
WATER AND SANITATION POLICIES IN INDIA: A REVIEW

HIMANSHU KUMAR

Centre for Rural Development and Technology,
IIT Delhi

ABSTRACT

Water is one of the most precious elements present on Earth that sustains all life forms, though found in abundance, but less than three percent of Earth's water is freshwater. It has been a prime national and international concern to conserve water, and treaties, plans, and policies have been devised to manage water resources. Clean water is essential to achieve better health and sanitation facilities; therefore, both form a nexus and should be dealt with accordingly. India has more than 18% of the world's population but has only 4% of the world's renewable water resources, and 2.4% of its land area; this makes it essential to have efficient policies for effective water resource management and sanitation facilities. India introduced its first National Water policy in 1987, which was subsequently taken over by new policies in 2002 and 2012. The Ministry of Drinking water and Sanitation came up with the Model National Water Framework Bill in 2016, which acted as a model for further action. Sanitation has also been prioritised by the central and state governments, along with water resource management. The sanitation programmes in the country which began in the 1950s, failed at the rural front. The focus then went onto developing infrastructure, which later shifted towards addressing behavioural issues. The current phase started in 2014, under Swachh Bharat Mission, and aimed to make India Open Defecation free by 2019. Managing Water and Sanitation facilities for such a vast population is a strenuous task for the government. Setting up institutions, equitable resource sharing, finances and pricing, and sustainable management, are enormous challenges that can be addressed by making stringent laws and inclusive policies. It demands a high degree of political will, participation of institutions, and the community, to address clean water and sanitation for all.

Keywords: Water, Sanitation, Policy, India, Open Defecation, Swachh Bharat Mission

Water And Sanitation Policies In India: A Review

Safe and clean drinking water is essential for public health, drinking, sanitation, irrigation, and ensuring a good quality of life. It is therefore highly vital to sustainably manage this precious resource. However, this is a challenging task as sustainable water management implies the continued stable systems and the aspects of sustainable development, poverty reduction, equitable resource sharing, policymaking, and development plans (UNDESA, 2015). The United Nations General Assembly in 2010 recognized the human right to water and sanitation and acknowledged that clean drinking water and sanitation are essential to the realisation of all human rights but still 844 million people in the world lack even a basic drinking-water service, including 159 million people who are dependent on surface water, 423 million people take water from unprotected wells and springs and 159 million people collect untreated surface water from lakes, ponds, rivers and streams (WHO, 2017).

India has more than 18 % of the world's population but has only 4% of the world's renewable water resources and 2.4% of the world's land area; the country is endowed with several annual and seasonal rivers, the seven major rivers of the country namely Indus, Brahmaputra, Narmada, Tapi, Godavari, Krishna and Mahanadi along with their tributaries make up the river system of India (NIH, 2017). On average, India receives annual precipitation (including snowfall) of about 4000 km³; out of the available 4000 km³ water, 1953 km³ is the average yearly potential flow in rivers available as a water resource. Out of this total available water resource, only 1123 km³ is utilisable, making it a highly precious resource (Kumar et al., 2005). Increasing population and the overutilization of water resources would lead the country to water scarcity by 2025; it has been projected that the per capita average annual availability shall decline from 1816 (m³/year) in 2001 to 1140 (m³/year) in 2050 (UNICEF, FAO& SaciWATERS, 2013). This is a matter of grave concern and makes it essential for the policymakers in India to devise plans and policies that are inclusive and don't compromise on the conservation efforts and people's demands.

India's first National Water Policy was implemented in 1987; a new policy took it over in 2002. National Water Policy (2002) laid the guidelines for the planning, developing, and managing of the water resources and calls for the development of separate state water policies. Yet, the

future of the country's water resources appears bleak, given the excess pressure exerted on the resources by a growing population (Verma et al., 2020).

The Ministry of Water Resources prepared a draft National Water framework bill in 2016 aimed at conservation, protection, and groundwater regulation and includes the "Right to Water" and water use prioritisation principles. Interestingly, it also sets out an institutional framework for planning and regulation based on the Panchayat and Municipal framework provided in Article 243 of the Constitution (Ministry of Drinking Water and Sanitation, 2016).

The Central and State governments have been concerned primarily about clean water and sanitation; the sanitation programmes in the country can be divided into four different phases; the first phase started in the 1950s, where adequate attention was not paid to rural sanitation. From mid-1980s till 1999 was a middle period in which the government focused on infrastructure building and subsidising toilets for poor households; since 1999, a period of more intensive engagement was initiated with increased funding, and a change in approach, shifting from infrastructure building to behavioural change (Ministry of Drinking Water and Sanitation, 2016), the current phase started in 2014 under the name of Swachh Bharat Mission. It aimed to make India ODF free by 2019. The country has progressed from sanitation coverage of 1 percent in 1981 to 31percent in 2011 (Census, 2011) to over 98% in 2019 (Ministry of Jal Shakti, 2019).

Various programmes were initiated to eradicate the menace of open defecation and to improvise the health and sanitation facilities in the nation; from the Total Sanitation Campaign (TSC) in 1999 to Nirmal Bharat Abhiyan (NBA) in 2012 and the latest one, i.e., Swachh Bharat Mission launched by the government of India on 2nd October 2014.

The SBM is an ambitious programme (Bharat et al., 2018) aimed at enhancing the sanitation facilities in the country and ensuring toilets facilities in every household by 2019; another programme called AMRUT (Atal Mission for Rejuvenation and Urban Transformation) came into existence in 2015 which focused on the urban renewal projects and to establish the infrastructure that would ensure adequate robust sewage networks and water supply for urban transformation.

