impact on the health of a household by preventing infection, illness and death. Water supply is a focus area for the Government, explicitly providing tapped water to households by 2024. Although providing piped water to each household in regular communities, apartments and societies is the norm, piped water supply in slum areas usually refers to a shared community standpost. Providing water to the houses in such areas is challenging because of their compact nature, the lack of space availability to lay down a pipe network and getting approvals if these colonies are unauthorized.

Water allocation and equity are extremely challenging problems. Due to the large influx of population, mainly due to the cities' expansion, peri-urban areas often lose out on water access to the already established urban population. This trend leads to immense water insecurities due to a combination of issues – urban growth-induced water scarcity, lack of long-term planning, lack of alignment with available resources, and limited regulations to protect the diminishing surface water resources. As piped water supply in even the megacities or smaller towns distributes water for only a few hours per day, those with means can cope by building boosters, storage reservoirs and installing purification equipment. These options are not available to weaker economic sections. They struggle to wait for the water to come or form crowded lines as cities dispatch water tankers to meet needs, especially in the summer months.

In 2001, the urban population was 285 million and assuming the water supply of 135 liters per capita per day, the domestic water demand is estimated at around 38,475 million liters per day (MLD), whereas as in 2011 urban population was 377 million with a domestic water demand of 50,895 MLD.¹⁰ It shows that urban population growth leads to the additional water demand of 12,420 MLD in urban areas. This increased stress on water supply systems is expected to worsen in the next few years. However, as per the Central Public Health and Environmental Engineering Organisation (CPHEEO), the average water supply in urban local bodies is 69.25 LPCD. This indicates a vast gap between the demand and supply of water in India's urban areas.

Apart from access, municipal corporations also must deal with water quality issues. These include adhering to the water quality standards set by the Government, water source quality and contamination. India's groundwater use went from about 7km³ in 1940 to about 270 km³ over the past decade. The groundwater supply is 80% to 95% of rural drinking water, 60% to 70% of the water used in agriculture, and 50% of urban drinking water.¹¹ However, agricultural run-offs carrying fertilizers and pesticides severely affect the groundwater quality causing vast tracts of India to be fluoride and arsenic affected. The fluoride problem exists in 276 districts in 20 states, with Rajasthan and Telangana being critically hit (CGWB). The high fluoride concentration in drinking water causes fluorosis resulting in weak bones, weak teeth and anemia. The fluoride content of groundwater varies significantly. The factors that control such concentration include accessory minerals, fluorite and apatite in the rock mineral assemblage wherein the groundwater is stored, and the environmental factors such as precipitation and evaporation. The effect of fluoride on human health depends on the amount of water consumed per capita per day and fluoride intake in food – leading to dental fluorosis, skeletal fluorosis, and non-skeletal fluorosis and other associate diseases caused due to excessive fluoride ingestion.¹²

As stated earlier, with the acceleration in India's urbanization and growth in consumption levels, there is an increasing demand for urban water supply services. On the other hand, the urban water supply service delivery systems continues

¹⁰ H.B. Bharti (2019). International Journal of Innovative Technology and Exploring Engineering (IJITEE) ISSN: 2278-3075, Volume-9 Issue-2, December 2019

¹¹ Dr. H. Kulkarni (2017). Advanced Centre for Water Resources Development and Management (ACWADAM). Accessed from <https://www.thehindu.com/news/cities/mumbai/the-alarming-levels-of-indias-groundwater/article19253949.ece#:~:text=Giving%20overall%20figures%20for%20India's,50%25%20of%20urban%20drinking%20water>

¹² Saxena K. L. (Dr.) and Sewak R. (2015). International Journal of Engineering Science Invention ISSN (Online): 2319 – 6734, ISSN (Print): 2319 – 6726 www.ijesi.org || Volume 4 Issue 1 || January 2015 || PP.58-73

to be characterized by chronic inefficiencies and poor service quality. The trend is to address the problem of inadequate water availability by creating new assets to augment supply. This is not necessarily effective in resolving the issue and comes with increased costs. Because the pressure to increase the services is so high, there is often little effort to improve services by better managing existing assets.¹³ The limited expenditure towards operations and maintenance has also resulted in the deterioration of the infrastructure over time in several places, negatively impacting service quality and operational efficiencies.

The institutional weaknesses that plague the sector, as mentioned earlier, also exist due to the nature of the institutional set-up for the governance of water supply services, which involve several agencies at the state and local levels. The diversity of agencies presents challenges in differentiating roles and responsibilities and creates problems in coordination. There are also budget constraints due to low tariffs, non-collection of revenue, wastage through non-revenue water, etc. These bodies are too often understaffed or do not have people with the required skill sets, making it challenging to execute large scale projects effectively and is problematic in proper project management. Despite efforts towards ensuring cost recovery, service accountability, and the investments made, adequate water supply service is still lacking. As per the census, there have been improvements; nevertheless, wide service gaps and serious institutional challenges continue to prevail in the sector.

Water Governance in India: Water Policy and Administration

The Jal Jeevan Mission, which aims at providing a tap with drinking water to each rural household by 2024, is the overarching scheme in the water supply. This mission is to be implemented by states and districts and executed through the gram panchayats. This falls under the purview of the newly constituted Jal Shakti Ministry at the national level. In the urban space, at the central level there are several schemes implemented by the Ministry of Housing and Urban Affairs (MoHUA) that are targeted at water supply, including AMRUT (Atal Mission for Rejuvenation & Urban Transformation), Smart Cities and JNNURM (Jawaharlal Nehru National Urban Renewal Mission). Moreover, not all cities are covered by each scheme. Unlike several other infrastructure sectors in the country, such as telecom or power, the urban water supply sector does not have a regulatory agency at the national or state level which monitors the water service provision. In cities, the implementation of water supply falls under the authority of municipal corporations. These overlapping schemes, along with the fact that each city or region has its own set of challenges related to water supply, quality, funding, manpower ability, etc., means that customized solutions must meet the water supply requirement.

As decentralized solutions are needed to augment the existing water supply network, there is space to bring outside players, such as the private sector. There has been increased involvement of the private sector in public services delivery in the recent past, especially in water and sanitation, by Safe Water Enterprises (SWEs). There has been a spurt in the growth of local, regional, and small-scale actors. These SWE players can operate only with the public authorities' approval and co-operation as water is essentially considered a public good. Although there is reluctance from both Government parties and the private sector to work in tandem due to challenges in fixed costs, cost recovery, contract type, accountability, etc.; it is imperative to find solutions and work together to improve access to water and overall water supply management to ensure the citizens' needs are being met at affordable prices.

¹³ [http://mohua.gov.in/upload/uploadfiles/files/Trends%20in%20PSP%20in%20Indian%20water%20sector%20\(Detailed\)013.pdf](http://mohua.gov.in/upload/uploadfiles/files/Trends%20in%20PSP%20in%20Indian%20water%20sector%20(Detailed)013.pdf)

For Safe Water Enterprises to realize their potential in urban space, they need to be included in the urban water policy framework as an alternative solution, along with piped water. Frameworks and institutions are in place to monitor and provide oversight of SWEs. City water programs are regulated by designated water institutions and regulatory authorities for Safe Water Enterprises, including:

- **Urban Local Bodies (ULBs):**
 - o Municipal Corporations (Mahanagar Nigam) that govern cities with >1lac population
 - o Nagar Panchayat governs towns with an 11k-25k population
 - o Municipal Councils that govern cities with a 25k-1lac population
- **Public Health Engineering Department (PHEDs):** Specialized state agencies that plan, design and execute water supply schemes in the respective states and generally operate them.
- **Central Pollution Control Board (CPCB):** Constituted in 1974, under the Water (Prevention and Control of Pollution) Act. It provides technical services to the Ministry of Environment and Forests. Its principal functions are to maintain and restore the country's water bodies and disseminate statistical data on water pollution through water quality monitoring (WQM) and Surveillance activities.
- **Water Regulatory Authority (WRA):** Post liberalization water sector reforms facilitated the transfer of some regulatory powers and functions from ministries and Government departments to "autonomous" WRAs. Setting up a separate authority for water regulation was first adopted in Andhra Pradesh Water Resources Act, the Maharashtra Water Resources Regulatory Authority Act, 2005.

In recent years, there has been a significant increase in the private sector operation in traditionally Government-run sectors, such as transport. Private players have been involved massively in building roads, highways, airports, etc. These initiatives help supplement the Government's efforts and provide services to the people more efficiently as there are joint responsibility and all parties' benefit. Similarly, in the water sector, engaging the private sector through different modalities could help inefficient service delivery without compromising the public interest.

Understanding the Private Sector Players in the Water Supply

There is a wide variety of private players in the water supply sector, including international investors, local and regional actors, small-scale water operators, and larger companies whose purview water may also fall, such as those involved in construction. These operators can be international, national, or local, and the modalities of how joint ventures between them and the public sector would function are also diverse. Besides, there are NGOs and community-based organizations whose incentive systems operate differently than those of the private players mentioned above. Specifically, in water supply, in India and the developing world, small-scale local actors play a significant role in providing customized solutions to make up for the deficiencies in public service provision. The overall players in their way of operations are summarized in table 1 below.

TABLE 1: CATEGORIZING WATER SUPPLY SMALL-SCALE PRIVATE SERVICE PROVIDERS¹⁴

FEATURES	DEPENDENT	INDEPENDENT
PIPED NETWORKS		
System	The operator buys water in bulk from utility and develops distribution sub-networks connected directly to households, institutions and public kiosks stand posts	Operator develops own water sources (wells or boreholes) and connects the network to households and other users
Organization	Private Company or individual, community organization or neighborhood association.	Sole proprietor, cooperative, private land and housing developer, water user association, community-based organization
Regulatory Issues	Contract with utility, business license, customer agreements, bulk rates, customer tariffs.	Groundwater abstraction permits, title deeds, resale permits/licenses, water quality testing, business licenses, rights to own infrastructure and/or to lay networks in public rights of way
POINT SOURCES		
System	Kiosk or stand post connected to the utility network (could be household supply); buying water in bulk - at a special tariff - or at household tariff.	Waterpoint linked to own source (well or borehole, underground or aboveground storage tank) installed privately and operated on a for-profit basis. Water may be purchased from a tanker
Organization	Individual, enterprise, self-help group.	The neighborhood association, microenterprise, community-based organizations
Regulatory Issues	Contract with utility, license/permit, customer tariff, bulk purchase price, performance incentives	Groundwater abstraction permit, license, tariff structure, water quality testing.
MOBILE DISTRIBUTORS		
System	Tankers or truckers obtain water in bulk from the utility (or municipal supply) and deliver it directly to the customer, including public utility water storage tanks, communal cisterns, or individual households and institutions.	Tankers, truckers, or carters develop sources or obtain water from a private well for distribution to households, public utility water storage tanks, communal cisterns, or institutions.
Organization	Sole proprietor, tanker association, lessee, informal sector.	Sole proprietor, tanker association, lessee, informal sector.
Regulatory Issues	Transport license, business license, tanker cleanliness, bulk rate, utility contract, customer tariff	Transport license, business license, water quality, abstraction permit

¹⁴ OECD & IMTA (2008). Optimising Private Sector Participation in Water Infrastructure Draft Checklist for Public Action

Role of Private Sector and reluctance towards PPP models

The Public-Private Partnerships (PPPs) in urban water supply services in India began in the mid-1990s, focused on augmentation of bulk water supply system; rehabilitation, expansion, and the management of distribution systems; and management of water supply from the source to the end consumer – many of which worked, many failed at the implementation stage. These projects are being implemented under Build Operate Transfer (BOT) contracts, short-term management contracts, or long-term contracts with tenures up to 30 years. Further, these projects are being developed with a varied mix of public and private funding. While some projects were dependent on substantive private financing, including the formation of a Special Purpose Vehicle (SPV), several of the active PPP projects today have seen public funding range of 50-60% of the project cost. The private sector's involvement in the provision of urban water supply services was primarily perceived as a move towards privatization of water supply services, with apprehensions about a steep increase in water tariffs.