Sanitation facilities have been prioritised, especially in the country's rural areas, with only 22% of rural families having access to toilets in 2001, and with the Total Sanitation Campaign (TSC), a marginal increase of 10.2 percent took place by 2011.

After implementing the Swachh Bharat Mission, there has been an exponential increase in the usage of toilets in rural areas, which has risen to 95% by 2019 (Ministry of Drinking Water and Sanitation, 2019).

Institutional Mechanism for Water and Sanitation

Water supply and sanitation are the responsibility of the State under the Constitution of India. With the 73rd and 74th Amendments of the Constitution (1992), the States may give the responsibility and powers to the Panchayati Raj Institutions (PRIs) and Urban Local Bodies (ULBs) (Cullet and Bhullar, 2015).

The States plan, design, and execute various water supply schemes and operate them through their State Public Health Engineering Departments (PHED)/Water Supply & Sanitation Boards (WSSBs)/Nigams for the implementation of water supply programmes, some states even have Panchayati Raj Engineering Departments or Rural Development Engineering Departments and Water Boards.

The Centre is responsible for guiding the investments in the sector, establishing other organisations and institutions, and lending to the States. The Ministry of Drinking Water and Sanitation, Government of India (GoI), formulates policy guidelines for the Rural Water Supply & Sanitation Sector. It provides technical assistance to the States & Rural Local Bodies such as Gram Panchayats and Village Water and Sanitation Committees (GPs and VWSC) while The Ministry of Urban Development (MoUD) handles water and sanitation matters in the urban areas, (GoI).

The Ministry formulates the policies and strategies on Water Supply, Sanitation and Municipal Solid Waste Management in the Country and provides technical and financial assistance to the States.

The Central Public Health and Environmental Engineering Organisation (CPHEEO) is the Technical Wing of the MoUD, GoI, which deals with the matters related to Urban Water Supply and Sanitation, including Solid Waste Management in the Country.

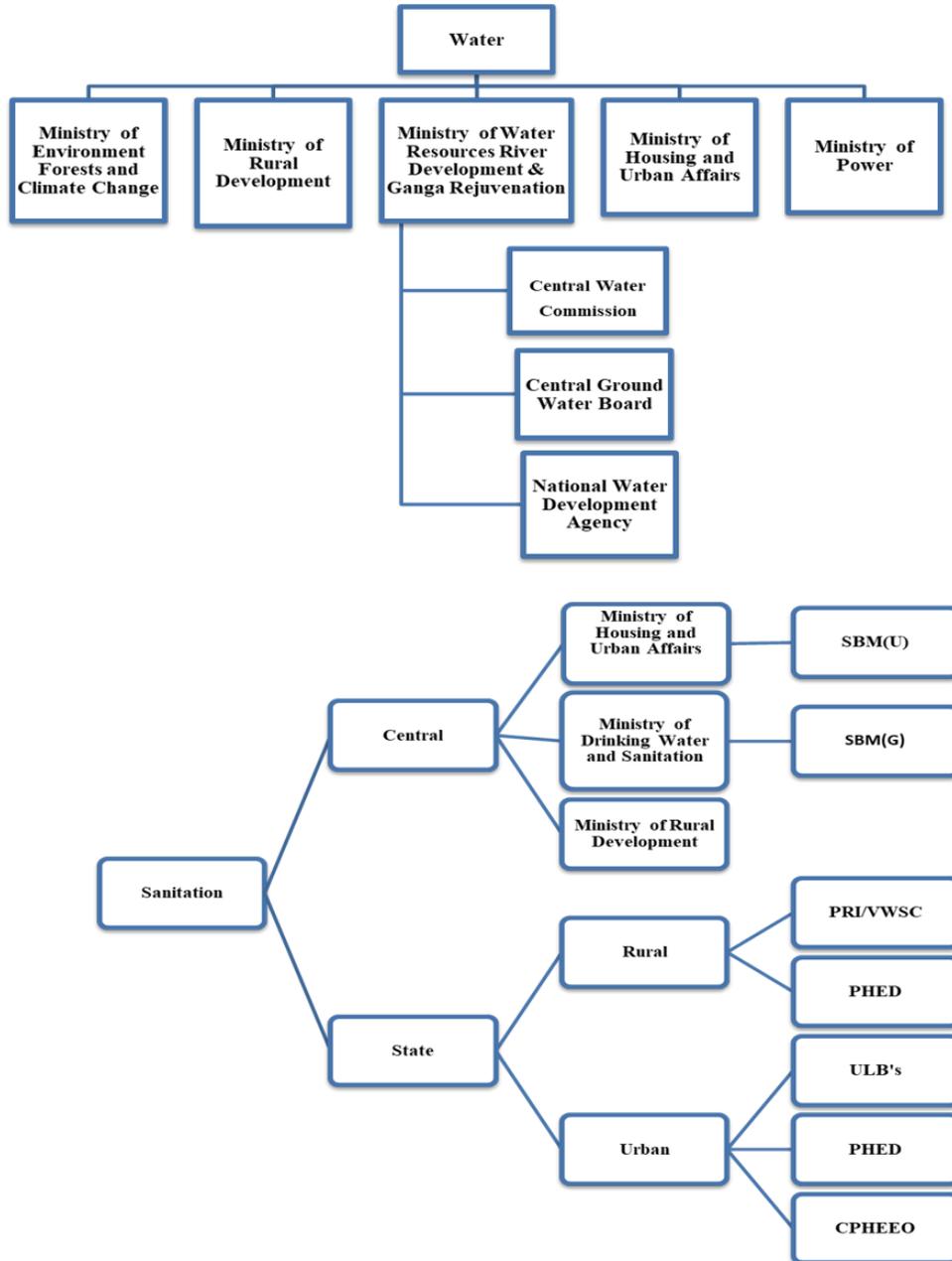
Various government institutions at the Centre have an essential role in managing drinking water supply as the government is bound to its responsibilities to provide clean water, water resources coordination, and financing of infrastructure development.