There has also been a marked departure from the earlier capital-intensive PPP projects with 100% private financing to a substantial percentage of public funding support to water PPP projects in recent times, due to factors such as high financial risks, public water utilities paying bulk water charges to private operators and strong mitigation measures sought by private operators like guarantees from the state Governments leading to increased water tariffs.

However, over the years, a paradigm shift was witnessed in the late 2000s when 60% of the PPP projects focused on improving the water distribution system, 30% on bulk water supply augmentation, and the balance on augmentation O&M of the entire system.

Encouraging more private involvement requires that Governments change their role – no longer directly providing infrastructure services but mastering the new business of fostering competition among private providers, regulating where competition is weak, and supporting the private sector in general.¹⁵ At present, the private sector's role is only in the services related to water supply, be it water treatment, setting up and operating water supply infrastructure, or through Safe Water Enterprises, like kiosks. The private sector includes commercial players, manufacturers of water treatment equipment or infrastructure, service operators, small enterprises, financial institutions, NGOs, etc. The goal of involving the private sector is to reduce budgetary pressure and costs, augment the network, increase service delivery efficiency, capacity building, and ensure long-term sustainability. To reap these benefits, both parties need to have realistic expectations, not hold on to past failed projects and negotiate viable contracts. This can be done by moving towards low-risk contracts (service/management), engaging players with a local or regional presence, and allowing them to operate in multiple roles. This approach will minimize frequently posed challenges:

- High fixed costs coupled with long-term irreversible investments.
- Water is a basic need; access and quality have far-reaching health and social impacts
- Local issues must be addressed with an integrated water resource management approach.
- Complexity and non-uniformity in the sector, due to fragmentation and number of stakeholders
- Risks associated with contracts.
- Risks associated with political changes.
- Pricing while maintaining cost recovery, economic efficiency, equity, and affordability.

¹⁵ World Bank (1998)

Ecosystem of private participants in Water Supply

In addition to the provision of finance, the private sector plays a much broader role in the ecosystem as equipment providers, technology partners, IEC, and knowledge partners.

Figure 3. Mapping private sector participants



Safe Water Enterprises in Water Supply

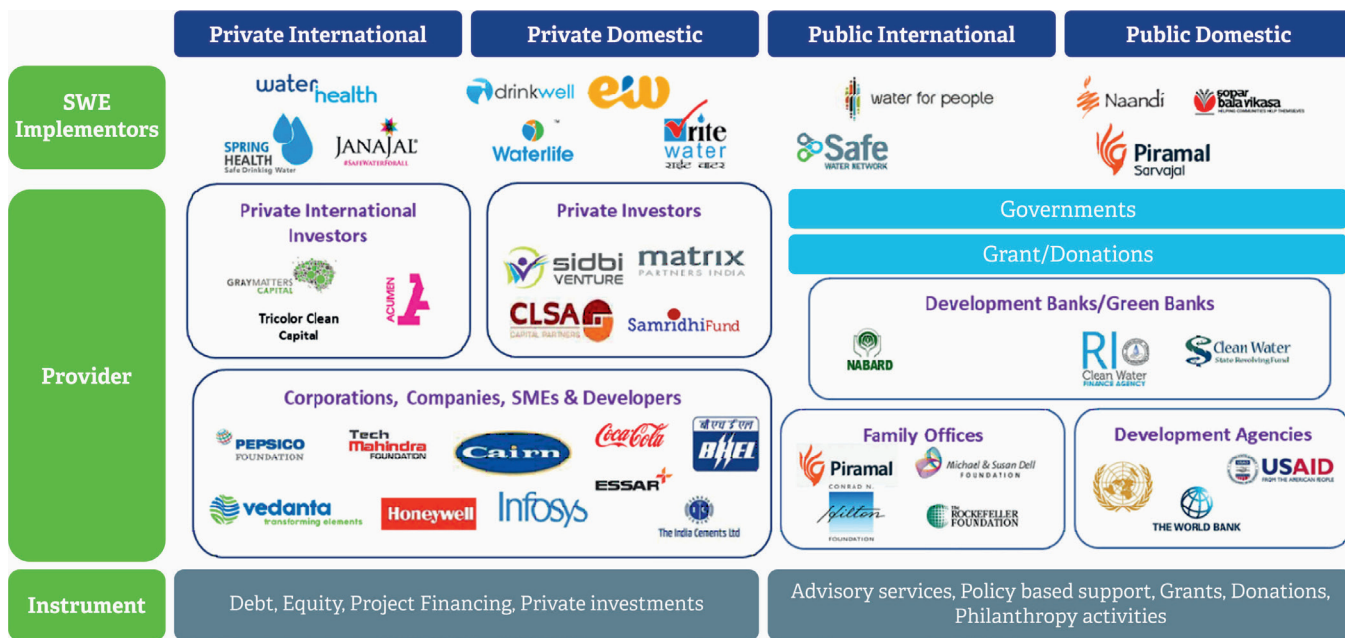
Safe Water Enterprises are different from the usual private sector players in the water supply. Most PPPs refer to relatively large investments in major infrastructure run by utilities. However, in the developing world, especially in the small towns and expanding urban spaces, Safe Water Enterprises are being looked at as solutions to supplement the Government's existing piped water supply. These enterprises focus on providing treated water to communities, especially to those that are not connected to the larger piped network or are underserved by the existing utilities.

These SWEs are becoming increasingly relevant as Governments and citizens seek alternative solutions for accessible, potable water. These enterprises extend beyond the piped water network and provide services at the community level and public spaces.

These include water ATMs, iJal water stations, etc. These coin-operated, fixed-priced water solutions are usually fitted with real-time water quality measuring technology to adhere to the national and local governments' standards and provide a 24x7 water supply for the residents' convenience.

Source, provider & instruments of SWE finance available to Support Water & WASH Projects

Figure 4. Universe of Water Finance



Adopted from: Just add water: a landscape analysis of climate finance for water – Oct 2020.

Urban Safe Water Enterprise (USWE) Governance Models

A range of governance models is available for USWEs to provide affordable drinking water to the urban poor based on various funding management needs and availability. Broadly, there are 3 types of governance/ownership models (Figure 3), each with strengths and challenges as described below. These include i) ULB tendered, Company-Owned, Company-Operated (COCO); ii) ULB Owned, Self-Help Group (SHG) Managed; and iii) Philanthropic Funded, SHG/NGO Managed. These models affect the functioning of the USWEs and the community’s response to trial and acceptance of the solution. Requirements for these models’ success include financial viability of the SWE with incentives for all participants in the value chain; a maintenance reserve to cover replacements, affordable pricing, and consumer activation to ensure demand; financing to cover capital investment; and operational capacity to ensure effective management.

Figure 5. SWE Governance / Ownership Models

	ULB tendered, company owned company managed (COCO)	ULB owned, SHG managed	Philanthropic funding, SHG/NGO managed
STRENGTHS	<ul style="list-style-type: none"> • Integrated value chain • Prompt service and maintenance • Operating training easier • Allows for cross subsidy • Higher control over operations • Single point accountability for the ULBs 	<ul style="list-style-type: none"> • Credibility of SHGs makes it easier to increase consumer awareness, generate demand • Savings directly proportional to the revenue and this keeps SHGs motivated • Lower overhead costs at SHGs are not appointed on salary basis 	<ul style="list-style-type: none"> • Selection of site can be done on the demand/ requirement • Could innovate flexibility with respect to programs and demand generation • Pricing and programs could be customized as per the required local conditions • Involvement of local NGO triggers interest and response from the consumers
CHALLENGES	<ul style="list-style-type: none"> • These are assigned via tenders which favor lowest price bidder due to which only the technology providers/ equipment manufacturers are selected for large scale government contracts • Lack of collaboration between ULBs and SWE Implementors in risk sharing & awareness programs • Higher pricing needed for financial stability & Higher overhead costs • Operators are salaried and hence lack motivation 	<ul style="list-style-type: none"> • Operator lacks training and pends on equipment providers for repairs/training • Lack of contingency planning for maintenance breakdown • Low volumes could discourage SHGs • Cross subsidy not possible • Limited Resources for local capacity building 	<ul style="list-style-type: none"> • Dependency on philanthropic funds for scaling • Lack of oversight from the ULBs • Need to bear additional costs of land, raw water • Raw water availability might not be easy

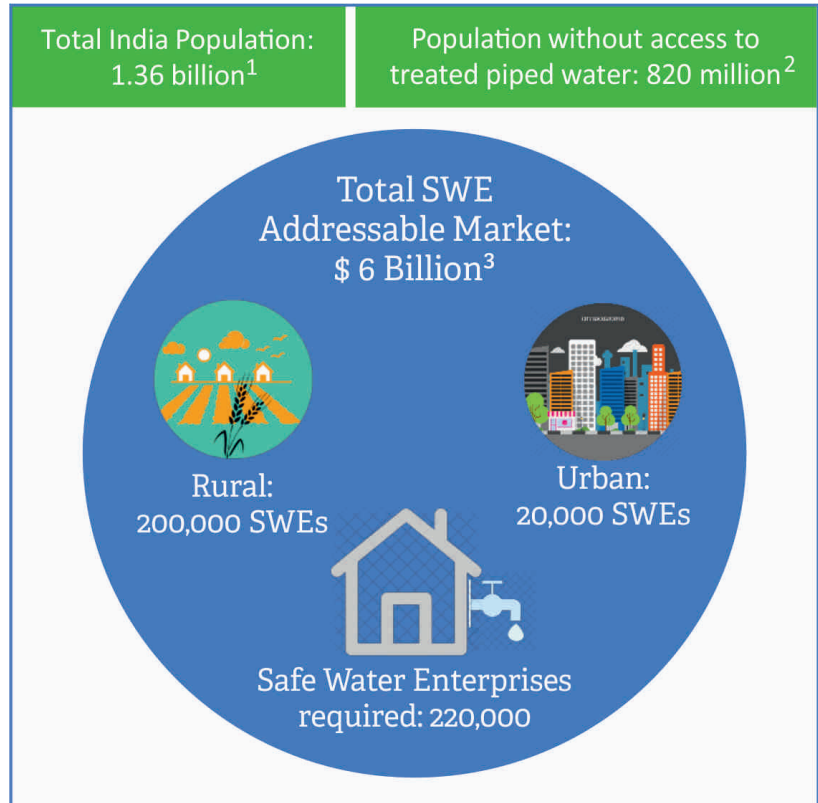
Source: Small Water Enterprises: Providing Safe Drinking Water for Resilient Cities. Safe Water Network India Report, August 2018.