The Centre plays a vital role in the water supply and sanitation facilities, directly or indirectly, by providing the funds, establishing the policies and framework, and setting the norms. The Government of India has funded several centrally sponsored schemes and projects, the Swachh Bharat Mission (2014) being the new example.

The MoUD in 2009 formulated the National Urban Sanitation Policy, issued an advisory note on Urban Water and Sanitation System (UWSS) and seepage management, and established both bi-annual National Ratings Systems and Service Level Benchmarks for the urban areas at 135 Litres Per Capita Per Day (LPCD) for water, 100 percent coverage of toilets and 100 percent of household coverage of solid waste management. The system of SLB's has been successful in the urban areas, but the rural areas of the country still lack a comprehensive SLB system (GoI, 2009). Figure 1 clearly describes the institutional mechanism for water and Sanitation in the country, whereas the Ministry of Water resources has been created by merging two ministries; the Ministry of Water Resources, River Development & Ganga Rejuvenation, and the Ministry of Drinking Water and Sanitation.

Figure 1

Institutional Mechanism for Water and Sanitation in India



Since water and sanitation are state subjects, there are different institutional arrangements across other states and often across cities within the same condition. The state government provides funding for independent projects and provides supplementary funding for projects sponsored by the Government of India. The state governments also play an essential role in planning and implementing projects for water and sanitation, either by the Public Health Engineering Departments or through specially constituted State Boards (Cullet and Bhullar, 2015).

The powers of the Urban Local bodies are limited, and quite often, there exists a separate arrangement for metropolitan cities and another set for the rest of the cities. In some urban cities, the planning and implementation are sometimes done at the city level, e.g., Delhi Jal Board, Bangalore Water Supply and Sewerage Board, and in the remaining cases by ULBs. In most non-metros, responsibility is split between the state and Urban Local Bodies (ULBs). However, the responsibilities for Operations and Maintenance for a large majority of cases lie with the ULBs.

Table 1

Institutional Systems for Water and Sanitation in India

Institution		Function
Rural	Urban	
Rural Water Supply and Sanitation Department/ Public Health and Engineering Department	Public Health and Engineering Department/ Central Public Health and Environmental Engineering Organisation (CPHEEO)/ Water Supply & Sanitation Boards (WSSBs) / Nigam	Commissioning Water supply and Sanitation schemes at the state level. Responsible for planning, designing, and executing the water supply schemes.

Village Water and Sanitation Committee/Gram Panchayat/PHED	PHED	Collection of taxes
Vigilance and Monitoring Committee/Village Water and Sanitation Committee/Gram Panchayat	Vigilance and Monitoring Committee/Urban Local Bodies/Municipal Corporations	Operation and Management of water supply and Sanitation.

Water Policies and Programmes in India

The national water policy of the country was first formulated in 1987 as water was considered a state subject, and the lack of a national policy was a significant hindrance for effective management of the country's water resources (Dellapenna and Gupta, 2009).

The policy was soon reformulated in 2002 with the focus on the development of a data bank, estimating the available water levels in the country, prioritising water (access to drinking water), developing groundwater rules, meeting drinking water needs, developing irrigation facilities, encouraging the participation of stakeholders in water management, monitoring water quality, promoting conservation consciousness, creating a flood control and management system (Dellapenna and Gupta, 2009; Thatte, 2017).

The 2002 policy paid particular attention to the issues of promotion of rehabilitation schemes for the displaced, enhancing participation by private parties in water management, developing an effective monitoring system, and ensuring that states share the waters of a joint river. The national policy was supplemented by state water policies (Thatte, 2017).

The Ministry of water resources introduced the revised draft National Water Policy (2012), inducing few changes in the existing National Water Policy (2002), the significant changes included; consideration of an integrated perspective considering local, regional, state and national context with respect to the water resources planning, integrated water resource management, the need for a comprehensive legislation for optimum development of interstate rivers and river valleys, safe drinking water as the first priority of the policy followed by

domestic usage, defining minimum service delivery standards providing minimum quantity of potable water for essential health and hygiene to all the citizens, available within easy reach of the household, the policy also focused on more effective water resource management and planning, taking into consideration the natural disasters such as flooding and states that priority be given to the community management of the water resources (Bedi and Tripathi, 2017).

The water policies also proposed the introduction of water rights; with the 73rd amendment of the Constitution, water has been specified as a matter of the subject of state, and the state water policies restate that the state is the “sole owner of the water resources” even while they promote water rights of the users (Cullet and Bhullar, 2015). The policies also introduced wide-ranging legal and institutional reforms, of which three are significant: (a) the introduction of a legal framework for the formation of water user associations for effective decentralisation of water governance, (b) introducing laws for the provision of establishing a water resources authority whose primary characteristic is to be largely independent of existing irrigation and other water resource departments, and (c) the regulation of groundwater.

The Draft National Water Framework Bill, 2016 mandates the right to sufficient quantity of safe water for life within easy reach of the household, assigning the responsibility to the state for the provision of water services even if it has to set the duties to private agencies and institutions (GoI, 2016). Many states in the country have recently formulated dedicated water policies and have implemented reforms in water management. Although there have been institutions or financial reforms that focus on privatisation, tariff regularisation, and revision, the Centre and state are struggling to implement the policies at the grassroots level.

Still, a rational scientific framework is missing to ensure socio-economic sustainability (Bedi and Tripathi, 2017). Particularly considering the urban water sector, several national and state programmes have been launched to increase the access to water supply services supported by the government, Urban WSS program, JnNURM, and establishing Service Level Benchmarks (SLB's). These programmes have been successful in increasing the access of the urban population to essential water services (90 percent) and sanitation facilities to (60 percent) households but still have to work towards the achievement of a bigger target of providing 100 percent water access and sanitation facilities in the urban areas (Bharat & Sarkar, 2016). Table

2 highlights the trajectory of Water governance in India post- independence, the governments have prioritised water and have shown intent towards developing inclusive and robust strategies and plans but we are yet to achieve the desirable results.

Table 2

History of water governance post-independence in India

YEAR	EVENT
1949	The Environment Hygiene Committee (1949) (Bhor Committee) recommended providing a safe water supply to cover 90 percent of India's population in 40 years.
1950	The Constitution of India specifies water as a state subject.
1969	The National Rural Drinking Water Supply program was launched with technical support from UNICEF, and Rs.254.90 crore was spent during this phase with 1.2 million bore wells dug, and 17,000 piped water supply schemes provided.
1972-73	Introduction of the Accelerated Rural Water Supply Programme (ARWSP) by the Government of India to assist States and Union Territories to accelerate the pace of coverage of drinking water supply.
1981	As a party to the International Drinking Water Supply and Sanitation Decade (1981-1990) declaration, India sets up a national-level Apex Committee to define policies to provide safe water to all villages.
1986	The National Drinking Water Mission (NDWM) was launched to accelerate the process of coverage of the country with drinking water.
1987	First National Water Policy drafted by the Ministry of Water Resources giving priority to the drinking water supply.
1991	The National Drinking Water Mission (NDWM) was renamed Rajiv Gandhi National Drinking Water Mission (RGNDWM).
1994	The 73rd Constitution Amendment makes provision for assigning the responsibility of providing drinking water to the Panchayati Raj Institutions.
1999	Formation of separate Department of Drinking Water Supply in the Ministry of Rural Development, Govt. of India. To ensure the sustainability of the systems,

	<p>steps are initiated to institutionalise community participation in implementing rural drinking water supply schemes through sector reform. Sector Reform ushers in a paradigm shift from the 'Government-oriented supply-driven approach' to the 'People-oriented demand-driven approach. The role of the government reoriented from that of the service provider to the facilitator. Total Sanitation Campaign (TSC) as a part of reform principles initiated in 1999 to ensure sanitation facilities in rural areas with the specific goal of eradicating the practice of open defecation. TSC gives strong emphasis on Information, Education and Communication, Capacity Building, and Hygiene Education for effective behavioural change with the involvement of (Panchayati Raj Institutions) PRIs, (Community Based Organisations) CBOs, and NGOs</p>
2002	<p>It was a scaling up of sector reform initiated in the form of the Swajaldhara Programme. The National Water Policy was revised; priority was given to serving villages that did not have adequate safe water sources and to improve the level of service for villages classified as only partially covered. India commits to the Millennium Development Goals to halve people without sustainable access to safe drinking water and basic sanitation by 2015, from 1990 levels.</p>
2005	<p>The Government of India launched the Bharat Nirman Programme, emphasising drinking water within five years to 55,069 uncovered habitations, habitations affected by poor water quality, and slipped back habitations based on a 2003 survey. Revised sub-Mission launched as component of (ARWSP) for focused funding of quality affected residences.</p>
2007	<p>The pattern of funding under Swajaldhara changed: 50:50 Centre-State shares.</p>
2009	<p>National Rural Drinking Water Programme launched from 1/4/2009 by modifying the earlier Accelerated Rural Water Supply Programme and subsuming earlier sub-Missions, Miscellaneous Schemes, and mainstreaming Swajaldhara principles</p>
2010	<p>Department of Drinking Water Supply renamed as Department of Drinking Water and Sanitation</p>

2011	Department of Drinking Water and Sanitation upgraded as separate Ministry of Drinking Water and Sanitation
2012	Twelfth five-year plan focusing on piped water supply with 55 litres per capita per day earmarking of 5% funds for coverage of quality affected.
2013	Launching a unique programme to address the rural water supply and sanitation issues of four low-income States with the collaboration of the World Bank.
2014	Innovation of new technology in rural drinking water
2019	The Ministry of Jal Shakti was formed in May 2019. This was created by merging two ministries; the Ministry of Water Resources, River Development & Ganga Rejuvenation, and the Ministry of Drinking Water and Sanitation.

Note: Adapted from Annual Report 2014-15, Ministry of Drinking water and Sanitation

Sanitation Programmes in India

Lack of adequate sanitation has been a significant problem in India. It has been long struggling with Open defecation, which is a traditional behaviour in the country and can be attributed to various factors such as lack of awareness of the people and lack of infrastructure, the poor section of the society suffers the substantial loss of their lives, health, and scarce financial resources because of inadequate sanitation facilities (WSP, 2010). The traditional version of sanitation focussed mainly on the disposal of human excreta by cesspools, open ditches, pit latrines, bucket systems (Ahmed et al., 2004).