Funding for Safe Water Enterprises

The SWE sector requires operating subsidy, much like the large water sector nation-wide, to enable low pricing in quality-affected communities that lack access to treated piped water. For over a couple of decades, entrepreneurs, impact investors, governments, and philanthropic organizations have deployed and refined these SWE solutions that complement traditional piped water. In India, there are more than 30 SWE implementers operating in the rural and urban spaces that have collectively established ~ 50,000 SWEs, of which ~ 5000 are in urban areas and on railway stations.

While the new Jal Shakti Ministry is focused on water, both upstream, middle, downstream, and retail connectivity, culminating in what is called the ‘Nal se Jal’ – ensuring that by 2024, every household will have piped running water, potable water, there is an urgent need that the Government budget is allocated to SWEs and mainstream them as are liable source of potable water. The water sector will have a significant multiplier effect because it will also broadly involve a huge degree of labor deployment, leading to a strong job multiplier effect.

Figure 6. SWE Market Potential for Private Sector Funding



Source:
 1. United Nations Population Fund; 2. Niti Aayog CWMI 2.0;
 3. India Sector Review(2018). Safe Water Network

PPPs in Safe Water Enterprise Sector

Private sector engagement in SWEs has been limited to either being implementers as part of Government tenders/ profit-making organizations or as CSR partners, providing the much-needed capital funding to the starved fund sector. This section discusses traditional and new-age innovative operating models of private sector engagement, which can attract more significant funding to close the gap in the water sector. In a separate section, we further discuss the risks and mitigation strategies for each of the operating models and create an enabling environment for adopting these models in the sector.

Traditional Operating Models for SWEs

The three models that are widely employed for SWEs for PPPs include Contract based models (BOT and BOOT), Company Owned and Operated (COO), and Company-owned, community-operated (COCO). Figure 4 shows some examples of the types of enterprises found across this spectrum of organizational forms:

Figure 7: Examples of types of enterprises







<p>Contract-based model: In this model, the Government is the owner, and the private sector acts as a contractor. These projects are awarded based on a competitive bidding process.</p> <p>Build-Operate-Transfer: The private sector partner builds infrastructure matching tendered specification, operates the project for a specified period, post which it is transferred to the community (public sector entity). The Government predetermines pricing.</p> <p>Build-Own-Operate-Transfer: Like the BOT model, allowing the private sector partner to factor-in depreciation cost into water tariffs as the assets are owned by the entity, thereby encouraging private investments.</p>	
<p>Company Owned & Operated: In this model, the private partner owns and operates the venture by funding, installing, managing, and maintaining the project. These are privately held, for-profit organizations with a motive to earn but with a social focus objective.</p>	
<p>Company Owned- Community Operated: The Social Entrepreneur model, the initial capital expenditure (Capex), and start-up costs are usually funded through grants from corporates, multilateral organizations, or other philanthropic sources and facilitated by a not-for-profit organization. The community contributes to the land, building, or other immovable assets and plays an essential role in installing and operating the plant. The surplus from operations is used for operating expenses and to support other major community initiatives. Involvement of the community builds a sense of ownership and active participation.</p>	

Each of these has different characteristics in providing initial Capex investment, who maintains it, who regulates the prices, the risks for the contracting authority and the contractor, who collects user fees, and the project impact envisaged. All these factors for the listed models are summarized below:

Each of these models carries a different set of risks for the Private sector and the Public authority (refer to graphic). Further, the risks can be transferred as well as mitigated through contractual terms. Before entering any contract, the risks should be:

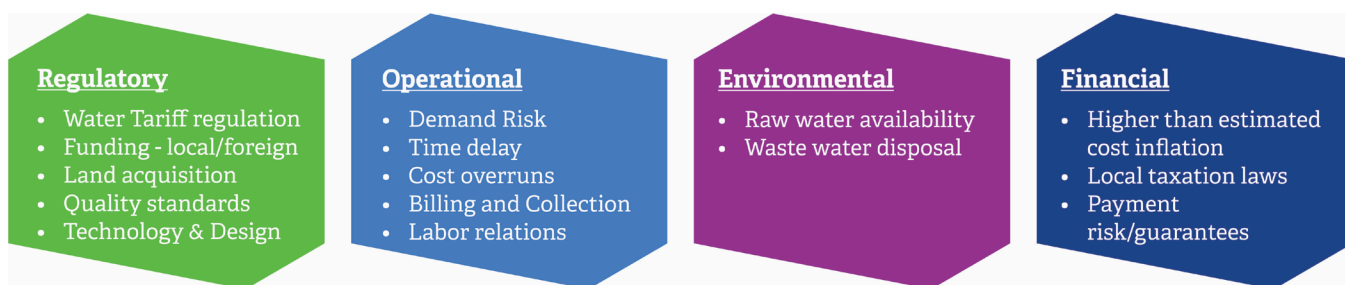
- Mapped for their likelihood
- Financial impact evaluated
- Allocated among stakeholders
- Mitigation strategy outlined, if possible
- And a priority rating assigned

Figure 8: Traditional private sector engagement models

Comparative Analysis	Engineering, Procurement, and Construction (EPC)	Built-Operate-Transfer (BOT) – User fee	Build-Operate-Transfer (BOT) – Annuity	Hybrid Annuity Model (HAM)	Social Entrepreneur Model (w/Entr/SHG/Com)
Investment 	Government	Private	Private investment for construction and balance deferred payments	40% Government and balance deferred payments	Land – Social Entr Equipment – Philanthropic capital
O&M 	Included in contract as concessionaire’s responsibility				Independent Service Entity (paid out of rev)
User Fee – Collection 	Awarding authority	Concessionaire/ Private developer	Awarding authority	Awarding authority	Affordable pricing to cover OpEx
Funding from financial institutions 	None	Majority funded by FI’s	Substantial funding from FI’s	Up to 40% of the project cost	Limited
Ease of contract management 	Comparatively simple and easy to administer	Requires constant monitoring			Scalable and Replicable
Project Impact 	Low tender pricing, little focus on capacity building, results in higher slippages				High – community buy-in

Safe Water Network, India Sector Review, 2018.

Figure 9: Risk Mapping



Funding in the Water Sector

The Indian water market is \$ 30 billion sized. By 2030, this potential shall revolve around four key themes: equipment supplies, public-private partnerships for water supply and distribution, water treatment plants and water EPC (engineering, procurement, and construction), business, and integrated water resource management for utilities.¹⁶ The water sector will have a significant multiplier effect because it will also broadly involve a considerable degree of labor deployment, leading to a beneficial job multiplier effect.

¹⁶ https://yourstory.com/2013/10/7-firms-investing-in-indias-water-sector?utm_pageloadtype=scroll

TABLE 2. PROJECTS FUNDED BY CORPORATES IN THE WATER SECTOR¹⁷

Project Name	Corporation Name	Location	CSR Budget	Project Details
Watershed Program	Housing Development Finance Corporation Limited	Delhi (New Delhi), Maharashtra (Amravati, Beed, Latur, Palghar, Satara, Wardha, Yavatmal)	INR 11.91 crores	Provision of clean and safe drinking water through community-based water centers
Water and Sanitation Initiative	Maruti Suzuki India Limited	Haryana (Gurugram, Rohtak), Gujarat (Ahmedabad), Karnataka (Bengaluru)	INR 14.98 crores	Working with community and sarpanches in the village to improve its water and sanitation conditions
Swaksh Jal	Northern Coalfields Limited	Madhya Pradesh (Singrauli), Uttar Pradesh (Sonebhadra, Bhadohi)	INR 32.46 crores	<ul style="list-style-type: none"> • Installation of hand pumps in the villages to provide safe drinking water. • Construction of ponds, deepening of existing ponds, and dam checks. • It has installed 460 hand pumps, created one pond and two check dams, and deepened 13 existing ponds.
Water for Public Good (Under Water Conservation Project)	Hindustan Unilever Foundation (HUF)	5,000 villages in 51 districts, ten states, and two union territories across India	INR 8.95 crores	<ul style="list-style-type: none"> • Water conservation, building local community institutions to govern water resources and enhancing farm-based livelihoods through adopting judicious water practices. • Farm-based livelihood initiatives have created over 700 billion liters' water-saving potential, generating over 0.80 million tons of additional agriculture production and around 75 million-person days of employment.

¹⁷ CSR Box Report and indiaccsr.in; FICCI

Safe Drinking Water and Sanitation	Cairn India	Rural areas in Rajasthan	Details not Available	Sets up water kiosks using RO technology to provide safe drinking water to the rural population near the Company's operational vicinity.
Strengthening Livelihoods	L&T	Rajsmad district in Rajasthan, Ahmednagar district in Maharashtra, and Coimbatore district in Tamil Nadu. Seva Mandir and Arpan SevaSansthan in Rajasthan, Watershed Organisation Trust (WOTR) in Maharashtra, and National Agro Foundation in Tamil Nadu.	Not Available	<ul style="list-style-type: none"> L&T identified four like-minded partners in these areas – Seva Mandir and Arpan SevaSansthan in Rajasthan, Watershed Organisation Trust (WOTR) in Maharashtra, and National Agro Foundation in Tamil Nadu. Emphasis was laid on the efficiency of implementation, communities, detailed review of deliverables, and measuring progress towards outcomes.

Finance is the enabler that makes PPP projects a reality. Table 3 enumerates below various financing modes categorized by impact level and details of funding mechanisms and organizations that piloted or used these funding methods.

TABLE 3. FINANCE FOR WATER

IMPACT	Nature of Financing	Organization	Funding Mechanism	Details
COMMUNITY LEVEL IMPACT	Upfront Funding of Capex through Micro-Loans	Water.org https://water.org/	Mechanism Provides upfront domestic capital which is lent to households to build their water & sanitation needs	Water.org helps lower-income households, community-based utilities become bankable. To ensure consistent access to capital, Water.org has formed water-focused funds of various sizes. The microfinance sector, banks, SHG organizations are active participants
	Donor funded Capital and start-up costs.	Safe Water Network https://www.safewaternetwork.org/	Local entrepreneurs contribute to the land, renovation costs, and the NGO (SWN) alongside providing the Station, covering start-up costs.	Trains local people to manage community-run safe water solutions.