The first rural sanitation programme in India was introduced in 1954 as a part of the First Five Year Plan of the Government of India. Still, the government got a huge blow when the 1981 Census revealed that rural sanitation coverage was only 1 percent in the country. Therefore, a need for a dedicated programme to develop sanitation facilities in the country was felt. The Central Rural Sanitation Programme (CRSP) was launched in 1986 to improve the quality of life of the rural people and provide privacy and dignity to women; under this, 9.45 million latrines were constructed for rural households (WSP, 2013).

Despite huge infrastructure development and massive investment, only a marginal increase of 1 percent was observed from the CSRP programme. The people were still reluctant to use

toilets, and the CSRP neglected the school sanitation and collaboration with the community and NGOs, leading to its poor performance in the country.

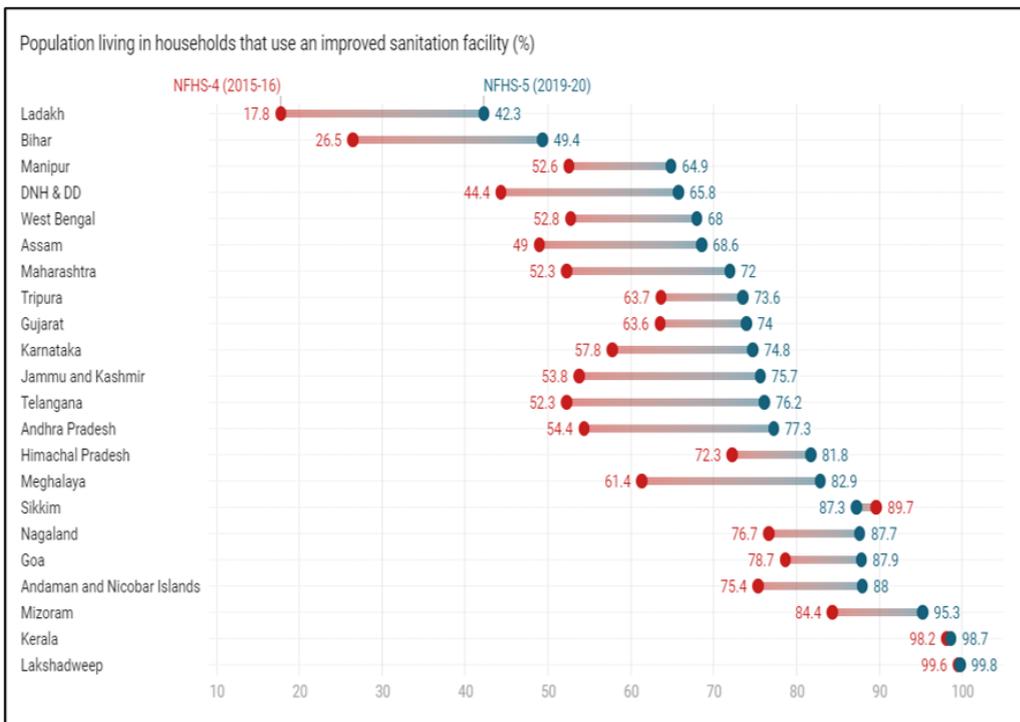
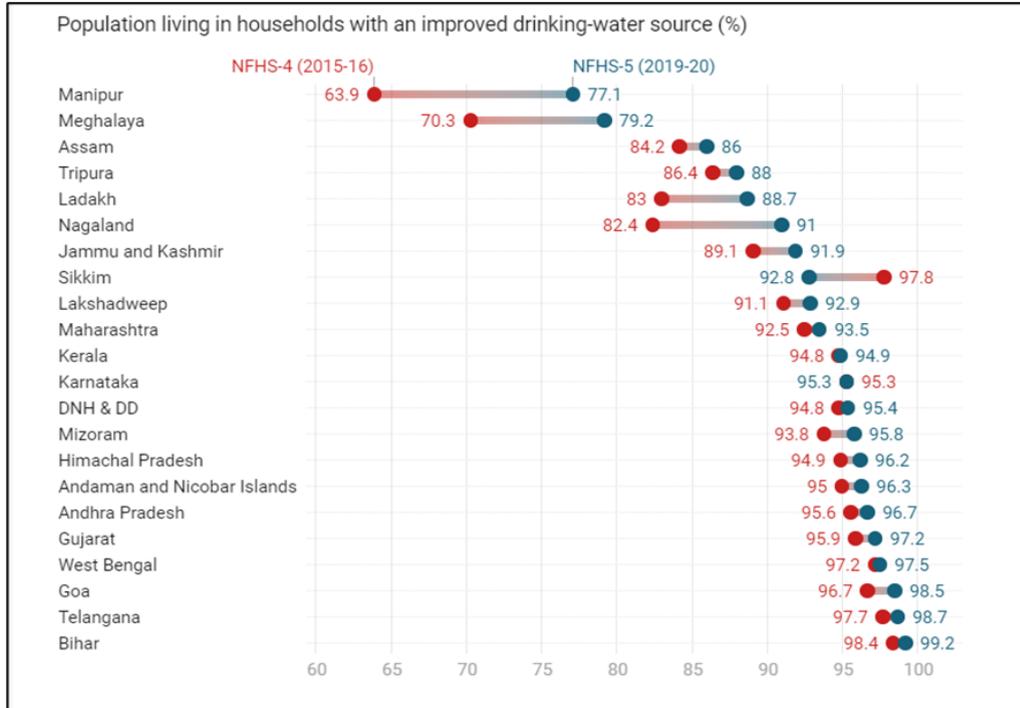
After 13 years of slow rural sanitation progress, the Total Sanitation Campaign was launched in 1999. The Total Sanitation Campaign (TSC) provided a more comprehensive approach, which was driven by the people and intended to cover the loopholes of the earlier sanitation programmes of the country. The central government provided 65 percent of the total outlay for constructing individual household toilets, and the rest, 35 percent, was covered by the states and the beneficiary households. The TSC had huge budgetary allocations from (\$34 million) in 2001-02 to (\$ 300 million) in 2008-09 (WSP, 2013).

To further strengthen the TSC, a concept of Nirmal Gram Puraskar (NGP) was also initiated in 2003, which facilitated the (GPs) for achieving total sanitation. Poor programme implementation led to only a minor increment in the rural sanitation coverage, and actual rural sanitation coverage in India was a mere 32.70 % in 2011 (Hueso and Bell, 2013). Encouraged by the villages' publicity through the NGPs, TSC was renamed and re-established as Nirmal Bharat Abhiyan in 2012. Most of the TSC objectives and strategies remained constant, but the year to achieve the targets was extended from 2017 to 2022. The programme focused on the provision of toilet facilities across all schools of the country.

The issues of release of the fund and other administrative flaws led to this programme's poor results. The Government of India in 2014 launched the Swachh Bharat Abhiyan, taking over the Nirmal Bharat Abhiyan. The programme has two components: the Swachh Bharat Mission (Gramin) and the Swachh Bharat Mission (Urban), and it essentially aimed at providing toilets to all households by 2019 and providing basic sanitation facilities to all the citizens of the country, and make India free from Open Defecation (Singh et al., 2018).

Figure 2

Progress in access to improved sanitation facility by states and UTs of India, 2015-16 to 2019-20



Adapted from: Down to Earth, December 2020

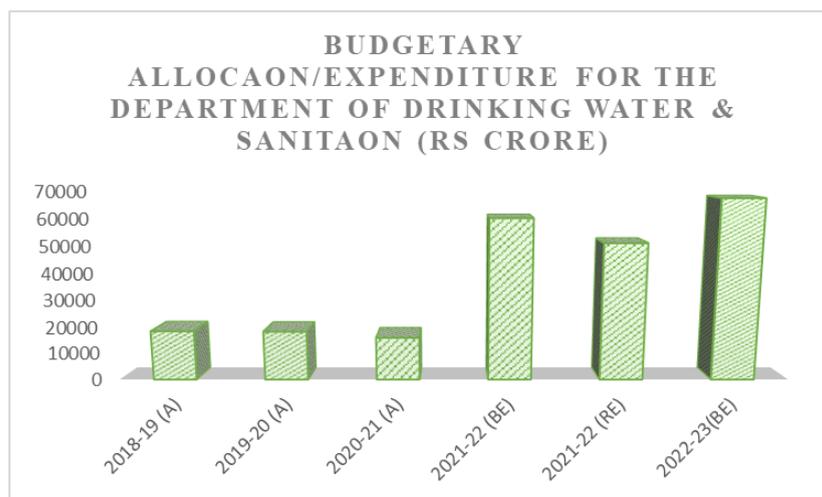
Present Challenges and the Way Forward

1. Finances and Pricing

Water, sanitation and hygiene forms a nexus which act as determinants of health and nutrition and have been considerably prioritised by the state and central governments, substantial amounts of money has been allocated for the purpose and significant progress has been made to provide clean water to the people of India. If we analyse the current scenario, the budget has given high priority to the drinking water and in the Budget Estimate (BE) for 2022-23, the Department of Drinking Water and Sanitation, under the Ministry of Jal Shakti, has been given a 12 per cent increase over the 2021-22(BE).

Figure 3

The Budgetary allocation/ expenditure for the department of Drinking water and Sanitation (in Rs. Crore)



Note: Adapted from Centre for Budget and Governance Accountability (CBGA), 2022

According to the National Sample Survey Office's (NSSO) 76th round, one in every five or 21.4 percent of Indian homes has piped drinking water connections. The situation is even worse in rural India, where only 11.3 percent of households have access to drinkable water. In urban India, 40.9 percent of households have access to piped water. The latest data show the monumental task that the Centre faces in implementing the Nal se Jal scheme, which aims to provide piped water to every family by 2024. Hand pumps, tube wells, public taps, piped water

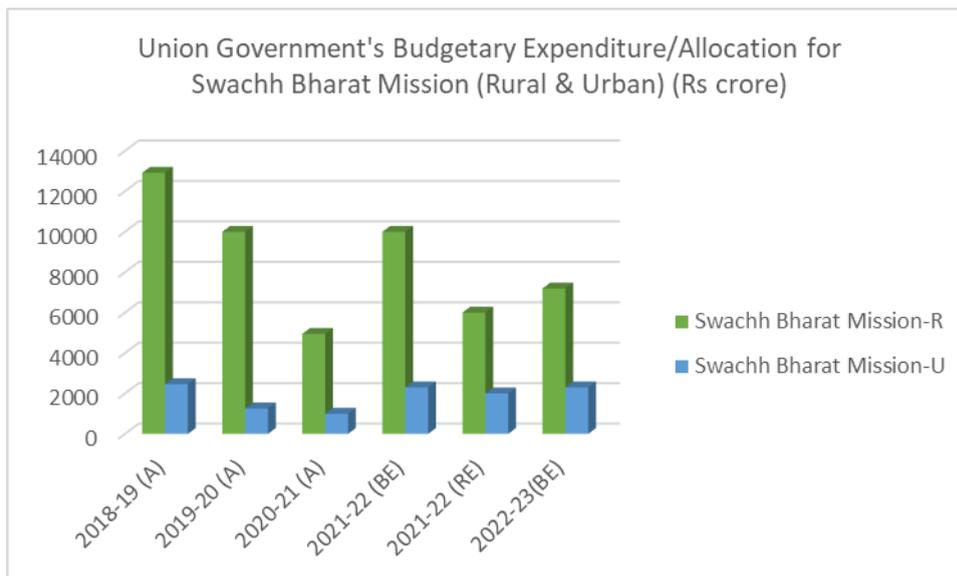
from a neighbour, protected or unprotected wells, and private or public taps are still used by around 58.3% of houses. Hand pumps were the most commonly used primary source of drinking water in rural regions, accounting for 42.9 percent of total usage. According to the Drinking Water, Sanitation, Hygiene, and Housing Condition Survey, hand pumps are the predominant source of drinking water in rural regions (42.9%), but piped water is the primary source in urban India (Down to Earth, 2019).