		Charity Water https://www.charitywater.org/	Charity water collects money from private donors to fulfill local water, sanitation, and hygiene projects in developing counties through locally-based partners.	These NGOs follow a planning, implementation, post-implementation process where donors know about their finance distribution.
CITY LEVEL IMPACT	Loan funding with guarantees	Water Finance Facility (WFF)	Financed by borrowing money from the local currency capital markets	Water Finance Facility mobilizes large-scale private investment from domestic institutional investors, such as pension funds, insurance companies, and other qualified investors, by issuing local currency bonds in the capital market to finance clean water and sanitation infrastructure for more people in developing economies. They work with guarantees in Sweden, USAID, etc., to an acceptable level to investors. There is an in-between fund (trust) where the security is placed, and then the fund goes to the water companies.
	Non-fund-based Technology support	Water-Gen https://www.watergen.com/	Provides technology that converts humidity in the air into drinking water	Work to address the issue of innovation and technology that go together, to solve a shortage in clean, safe drinking water
STATE LEVEL IMPACT	PPP investments in water infrastructure	Government-funded projects collaboration. (Govt of Maharashtra)	Public spending or tax money on the water goes towards the construction of dams, aqueduct, water pipelines, water meters, drainage treatment facilities, canals, and their engineering, construction costs	Scope for partnerships in Government-funded projects to collaborate with the private sectors

<p>NATIONAL LEVEL IMPACT</p>	<p>Sovereign Investments</p>	<p>Sovereign Wealth Fund (SWF)</p>	<p>Independent Government-run investment of a country formed by its surplus reserves.</p> <p>Includes various assets under management (AUM), such as shares, bonds, property, or other strategic classes.</p>	<p>SWFs finance foreign water infrastructure projects to diversify towards a renewable energy source, protect the domestic economy from over-emphasis on non-renewable resources, increase savings for future generations, or even exercise political ambition. Between 2015–2018 the size of green investments by SWF rose to USD 11 bn and specifically to the extent of USD 2.2 Bn in green infrastructure funds. By 2017, emerging markets represented 30% of total SWF for infrastructure projects.</p>
<p>REGIONAL LEVEL IMPACT</p>	<p>International water Co-operation</p>	<p>Strategic Foresight Group</p> <p>(Blue peace process is a means to promote peace through transboundary water co-operation of shared water resources)</p> <p>https://strategicforesight.com/</p>	<p>The Blue Fund is designed to cover overhead costs in water-based projects (lakes, rivers, and aquifers), emphasizing regional ownership of projects. In doing so, water projects should focus on attracting a capital cost.</p> <p>An innovation that maintains the principles of blended finance at its core.</p>	<p>It aims to use public and philanthropic capital or development finance to catalyze private investment or additional finance for sustainable development in developing countries.</p> <p>Currently, a Congo Basin Blue Fund is being designed among countries in the Congo Basin.</p>
<p>INTERNATIONAL LEVEL IMPACT</p>	<p>Green Bonds</p>		<p>Fixed-income securities issued by the public and private sector that finance or re-finance projects with environmental benefits such as water</p>	<p>USD 19.45 Bn (2017) and USD 20.1 Bn (2018) is the size of labeled green bonds issued for water as per the data available with the climate bonds initiatives</p>

	Exchange-Traded Fund (ETF)		Type of security that involves a collection of securities such as stocks that tracks an underlying index. (for the water industry, investment is an equity class)	Water ETFs amount to USD 2.80 Bn globally. https://www.etf.com/channels/water-etfs
	Green Climate Fund	Set up by the United Nations Framework Convention on Climate change in 2010	Raise and direct finance towards projects that will have positive climate outcomes in developing countries	Direct communication between the fund provider (industrialized country) and the recipient (developing country) through the GCF board structure. The fund has supported water & water infrastructure projects totaling USD 1.5 Bn across 49 countries, covering 19 facets of water in 45 projects, such as water supply, hydro infrastructure, flood control, drinking water, etc.
	Blockchain technology (tokenizes assets)		Asset-backed tokens managed on a blockchain network: Assigns a unit of economic value to a physical asset or financial instruments in the form of a digital token or converts the rights from a physical asset into a digital token.	Crowdfunding: The cost of a water infrastructure project is calculated, after which the owner/s of the project can tokenize a part of the project to raise capital from retail investors. It increases liquidity for both the asset owner and investor. Combining blockchain with IoT, costs can be reduced to significant levels.

* Adapted from <https://medium.com/climate-conscious/buffet-of-finance-for-water-9e8450b7ec35>

CSR – Funding thrust for PPP funding

Corporate social responsibility (CSR) funding has provided the needed thrust to PPP investments. CSR and sustainability today are strong trends globally and have experienced a significant and constant conceptual evolution in recent years.

Swachh Bharat Mission that sought active participation from the corporate sector to tackle the health and sanitation issue received an enthusiastic response from the Corporate sector; many leveraging Section 135 of the Companies Act, 2013, which introduced mandatory Corporate Social Responsibility (CSR), to contribute to the campaign. Below is a list of the top 5 public and private sector companies with enormous WASH budgets with enormous budgets mostly targeted for sanitation.

TABLE 4. TOP WASH SPENDERS

	VENTURES			
TOP 5 PSU's companies with the largest budgets in the WASH sector*				
TOP 5 Private companies with the largest budgets in the WASH sector*		 		

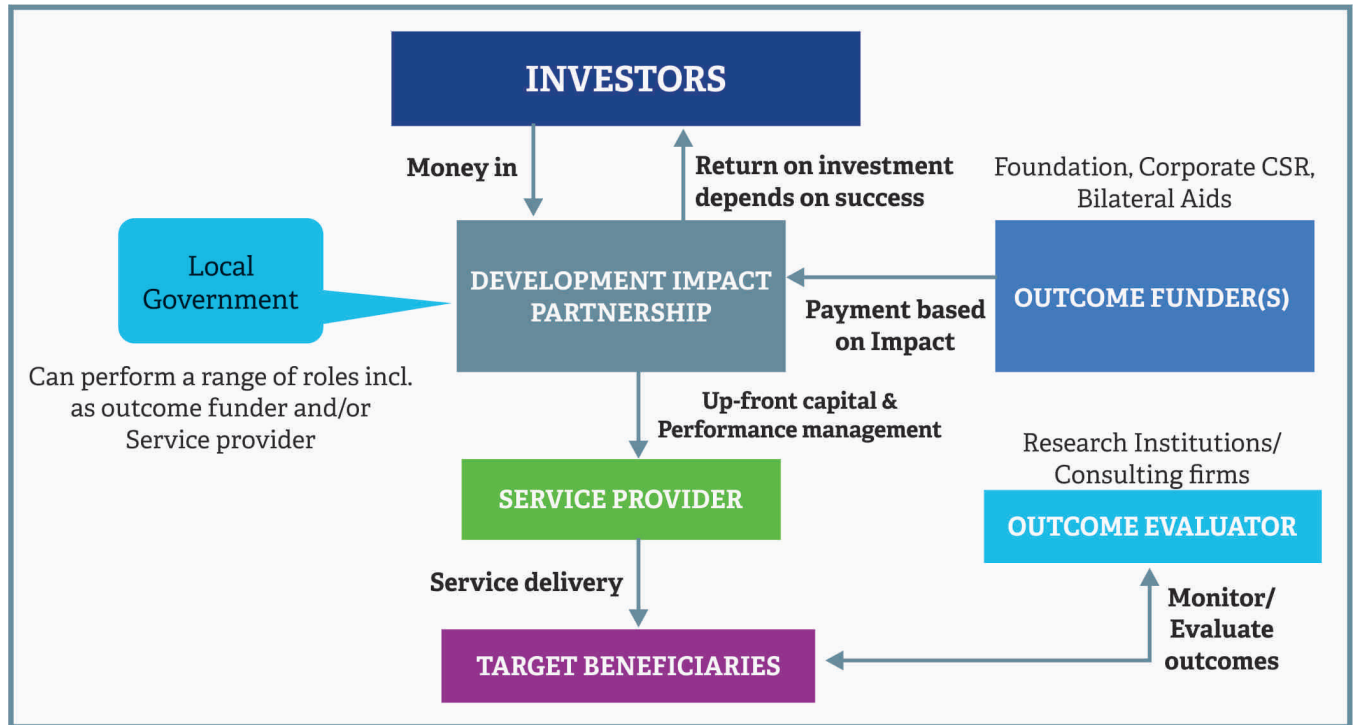
* CSR efforts in WASH by the 100 companies with the largest CSR budgets on the BSE 500.

Private companies today are inspired by its large vision to put the 'Nation First.' They have adopted a comprehensive CSR policy outlining measures to undertake projects and activities for making a significant impact in their WASH budgets.

Impact Bonds - Innovative Financing Vehicle for PPPs

Impact bonds have gained momentum in recent years because they offer an opportunity to translate socially desirable goals into measurable economic returns. Impact bonds are highly structured products that require collaboration between multiple stakeholders, quality data collection, and a sophisticated and stable legal framework. Thus, it can be challenging to implement in low and middle-income countries. The Impact Bond structure means that awarding authorities only pay when agreed outcomes have been achieved and that implementers are provided with working capital by socially motivated investors. Figure 9 below demonstrates a typical structure for such an instrument.

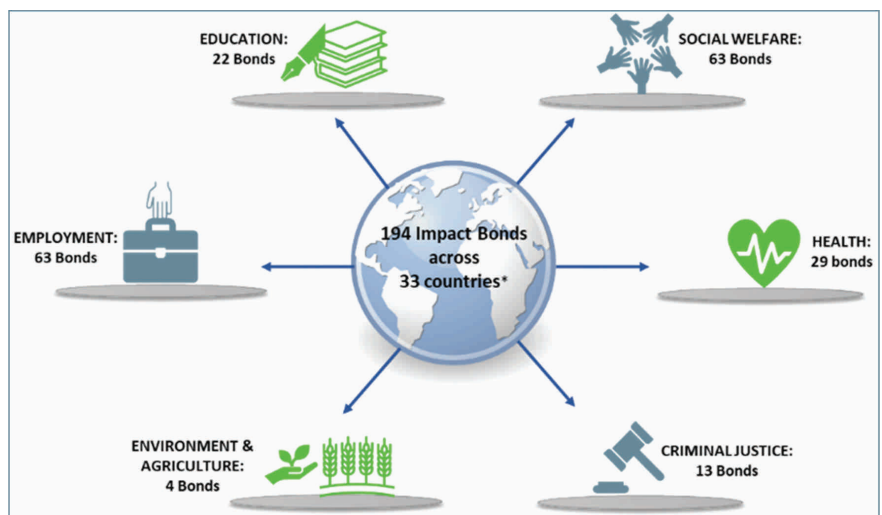
Figure 10: Social Impact Investors/HNI's



Impact bonds are a subset of sustainable development bonds, which are debt securities issued by private or public entities to finance activities or projects linked to sustainable development. Bonds can also be differentiated by the nature of their return or focus sector.

The most common instruments are Green Bonds, Microfinance Bonds and Charity Bonds, Social Impact Bonds, Development Impact Bonds, and Environmental Impact Bonds. Social Impact Bonds (SIB), Development Impact Bonds (DIB), and Environmental Impact Bonds (EIB) share the same mechanism. Private investors invest in a social (SIB and DIB) or environmental (EIB) service provider who, if successful, delivers both social value and public sector cost savings. In the case of a SIB, the local Government repays the investors (principal + interests) according to the project's success. For a DIB, a development agency or a charity foundation repays the investors as the

Figure 11: Impact Bonds Snapshot By Sector



*Social Impact bonds: 183 & Development Impact bonds: 11
 Impact Bonds in Water Sector are few and mostly focused on Sanitation.
 Source: Brookings Institution Global Impact Bond Database, Jul 2020

Government of a developing country cannot afford it. The highest number of SIBs can be found in their country of origin. The U.K. Additional SIBs are increasingly designed and implemented in Europe (The Netherlands, Belgium, Germany, Austria, and Portugal), the United States, and Australia.

Impact bonds have been contracted in developing countries out of 194 global impact bonds¹⁸. In India, with three contracted deals and several more in design, there is an appetite for using impact investment across various social sectors, including health and sanitation, increasing power reach, and reducing malnutrition.¹⁹ The Impact bond market is currently primarily driven by international foundations on the investor and outcome funder side. However, a lot of movement has been built around creating a landscape and supporting ecosystem that hopes to serve an investment intermediary's function in creating a pay for success product.

Conclusion

Impact bonds are still in a nascent stage globally and particularly in developing countries. However, with 194 impact bonds contracted worldwide, the stakeholders have learned the Do's and Don'ts and what sector and geography works. To expand the scale and reach of impact bonds, there is a need to expand the evidence base, build capacity for the service providers, educate the potential outcome funders, and potentially impact investors and have supportive legislation. As impact bonds and the pay-for-success model gains further momentum, we feel it can generate greater interest from the private sector to participate in a key infrastructure sector like water and contribute to the SDG 6.1.

Learning from past models

Private sector involvement in the water sector is not a new concept, and since the 1990s, there has been an increase in the number of PPP projects initiated or awarded. Some of these models were successful, whereas others failed. The stories of failure often also create a reluctance to participate in Government private collaborations. It is essential to understand why certain projects failed, what worked, and account that both the water sector and the private players have evolved significantly since then. New modes of co-operation or engagement can be considered

1. The focus has to be on service & end-user experience and the assurance of bulk water at the start of each project.
2. Prior projects have cited failure due to the lack of data available on the existing infrastructure. Lack of data resulted in additional distribution estimates, making the committed funds inadequate. This is a significant risk for PPPs.
3. PPP design and monitoring are not always consistent; the consequences of not meeting the targets, or standards outlined in the contracts, are either too weak or too unrealistic²⁰. There has to be real incentive to perform as well as recourse for poor service performance.
4. It is key to address the sustainability of operations in the PPP design. It is essential to ensure that the PPP design is part of an overall framework to ensure long-term financial sustainability and viability of water supply to the city and for the PPP.
5. Institutional roles and responsibilities have to be laid out clearly to prevent the fragmentation and overlapping functions from interfering with the project implementation.

¹⁸ Brookings Impact Bonds Snapshot – July 2020

¹⁹ Impact Investors Council. (2016). Social Impact Bonds (SIBs) and representation for requisite changes to facilitate SIBs in India. White Paper

³ The promise of Impact Investing in India – July 2019. Whitepaper

²⁰ <https://openknowledge.worldbank.org/bitstream/handle/10986/18738/ACS87670ESWoWh00Box385252B00PUBLIC0.txt?sequence=2=y>

6. In case of reliance on external grants or public agencies, there has to be some financial alternative and flexibility in case of delays in fund release, expansion of the work scope, etc.
7. There appears to be market demand for PPPs, which can be catered to by better project preparation, addressing potential risks, and strong, standard prequalification standards to foster competition.

The Government and the private sector should enter into PPP for water supply after carefully considering the project's eventual goal and a holistic understanding of how the project can be made viable and integrated into the overall plan. The two primary considerations ought to be:

1. **Cost-benefit analysis:** should be undertaken, including the alternative delivery options, the state of infrastructure, actual costs, and benefits that would be accrued over the project lifecycle. The reasoning to enter into any PPP in water is tied with delivering a basic human need and the impact on the people's health. Considerations could include limited capacities where the private sector can add value while the Government remains in charge of the basic regulatory and oversight functions. Other factors to address include sustainability analysis, choice of technology, current infrastructure, etc.
2. **Financial sustainability:** This is especially important when entering large infrastructure projects where the costs are irreversible, and there is a need to balance cost recovery and affordability of water supply. The price set should allow the operator to achieve cost recovery. An optimal mix between price cap and return regulation rate can provide incentives to improve efficiency; progressive tariff structures can favor water conservations and improve recovery, etc.

Incentivizing private sector participation through risk mitigation

As mentioned earlier, despite the revenue potential and the benefit to the citizens, the private player's significant reluctance to enter PPPs is the nature of risks involved. While some risk will always be there, basic steps towards risk mitigation can be taken through transparency, timelines, payment assurances, etc. Some steps towards risk mitigation are suggested below:

One of the major challenges private players face when entering PPPs is the lack of comprehensive and updated information that is key to the project.:

- **Pre-bidding information:** even before the bidding begins, the private player needs to access information to decide whether it would be appropriate to bid. This is critical in determining capital investments, O&M costs, and expected revenues. Such data includes details of existing assets and their condition, materials, age, and repair history. Unfortunately, ULBs or municipalities do not always have this information at hand, or it tends to be outdated. However, this is critical, especially if the private player is taking the project's financing risk. This information becomes even more critical in a concession contract where a private operator assumes financing risk. Hiring a third party to ensure this information is available to all bidders makes the process more viable. Such technical information would also include a detailed understanding of the area, the properties, number of connections, project population, bulk water allocation, network distribution, storage reservoirs, and non-revenue water, billing, and collection assessments.

- **Clarity on assets:** Assets, especially land, is a key factor in projects and often leads to delays. It must be made clear from the outset if additional land is acquired, who would have the authority, the timelines, etc. This is becoming even more important given the lack of available space in crowded cities and burgeoning towns with various service lines taking up space. Asset ownership and rights need to be clear before bidding for any contract. These assets also may need to be pledged to lenders. Operators also can subcontract the work rather than everything being regulated by the municipal body.

Certain payment guarantees are also required to ensure viability and interest in a project and reduce other financial risks.

- **Payments to the operator are often linked to tariff increases and adequate connection charges.** As most municipalities do not have the resources to meet this, some form of guarantee is required. Such a mechanism can be devised to assuage the financial investor or developer, such as escrow of water charges, diverting other revenue, etc. It is unlikely for a private player to take up a project if the viability is dependent on future increases in water tariffs. This is a hot topic and is influenced by various external factors.
- Moreover, consumer resentment and protest at the increase of water tariffs and collection lie with the municipal authority; this is often not or cannot be delegated to the private operator. The process of fixing and collecting the water tariffs should be laid out clearly to ensure cost recovery. Even if an operator is willing to take the risk of collection, strong legal and administrative support would be required to address non-collection and default in payments. This would also apply to the cases of illegal use and unauthorized water connections.
- **Capital Risk:** Long term contracts, especially related to distribution, will eventually require capital investments to account for the increasing population and consumers. It should be clear who is to bear the risk, if it is to be shared, etc. If the private player is expected to make the investments, a clear-cut cost recovery mechanism should be worked out.
- **Performance Security** is often sought from the operator so that the municipal authority may deduct in case of default or delays. This should be precise and good faith; the goal should be to penalize for genuine failures on the operator's part and not for trivial issues.

Providing flexibility in the operations and management of a project can also go a long way in encouraging private players to enter a PPP.

- As mentioned in the preceding section, revenue collection can be a challenging task, and the powers around this are usually bestowed to the municipal authority. However, to function profitably, there must be a mechanism to disconnect customers and reconnect on the payment receipt. The Contract should specifically layout provisions guaranteeing these rights to the operator.
- Not all risks or clauses can be predetermined, and some conditions are ideally stipulated based on the nature of the project and the municipal authority, and the operator. For greater operational efficiency, bidders should have an option to negotiate the terms during the bidding process. This is common in international PPP projects and allows for concerns practical issues to be addressed.

PPP contracts for accountability and efficiency

As mentioned above, transparency and information sharing is key in risk mitigation in PPPs. Lack of accurate data is a significant risk for water PPPs. Public agencies should explore contractual approaches that incentivize the operator to cope with this risk. This could include more detailed project preparation, in which operators assume a role, providing incentives to the operator to maximize service standards within the initial budget. Contracts could also explore clauses that permit changes in scope or service standards to cope with increased costs or to include a contingency fund. It is reasonable to expect that brown-field water PPP contracts may require adjustment or even renegotiation, given that they are awarded in the context of poor data relating to the existing system and inadequate preparation. A credible and transparent mechanism would help address this issue during implementation; in the absence of this currently, public sector officials are reluctant to exercise judgment to resolve issues objectively, and stakeholders perceive any adjustment negatively. PPP designs should incorporate adequate incentives for the operator to optimize capital expenditure or draw out rigorous technical expertise, creativity, or innovation to address the challenges of service delivery in the context of existing Indian cities. The contracts should seek to balance public objectives such as optimizing capital investments and applying technical skills, expertise, and innovation and underwriting risk for the private operator to maximize the impact of available funds.

The objectives should determine the PPP choice, and these should be laid out through specific contractual commitments. This form of enforcement is key to achieving PPPs' primary objective, leveraging private sector efficiency. Robust institutional mechanisms to monitor performance should also be put in place. Additionally, balanced assessment and treatment of risk-sharing and standard clauses for tariff, change in law, compensation in the event of termination, arbitration, etc., can help clarify. Following well-established principles for standard commercial risks is likely to increase bidder participation and improve the sector's competitiveness.