The Jal Jeevan Mission (JJM), a flagship programme of the central government to ensure tap water connection by 2024 in all rural households by 2024 has seen substantial budget allocation since its inception in 2019 (from 5484 crores in 2018-19 to 60,000 crores in 2022-23 [BE]) as observed in *Figure 3*. The programme encompasses the water recharge, grey water management, water conservation and rainwater harvesting measures. The government aims to implement it through public participation and a community-based approach is adopted which encompasses education, communication and awareness generation.

Even after implementing massive health, water, and sanitation programmes in the past 60 years, the situation has not improved much; this could be due to poor financed institutions and a wide gap between demand and supply (Chaplin, 2011). Thus, it becomes crucial to have adequate funding and financial assistance to tackle the menace of open defecation. The Swachh Bharat Mission aimed to build 12 lakh individual household toilets with an investment of (\$30 billion). The government cannot provide this amount; external agencies and taxation would be required for the purpose. The SBM (G) states that financial assistance of Rs. 12500 would be provided per unit per household for the construction of a latrine, for which the government would have to shell out a large sum of money, and massive funds would be required to meet this objective (GoI, 2013).

Figure 4

Union Government's Budgetary Expenditure/Allocation for Swachh Bharat Mission (Urban and Rural) (in Rs Crore)



Note: Adapted from Centre for Budget and Governance Accountability (CBGA), 2022

In 2021-22, the Swachh Bharat Mission- Phase II completed the construction of 7.16 million individual family latrines and 19,061 Community Sanitary Complexes. Rural homes with improved sanitation facilities increased from 48.5 percent in 2015-16 to 70 percent in 2019-21, according to data released by National Family Health Survey-5 (GoI, 2022). At least 13 states have utilised less than half of the allocated funds and a major portion lied unspent with the states in the financial year 2018-19 and 2019-20.

For the SBM to successfully thrive in India, the next phase needs higher budgetary allocations and should also include the issue of hand hygiene. *Figure 4* explains the budgetary allocations for SBM (U) and SBM(R). The rural areas have been prioritised as the budget reflects a higher allocation of funds but a slight decline in fund allocation is noticeable. The COVID pandemic has also played a crucial role in downplaying the efforts of various programs and policies and has highlighted the significance of hygiene, especially, hand hygiene. A report by WSP, 2014 has estimated a capital requirement of INR 5,193 billion and an operating expenditure

requirement of INR 2,647 billion from 2012-32 for urban sanitation in India, let aside the amount required for the rural parts of the country. The state governments are already short of funds and rely heavily on the central government for funding and necessary resources. Although the Public Private Partnership (PPP) model is good, it has some issues which may be due to incapable legislation, financial and legal structuring of the models, and sometimes economic viability of the projects, so before the government goes in for a PPP mode of implementation, it needs to address all the constraints that may hamper the viability of the project (Devkar et al., 2009).

2. Awareness Building

Education, knowledge and capacity building are some of the critical aspects that have to be taken care of; infrastructure alone does not ensure the success of the programme, the citizens must also have the proper access, information, and knowledge is made available to the beneficiaries regarding the toilets, their health benefits and the need for adequate sanitation facilities (Cullet and Bhullar, 2015). Awareness generation and motivating people to quit open defecation would be a significant challenge for the governments. Behavioural changes have proven to be successful in reducing the number of openly defecating populations in the villages of north India and rural landscapes in general are now becoming more aware and there is a significant increase in the number of toilet users (Behera et al., 2021). Capacity-building activities must be conducted at the community level, including non-governmental organisations (NGOs) working for water and sanitation programmes. Wells et al. (2013) have highlighted that knowledge management can translate into good policies, this could be achieved by building on the good practices, experiments and sharing knowledge and creating knowledge and information banks, creating regional institutions which promote knowledge and capacity building and not relying merely on the government framework and NGOs, the authors have also defined the strategic pillars of knowledge management which are: Identifying the gaps, areas for innovation and research, training and capacity building, knowledge sharing and to learn from the most successful and most failed case studies. Devising local area knowledge centres and repositories form the key to build awareness among the masses in India. The COVID pandemic could be considered as an excellent example in this case wherein, a country which was totally unaware about masks was all masked up, practised hand hygiene like never before and used sanitisers.

3. Institution Building

Since long there was a need for dedicated institutions for achieving better results in the health and sanitation sector of the country; in most of the states, the Municipal corporations take care of the water and sanitation of the states, assigning the responsibilities of the O&M to the PHED department in the Urban areas and the GP in the rural areas. Still, it has been observed that the PHED department is overburdened, and their work efficiency is impaired by overstaffing, under-pricing, and high levels of unaccounted water, which further hamper their O&M (Das, 2014).