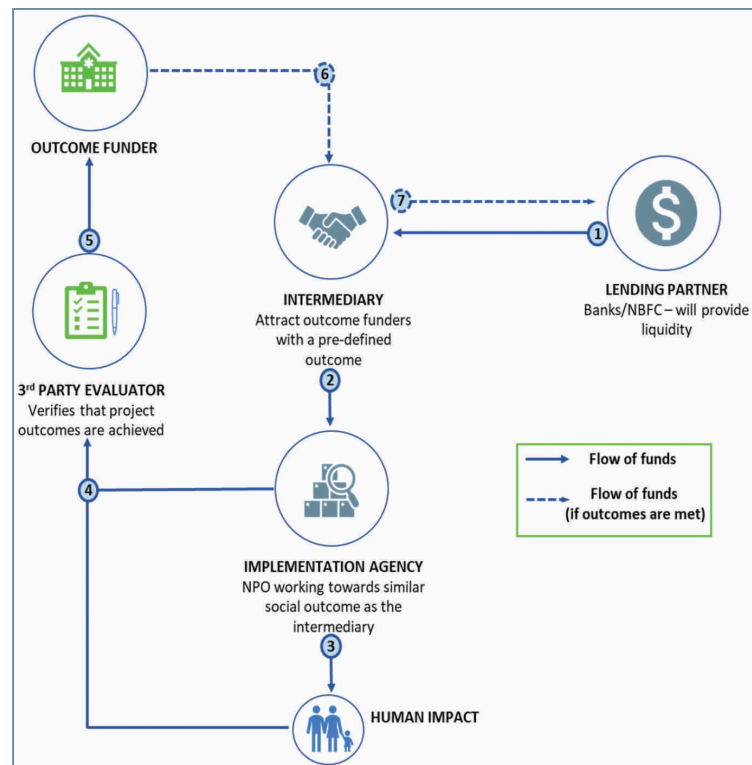
Trends in PPPs

PPPs are evolving to mitigate the risks discussed earlier in this paper and ensure greater accountability for all parties while ensuring that they have access to the highest quality of services available. The favored models now are summarized below:

1. **Performance-Based Contracts (PBCs)** are useful for specific service or activity related work as payments are based on achievements of measurable outcomes. Public sector is responsible for operations while the private sector brings in subject matter expertise. Knowledge transfer and capacity building of the municipality or Government bodies workforce are also key elements of such contracts, which are key in ensuring the operations run smoothly once the private player's Contract ends.
2. **Performance/ output-based** management contracts usually involve the management of the utility being outsourced to a private operator. Some other models have the private player bringing in technology, expertise to work alongside existing management. These also require achieving specific targets or goals. A typical Pay-for success model has the following **structure**:
 - A lending partner would provide upfront capital investment (multi-year unsecured lending facility)

- **The intermediary** would structure, co-ordinate and fund the Implementation agency to create social impact.
- **The implementation agency** would deliver services to the beneficiary (Human impact), resulting in direct or indirect benefits due to the projects' primary or secondary objectives.
- **3rd party evaluator evaluates** whether the outcome is achieved.
- **Outcome funder** (Government) who is willing to pay for a predetermined set of outcomes will receive and validate the objectives of the project

An initial portion of the funds from the outcome funder can be held in escrow by the intermediary to help make interest payments to the lender. In contrast, the principal payments would be made only upon the achievement of outcomes. The credit risk in this structure would be determined by the implementation agency's ability to achieve the results, which would release the payments from the outcome funder. Therefore, these funding structures would only work for well-tested programs ready to be scaled up as only these could provide the lending partner enough confidence to originate these assets. This structure can exist without a lending partner where funding is aggregated by an intermediary and disbursed to implementation agencies. However, a commercial lender can bring an immediate pool of capital of larger sizes that would otherwise be harder to mobilize.



3. **Municipal Bonds** are another popular source of funding that has been used by ULB's to access funding from financial markets over the last two decades. These are bonds issued by ULB's like municipal corporations to raise money for public projects and are repaid from returns generated by such projects or tax revenue. In India, the Bengaluru Municipal Corporation issued municipal bonds for the first time in 1997 for financing city roads and drains for a total of INR 125 crores. Several other issuances followed; the Ahmedabad Municipal Corporation, in 1998, was the first to make a public offering. Other local bodies in Nashik, Nagpur, Ludhiana, Lucknow, Madurai etc., have also accessed the capital markets through municipal bonds. So far, eight local bodies in India have raised INR 3,390 crores via municipal bonds²¹. In 2017, the Pune Municipal Corporation (PMC) raised INR 200 crores for the Smart City project.

²¹ <https://economictimes.indiatimes.com/markets/bonds/heres-govt-plans-to-push-up-municipal-bonds/articleshow/72013527.cms?from=mdr>

4. **Listing on Stock Exchange:** Another latest trend has been the change of water being treated yet another community on Wall Street, highlighting worries that the life-sustaining natural resource may become scarce across more of the world. Recently, California put a price on the water by introducing futures contracts, a first of their kind in the U.S. as wildfires ravaged the West Coast and as California emerged from an eight-year drought. The futures contract is tied to the Nasdaq Veles California Water Index, which measures the volume-weighted average water price. The index sets a weekly benchmark spot price of water rights in California, underpinned by the volume-weighted average of the transaction prices in the state's five largest and most actively traded markets. According to experts, the futures will help water users manage risk and better align supply and demand.
5. **Small scale private operators** are becoming increasingly popular, especially in developing countries. These are often donor-sponsored water and are predominant in rural and semi-urban/ peri-urban areas. They have a high success rate and can be easily scaled up. Several new local operators have emerged in this space.
6. Several developing nations are also witnessing the emergence of large national private water operators. These players are key in supplementing the Government's efforts towards universal water supply and often are responsible for large distribution projects.

Overall, PPPs' trend is to have clear contracts with increased accountability and transparency from both parties. Private players are being accepted more as there is recognition for a customized approach to water supply, and PPPs are being designed accordingly. PPPs vary by country, with different schemes being floated by different Governments. In India, municipal authorities can also use this opportunity to enter PPS as per their cities or regions' needs. The PP structures can vary and be hybrid as there is a move away from traditional classification lease/concession/BOT towards finding localized and sustainable solutions.

Way Forward

The burden of delivering water to all households or expanding access to potable water is not borne by the Government alone. Private operators' role is becoming more and more essential in achieving this goal. It is beneficial for the Government, the citizens, and the private players if specific steps are taken towards facilitating a more enabling environment for PPPs to thrive. This can be bolstered by a clearly articulated stand from the national Government or even state Governments to allow stakeholders and utilities to strengthen their position to PPPs in the water sector. Several municipalities are not in great financial health, which leads to investment gaps. Support from the central or state authorities in supporting PPs can also be critical to their success. Realistic pricing, guidance on tariff structures, and subsidies can also help improve the sector viability.

Adopting standard benchmarking and following well established and accepted principles is likely to increase the chance of PPPs' success and drive private sector participation. There should also be efforts towards reducing unrealistic performance expectations from private operators. To this end, a practical framework should be developed to have phase-wise capital investments and achieve service targets over a period. Although there is a push for customized solutions, there are several common challenges in water PPPs. Addressing this in a standardized way can provide much-needed uniformity across water PPPs. These could include connection policies, tariff collection procedures, disconnection policies, payment security mechanisms, and risk-sharing principles.

Along with private sector involvement, ULBs' capabilities also need to be built up robust implementation, and monitoring capacities are crucial to PPPs' success. Several measures can be taken to bolster cities' ability to engage in PPPs. These can include financial assistance or funding from national or state authorities to help with project preparation resources. Steps for better knowledge transfer and sharing of best practices can help cities make informed choices in PPPs. This can be done by creating platforms to interact with other cities with successful experiences in implementing water PPP projects. This can also help in replicating successful models, avoiding mistakes made earlier, and collaborating on projects. Further, state-level alliances in conjunction with the nodal authorities can clarify and take a stance on public funding, tariff policies, etc. In the long term, developing sector regulation can strengthen local bodies' performance and focus on objective tariff settings and targeted subsidies. This can further pave the way for greater transparency and stability in the sector. This would attract more investment into the sector, including private players, improve project design and enhance implementation through PPP structures. This would have to be done in conjunction with rationalized public funding, tariff frameworks, increased role clarity, and stakeholder participation.

Recent trends indicate a growing interest in water PPPs, and more projects are being contracted. Appropriate interventions can help the private sector play a more significant role, especially in investment and service areas. The overarching goal is for all the players: for-profit corporations, small enterprises, NGOs, and the various Government authorities to work in tandem and support each other. There is an incredible amount of work to be done in the sector, and co-operation between the stakeholders is key to the active participation of all and creating better service solutions. Building city, national international level alliances in the private sector & enabling them to work with the Government can also help scale up the momentum while ensuring projects deliver the required outcomes and are sustainable.

Much work needs to be done to revamp and expand its existing infrastructure in the water sector to provide universal access. If undertaken in a well-planned manner, PPPs in the urban water sector is viable and much-needed alternatives for solving some of the sector's chronic problems.

COMPENDIUM OF CASE STUDIES

Case Study: Small Scale Water PPP, Uganda

Following reforms implemented by the Ministry of Water, there was a growth in small scale PPPs in water. In small towns, the Government began by introducing one-year area performance contracts (APCs) that remunerated local managers based on results. Bonuses and penalties (of up to 25 percent of basic salary) were tied to targets. In Busembatia, specifically, the PPP aimed to attract the private sector in the construction, operation, and management of drinking water distribution networks in small towns and rural areas. Trandint Limited, a large local private operator in Uganda, executed the project. Within the first year, dramatic results were seen to improve the quality and level of water services. Four hundred thirty connections were installed, water production increased from 8 to 21 m³/hr, and collection rates went up by 15 % to 85%.²²

Best Practices

- Advisory and stakeholder coordination support through all stages
- Providing different access to finance solutions allows for smaller operators to work
- Working region by region with local operators can help replicate successful models
- Getting early buy-in from the consumers with Government support is key in collecting water tariffs
- Local solutions are better in some cases, rather than involving large private players.

Successful PPP in water: A case study of Armenia

After breaking out from the Soviet Union, Armenia's water and wastewater facilities were over 30 years old and in dire need of repair and upgrading. To address the problem, the Government decided to involve the private sector, as had been successfully executed in western Europe. The Government entered a management contract with a private operator for the Yerevan Water and Sewerage Company (2000–06), followed by a lease contract in Yerevan (2006–16) as well as a management contract in secondary towns and cities under the Armenian Water and Sewerage Company or AWSC (2004–16), and a joint management contract of three regional utilities (2009–16). This first set of PPPs spanned sixteen years, and the private players achieved the goals set out. Water supply hours were substantially increased, infrastructure was expanded and repaired, customer service improved, and work efficiency increased. Despite the increase in tariffs during this period, there was large public support and willingness to pay to use the improved water services, and less than 30% of Yerevan residents wanted to revert to public management.²³ This experience is relevant as several Indian cities also suffer from dilapidated or lack of sufficient infrastructure, limited hours of water supply, and cost recovery issues.

Best Practices:

- Having one dedicated Government agency as a focal point for the private operator is critical
- A phased approach can be adopted to increase risk transfer gradually for the private operator
- PPPs can be implemented with the willingness of the municipal authority, even if the institutional and regulatory reforms are pending
- The private operator can take charge of capital expenditure, while the public sector monitors and finances the works.
- Cost reduction, increased efficiency, and appropriate tariffs can optimize cost recovery and allow private players to benefit financially

²² https://www.ifc.org/wps/wcm/connect/9a0e7b9a-f536-4232-9a6a-c3c60c1e8428/WBG_AfricaWaterPPPs.pdf?MOD=AJPERES&CVID=IKc4hlo

²³ <https://blogs.worldbank.org/ppps/water-ppps-work-case-armenia>

Case Study: Policy recommendation for increasing PPP in water supply in Ghana

In 2018, Safe Water Network Ghana and the other Safe Water Enterprises developed a policy recommendations paper for public-private partnerships (PPPs) to deliver safely managed water to rural areas, small towns, and peri-urban areas. Ghana's National Water Policy recommended leveraging private-sector resources and capabilities for accelerating sustainable, safe water access for all. To attract private-sector capital and participation in community water supply, the four critical priority areas were:

- 1) **Institutional & Regulatory Environment:** that will boost investor confidence, address the current confusion around the role of CWSA and District Assemblies (DAs) as facilitators, implementers, and regulators, and address issues around the ownership of assets and responsibility for the management of community water systems where private-sector capital is deployed.
- 2) **Financing:** to facilitate partnership with the public sector, the Government policy should include funding of upfront capital expenditure (CapEx), provide guarantees for commercial loans, provide results-based or viability gap funding to private operators and provide tax relief for either operations or the import of essential commodities.
- 3) **Pricing:** The need to redefine pricing formulae and ensure its application to all community water systems for which the Government should review the Community Water and Sanitation Agency Regulations, expand the role of Ghana's Public Utilities Regulatory Commission, and ensure the application of appropriate water tariffs on all community water systems
- 4) **Market sizing & contracting:** Identify and market investment opportunities in the community water supply sector, along with the required governance and regulatory framework by repurposing the role of the Ministry of Sanitation and Water Resources, including equity financing and capital recovery in the design and award of management contracts for piped water systems and by placing all existing viable community water systems under management and leasing contracts supervised by the Community Water and Sanitation Agency.²⁴

Case Study: The Sebokeng and Evaton, South Africa

This region suffers from decades of financial and political instability, along with a low -income population. These persisting conditions eventually led to low maintenance levels, poor quality fittings, and high leakage levels, increasing the costs for the municipality and poor service. The Government decided to involve the private sector through a tendering process. A small-scale PPP was entered, with the payment based on the savings achieved, with no financial risk to the municipality. The project was, in effect, a small-scale PPP with a simple risk-reward format with the primary goal of reducing leakage or non-revenue water. The savings achieved exceed the initial optimistic projections of 20%.²⁵

- PPPs can be small scale and need not be megaprojects
- Funding constraints will always be there, and red tape must be removed to prevent delays or project failure. In this case, there was a 5-month delay because of the lack of funding

²⁴ A paper on strengthening community water supply through public-private partnership: Policy recommendations by safe water network Ghana.

²⁵ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/186992/PublicPrivatePartnershipsUrbanWaterSupply.pdf

- Risk-reward contracts need not be 50/50; careful planning and preliminary investigations and the agreement of both parties is required
- Small steps can lead to more considerable benefits and further work: the high savings led to contract renewal. Also, the identification and repair of many water network problems led to better efficiency and increased contract coverage

Case Study: CSR Initiatives

Honeywell Hometown Solutions India Foundation realizes the importance of clean drinking water as fundamental to keeping good health and a major intervention for poverty alleviation and is committed to delivering safe water to communities in alignment with the UN's Sustainable Development Goal 6.1.

Honeywell

With Safe Water Network India, Honeywell India has setup 180 locally- owned and -operated safe drinking water stations in quality affected habitations of Telangana and Maharashtra, to provide safe, affordable, and reliable drinking water to the communities, to improve their health, generate livelihoods and most importantly, reduce the drudgery of carrying water by women while improving the school attendance for children.



ITC Limited is the 7th largest spender on CSR expenditure amounting to INR 307 crores in 2019 in India, that aligns with United Nation's SDG goals.

As a part of their #LetsTalkCSR series, ITC has set up 127 RO (Reverse Osmosis) plants in villages with poor quality water, in three districts of Andhra Pradesh. Over 150,000 rural people have access to potable drinking water through its health and sanitation initiative.

Case Study: The Karnataka Urban Water Supply Improvement Project

A concession agreement was signed in 2005 between a private developer and five Government bodies: three ULBs, Karnataka Urban Water Supply and Drainage Board (KUWSDB), and Karnataka Urban Infrastructure Development and Finance Corporation (KUIDFC). The project was to be developed in three phases for three years and six months. The private player was expected to prepare the investment plan, undertake rehabilitation of the distribution system, and then take over operations and maintenance.

The main goals were: 24*7 continuous water supply to 90% of the demonstration zone; 90% metering coverage and issuance of bills; reduction in water losses to 30 liters/connection/day/meter pressure and 90% of the customer services stations to be operationalized. These goals were successfully achieved.

Best Practices:

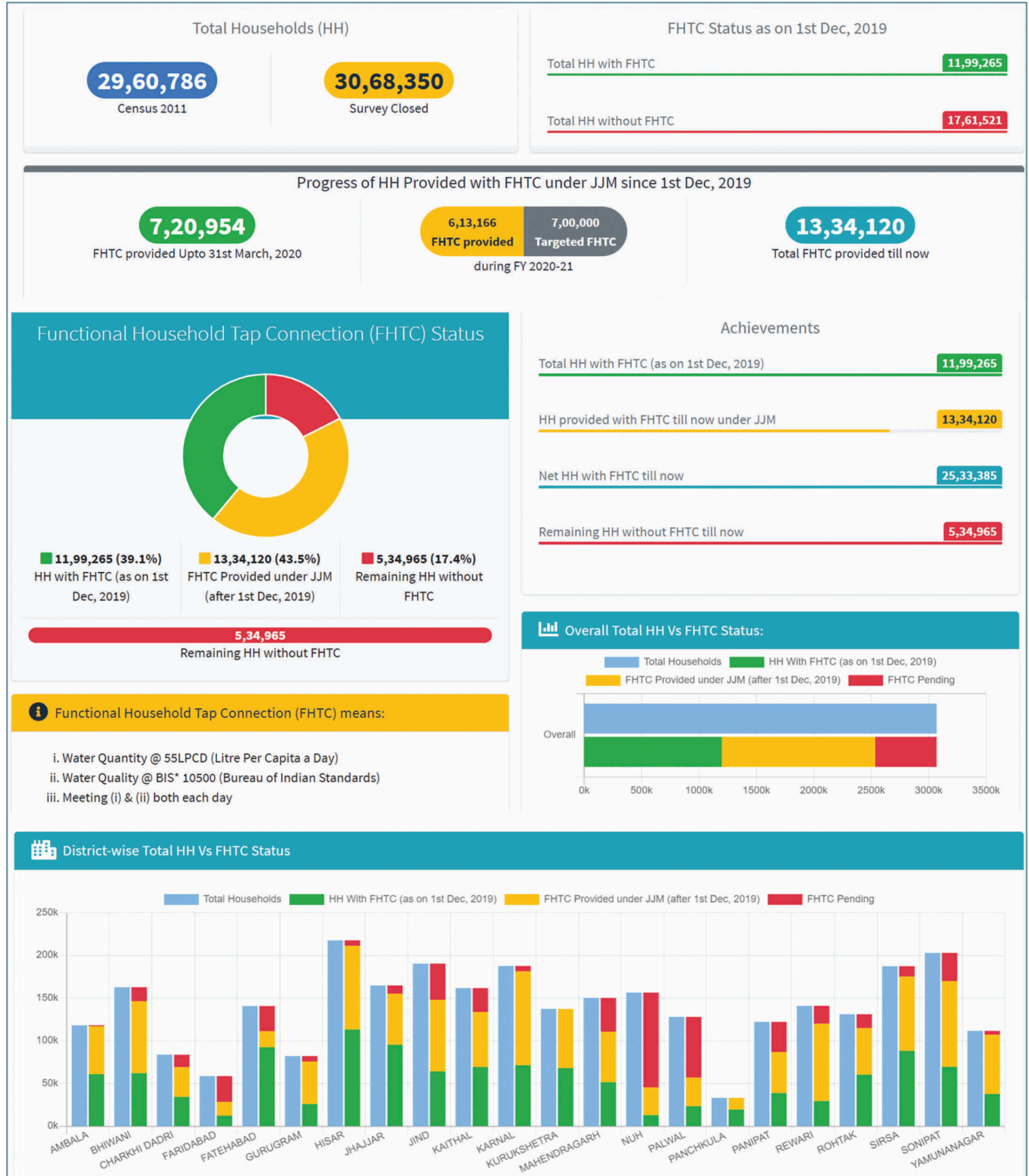
- The implementing agencies should carry out a Pre-project assessment: There were challenges while designing the project due to a lack of information about the distribution network.
- Co-operation by the Government: Sustained co-operation amongst different Government bodies and the private player can prevent delays, especially related to approvals, non-availability of bulk water, uncertainty in the release of payments, etc.
- Stakeholder engagement and awareness: A Social Intermediation and Communications Strategy Cell (SICS) was set up to conduct customer surveys to assess the need for continuous water supply, willingness to pay volumetric tariffs, etc.
- Phased approach: This allowed a performance-based payment to the private operator and reduced the risk burden by expanding slowly. It also allowed for realistic expectations and helped in building consumer and Government trust in the service quality.

Case Study: Haryana Government water supply initiatives

Haryana is one of the foremost States in the country to have taken various initiatives to provide safe drinking water and expects to be among the leading states to accomplish the ambitious target of providing a tap connection to each rural household.

- In 2020, the **Haryana Government launched the 'Jal Jeevan Mission' (JJM) dashboard** for the department officials, Deputy Commissioners, and General Public on its domain. The dashboard depicts performance under Key Performance Indicators (KPIs). It will be instrumental for the state to achieve its target by the year 2022, i.e., much ahead of the National JJM Target of the year 2024. A systematic household survey is being carried out by Public Health Engineering Department, Haryana (PHED), with the help from Saksham Yuva to bring out an accurate, comprehensive, and reliable survey report which would provide a platform for accessing the number of households in which Functional Household Tap Connection is to be provided under JJM. Out of approximately 29.90 lakh rural households, as many as 28.75 Lakh households have been surveyed to date.²⁶
- In 2018, the **Haryana Government launched a Water ATM policy** for urban areas to provide clean drinking water at public places. The municipalities identified public places such as bus-stands, railway stations, parks, bus stops, parking areas, and markets to install water ATMs, 400 meters between two water ATMs. The water ATMs' functioning was ensured in three ways: The municipality would install the water ATMs and ensure that they function correctly. The civic body would install it and hand it over to a private agency for its smooth functioning, and Corporate Social Responsibility would also be available to ensure the functioning of water ATMs. The below dashboard from PHED Haryana is a representative of the break-neck speed at which work is being carried out under JJM:

²⁶ <https://haryanacmooffice.gov.in>



JJM Dashboard - Haryana PHED

Case Study: Pune Municipal Corporation issuance of Municipal bonds for the execution of 24x7 water scheme

In June 2017, Pune Municipal Corporation (PMC) launched India’s largest Municipal Bonds program at Bombay Stock Exchange, Mumbai, and raised INR 200 crores. This issue was a part of INR 2,264 crores borrowing plan of Pune Municipal Corporation. The proceeds raised through the bond’s sale will provide water 24x7 to all the Pune citizens, Maharashtra’s second-biggest city. INR 300 crores will be invested for a reservoir, INR 700 crores for putting meters, and INR 1,800 crores for getting the distribution network in place.