In the case of urban areas, the water supply and sanitation system in the country is suffering from inadequate levels of service, increasing demand-supply gap, poor sanitary conditions, and poor financial conditions leading to poor performance, and the states find it difficult to sustainably manage their water resources (Briscoe and Malik, 2006).

On the other hand, the rural areas do not have dedicated institutions for water management and are dependent mainly on the community efforts and local level management of the resources. However, the 73rd and 74th amendments of the Constitution have decentralised water and sanitation management powers. Still, there is a need to build institutions, particularly at the village, Panchayat levels. Efficient water demand management is hindered by inadequate institutional reforms and the poor implementation of existing schemes and policies that hurt water service provision (Cronin et al., 2014). We can learn from the efficient water management and sharing practices from the Paani Panchayats from Maharashtra, the model villages of Ralegan Siddhi and Hiware Bazar could be explored and a similar framework could be developed to address the needs of rural areas in particular. Therefore, we need to devise a standardised system to ensure safe drinking water for the citizens.

4. Policymaking

Despite various programmes and interventions by the central and the state governments, there have always been specific gaps in the policy preparation or the implementation (Hueso and Bell, 2013). Notably, governments' approach for the performance of these programmes has been a "top-down" approach. It is important to note that the success rate of any programme depends on the primary stakeholder consultation and the involvement of the community

personnel. The governments have now realised that for effective implementation of the plan at the national level, it is essential that the "bottom-up approach" is adopted. Still, good governance of the policies and programmes remains a significant issue, particularly in the rural parts of the country, which have less access to information and knowledge about the various approaches, schemes, and interventions; the policies should be made at a large scale. Still, the implementation should narrow down to the local level (Butterworth et al., 2010).

Infrastructure development is also a key policy challenge because of its economic characteristics and needs to be carefully incorporated into the policy for sustainable investment (Pandey, 2017)

Some of the significant issues faced by the programme implementation authorities are the lack of technical and standardised data, lack of knowledge to deal with Public Private Partnership (PPP) models efficiently, communication gap with the citizens, and financial instability. The policies must include all the instruments, such as sustainability indicators, that can help in providing better policy planning and implementation (Hezri, 2004).

For the sustainable functioning of the systems, a monitoring and evaluation plan must be implemented to test the effectiveness of the policy. There is no existing state-level framework for sanitation legislation to cover all the fundamental sanitation issues within the state. Eventually, sanitation issues in the rural and urban areas have been addressed separately (Cullet and Bhullar, 2015). The policies have to be inclusive of urban and rural areas, the metropolitan regions got SLB's in 2009, but the rural areas are still lagging behind the SLB's.

The possible policy level solutions that could help us evade the water scarcity: (a) preserving or improving the quality of the available resources through pollution abatement and wastewater treatment, (b) allocating resources where it adds the most value, this refers to the various water pricing and cost recovery mechanisms, property rights, quasi water markets, taxing pollutants "Polluter pays Principle," and payments for aquatic ecosystem services, (c) managing demand so as to enhance conservation practices and lower per capita consumption, and (d) developing of markets for reused water (OECD, 2009).

5. Equitable Distribution

Equity and inclusion are highly challenging issues in sanitation and hygiene sectors; inequitable coverage and services remain a daunting task for the authorities (WSP, 2013). The Ministry of Drinking Water and Sanitation, Government of India, also recognizes that equity and inclusion are the keys to ensure complete sanitation in the country (Mishra, 2017). The programme implementing authorities have to make sure that sanitation is made accessible to all, particularly to those who are socially and economically marginalised, women, children, the lower castes, and the old being mainly addressed, the accelerated Rural Water Supply Programme failed in the country since it overlooked the most critical aspects of caste and gender and was unsuccessful in addressing its primary beneficiaries—women and Scheduled Castes and Scheduled Tribes (Singh, 2008).

Institutions that promote women's participation, therefore, need to be better aligned with traditional social institutions. Solid and Liquid Waste Management (SLWM) is one of the critical issues that need to be addressed. Therefore, there is a need to develop systems for the scientific disposal of waste. Additional costs would be met with the state/GP funds and various other sources (Cullet and Bhullar, 2015). Although dedicated policies and programmes have been introduced, translating them into significant service improvements, especially for the poor, is still a considerable challenge (WSP, 2013).

6. Sustainable Resource Utilisation

Water is not a free resource, rather an economic good; therefore, we need to change our approach towards it, and rather than trying to fulfil increasing water demands, we should stress on improving the efficiency of water use trying to "do more with less" (Kundzewicz, 1997). It would be appropriate to say that water and sanitation directly influence each other, and meeting the needs of the country's ever-growing population would be a daunting task for the governments. Owing to the ever-increasing population growth, the capita annual availability has reduced from 1,816 cubic metres in 2001 to 1,544 cubic metres in 2011 (Suhag, 2016). Poor resource management has poignant impacts on the health, socio-economic sector, and the environment; therefore, sustainable management of the natural resources is essential to achieve sustainable development (Dungumaro and Madulu, 2003).

7. Efficient Monitoring and Evaluation Systems

According to (WSP 2010), there is a difference between the data of the State and the Central governments on water usage and supply. Although devising a government-wide monitoring and evaluation system for a country like India is not easy because of the complexity in the governance system (WSP, 2010) but to keep the governments accountable and ensure actual implementation of the policies and programmes, we need a better monitoring and evaluation system that can provide us with the real-time data. There are no discrepancies between the State and the Central government and the authorities working with them. One of the primary concerns in the water and sanitation sector is the lack of capacity at all levels and incentives and accountability. Therefore, a responsible and accountable system is needed to achieve total sanitation (IIHS, 2014).

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