This Municipal Bonds, which was launched, was oversubscribed six times, having received a subscription worth INR 1200 crores. The bonds rated AA+ offering 7.59%, about 30basis points more than any State Government bond. Pune Municipal Corporation achieved this success under the immense guidance and support of the Government of Maharashtra, Ministry of Finance, Ministry of Urban Development, Security Exchange Board of India, SBI Capital Markets Ltd, and advisors from the US Department of Treasury’s Office of Technical Assistance (OTA) in developing this financial asset class.

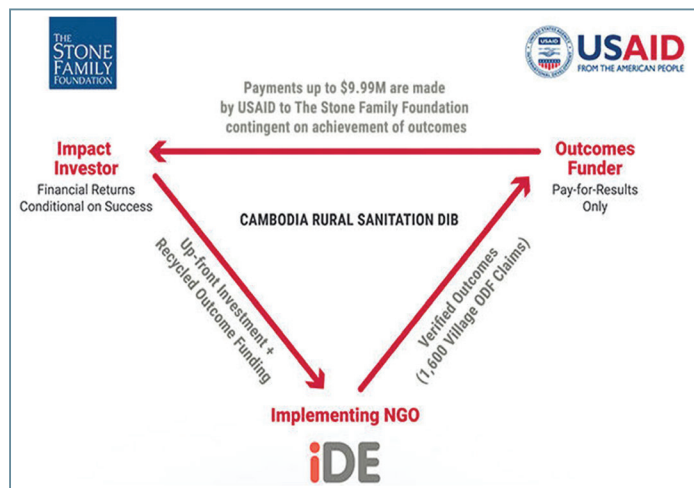
Best Practices:

- Pre-project assessment and preparation of a detailed report addressing the critical problems in the system.
- Co-operation by various agencies, including the Government: working closely with different Government bodies and private players, can prevent delays, mostly related to approvals & regulations, grievances, and compliances.
- Strategy development: A stepwise strategy helps implement various interrelated activities and overcome any challenges faced while performing the range of fundraising activities.

Case Study – Development Impact Bond – Cambodia

World’s first \$10m Development Impact Bond for the WASH sector was launched in Nov 2019 to bring safe sanitation to the most vulnerable household and prevent the spread of disease and contamination of drinking water in Cambodia.

The Cambodia Rural Sanitation DIB aims to accelerate the Cambodian Government’s efforts to reach universal sanitation. The Stone Family Foundation (SFF) will provide the upfront funding – in the form of flexible investment – to allow iDE to implement the four-year program. There will be substantial recycling of the financing by SFF as outcomes payments will be made by USAID to SFF directly on a bi-annual basis, assuming outcome targets are met.²⁷



²⁷ The Cambodia Rural Sanitation long press release final.pdf



Impact investor is Stone Family Foundation (SFF), who have provided financing to the implementing NGOiDE, while USAID (as the outcome funder) will repay the investors on a “pay for results only” basis.

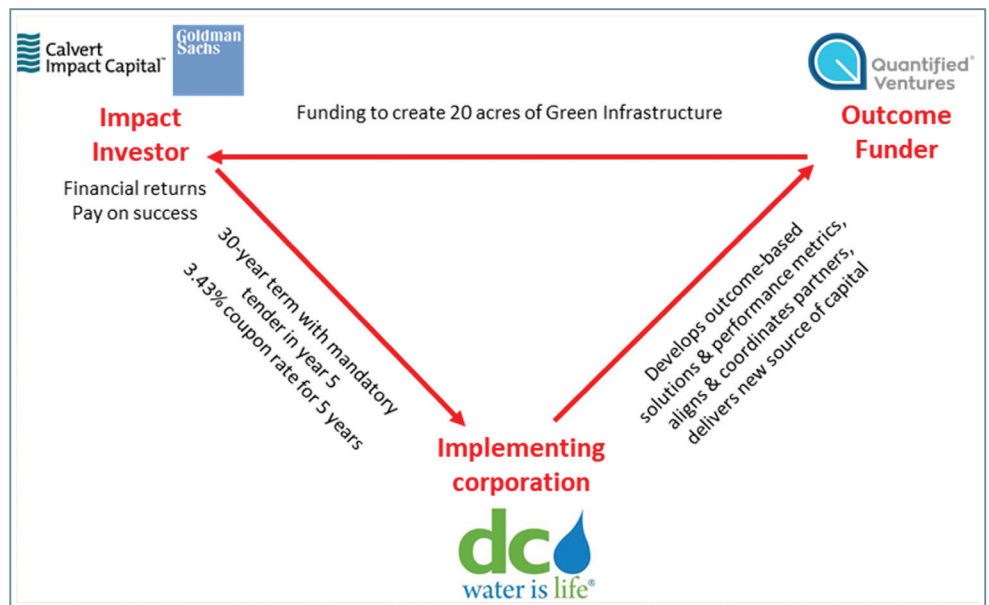
Social Finance (Developed Cambodia Rural DIB) played a key role in designing and brokering the impact bond.

Case Study – Environmental Impact Bond – DC Water

USA's largest \$25M Environmental Impact Bond (EIB) was launched in 2016 to finance the implementation of green infrastructure for Washington's combined sewer overflows problem that was contaminating DC's watershed and disrupting the entire ecosystem.

The EIB aims to accelerate DC water's green infrastructure (GI) project. If DC Water GI performs as planned, with the ability to capture approximately 650,000 gallons of water annually, DC Water will

further build out its GI acreage to include 345 acres. If it over-performs, it means the GI is more efficient and effective than expected, and DC Water can scale accordingly to achieve the desired effect.



MEET THE REVIEWERS



RAVINDRA SEWAK

With over 25 years of experience in the corporate sector followed by a decade in the development sector, Ravi leads Safe Water Network initiatives to provide safe, affordable & sustainable drinking water access to over 1.3 million people in 350 communities. He works for the Safe Water Enterprises' scale-up by developing policy papers and assessments, building alliances and standards. With his rich experience in water and waste-water operations, bulk-water processing, green energy, and point-of-use filtration, Ravi contributes to the Bureau of Indian Standards committees for water and beverages (FAD 14), water treatment systems (FAD 30), and National Water Committees of FICCI and CII. He was a mentor at the Legatum

Center at MIT and Santa Clara University. Ravi is a Post Graduate Diploma in Management from the Indian Institute of Management, Ahmedabad, and a Bachelor of Mechanical Engineering.

ANAND RUDRA



Anand currently is the Senior Advisor for Water, Sanitation & Hygiene (WASH) USAID India. He is a development specialist with over 30 year's hands-on experience. He is a key player in USAID India's efforts on water and urban health portfolio with strengths in interpersonal communication, organizational skills, and leadership. He provides support on consultative, advisory, program management, and monitoring and evaluation functions. He has experience in strategic programmatic support on cross cutting urban development initiatives to South Asia missions. He has worked closely with host mission government institutions, international donors, national and international NGOs, CBOs, and sector professionals and has experience in business alliances including PPP models.

MEET THE AUTHORS



POONAM SEWAK

Poonam brings over 25 years of rich multi-disciplinary experience in policy, strategy consulting, research, entrepreneurship, and institution building. She has founded the organization's flagship sustainable social enterprise model, 'iJal stations. Poonam has co-authored sector reports in Drinking Water Sector and has also provided policy recommendations to the 'National Rural Drinking Water Program' of the Ministry of Drinking Water and Sanitation for 'Har Ghar Jal' vision by 2024. Poonam has conceptualized the Safe Water Enterprise Alliance, a multi-sectoral partnership for sector collaboration and advancement of SWEs. She is currently a Member of the Bureau of Indian Standards

Committee and a Guest Speaker at national and international forums. She holds a Master's degree in Pharmacy from the Nagpur University with a Gold Medal in her graduation.

GARVITA CHAWLA

Garvita is a WASH Specialist – Finance who leads the finance function at Safe Water Network India. Her focus has been on research, modelling, documentation, courseware development, capacity building and institutionalisation of scale models with governments, private donors, bi-lateral organisations clearly spelling out ownership, risks, scalability and financial viability. The models developed by her have been showcased to prestigious organisations like National Bank for Agriculture and Rural Development (NABARD). She has been responsible for driving financial sustainability for the Safe Water Enterprises (SWEs) and for the organization at large. Prior to joining Safe Water Network, Garvita had spent a decade working with banks and financial institutions and has featured on National Television, giving advice on stock markets and addressing investor queries. Garvita is a Chartered Accountant by qualification and holds a Bachelor of Commerce from Delhi University.



POOJA SINGH

Pooja is a WASH specialist who has been engaged in project management, strategic planning, gender analysis, knowledge documents, WASH-related sector reports, research, and communications for more than 13 years. She also represented Safe Water Network at SIWI, Stockholm and informed gender empowerment program initiative by the organization. She has previously worked with FICCI as Assistant Director – ASEAN Division. Pooja is an Environmental Law post-graduate from National Law School of India University, and has a Master's degree in International Business. She has also earned certification in "International Water Law" from the University of Geneva and UNITAR.

IPSITA GAUBA

Ipsita has work experience across various industries, including with the government and international organizations. Her focus has been in strategy projects, social development sector, especially in WASH, skilling and healthcare. She has a strong background in policy and development initiatives and law. She has previously worked at UNDP and KPMG and is an alumnus of Columbia University.



NIDHI MODI



Nidhi supports the Finance team, where she applies her financial and business analytics skills and prepares presentations and reports. She brings more than eight years of experience to her position, having worked with investment banking and consulting firms. For a short stint, she has also worked with a small manufacturing enterprise and applied her skills in retailing and branding of their home grown brand along with managing the entire supply chain team. Nidhi holds a Master's in Business Administration in Finance degree from the Indian Education Society, Mumbai, and a Bachelor of Management from the Mumbai University.

SIMRAN SHARMA

Simran supports the knowledge and research functions at Safe Water Network India, in addition to developing DIY Toolkits and e-modules for WASH training, City/State WASH Profiles, and Concept Notes. She has also been a fundamental part of the City Water Assessment Project. Prior to this, Simran has worked as a Research and Development Officer at Global One, a not-for-profit organisation based in London, where she conducted research for their sustainable water and sanitation programmes in Kenya and Ghana. She has also scripted Episodes for TV1, London, highlighting the importance of Sustainable Development Goals 2030. Simran has a Master's degree in International Studies and Diplomacy from the School of Oriental and African Studies, University of London, and her Bachelor's degree in Political Science from Kirori Mal College, University of Delhi.





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