International Journal of Environmental Sciences
Vol. 9 No. 2 (July-December, 2023)
Copyright@ Academic Science Publications and Distributions
http://www.theaspd.com/ijes.php

India's Prospects for Attaining Sustainable Development Goals on Health & Sanitation: A Critical Analysis of Swachh Bharat Abhiyan & Jal Jeevan Mission

Manoj K. Sahoo[1]

Public Policy Expert & Visiting Professor, Pandit Deendayal Energy University, Gandhinagar, India.
Email: manoj.sahoopdpu@gmail.com
ORCID: 0000000224765230 , Scopus ID: 58336560800

Sriram Divi[2, 3]

Associate Professor, Department of Public Policy and Administration School of Liberal Studies Pandit Deendayal Energy University, Gandhinagar, Gujarat, India

Honorary Research Associate
Faculty of Management Sciences
Durban University of Technology
Durban, South Africa
ORCID No: 0000-0003-0886-771X, Scopus ID: 57769048600

Brijeshsinh Rathod[4]

Masters scholar in Public Administration, Pandit Deendayal Energy University, Gandhinagar, India.
Email: brijeshsinh119@gmail.com

Hemangi Vekariya[5]

Masters scholar in Public Administration, Pandit Deendayal Energy University, Gandhinagar, India.
Email: patelhemangi429@gmail.com

Corresponding Author: sriram_divi@yahoo.co.in

Received: 24th June 2023
Revised: 30th September 2023
Accepted: 20th November 2023

Abstract: Sustainable development goals are important parameters mandated by United Nations to be achieved by the countries by 2030. Globally it is reported that numerous countries might not be able to achieve most of the SDG targets. India is also no different in real sense in this respect- in particular to the goals related to health and sanitation, i.e. SDG 3: *Good Health & Well-Being*, and SDG 6: *Clean Water and Sanitation*. India has achieved certain milestones related to clean and safe drinking water, but this has not reflected in overall health attainments, particularly in water-borne communicable diseases like diarrhea and resulting deaths. This has been a peculiar

scenario in India despite its stated considerable progress of *Swachh Bharat Abhiyan-* i.e. the mission on clean India, and *Jal Jeevan Mission-* i.e. the mission on provisioning safe drinking water. This suggests presence of pertinent challenges in the impact of *Swachh Bharat Abhiyan* and *Jal Jeevan Mission* as public policies on health and sanitation, in spite of their achievements such as, improvement in sanitation coverage from 38.70 percent in 2014 to 100 percent at present, and increase in household tap water coverage from 16.65 percent in 2019 to 65.61 percent at present. The present paper analyses India's prospects of attaining sustainable development goals (SDGs) on health and sanitation, particularly through public programme intervention of *Swachh Bharat Abhiyan* and *Jal Jeevan Mission.* The research methodology followed is policy critique approach with secondary and quantitative research analysis. The findings indicate several challenges before these two programmes due to which India's SDG targets on health and sanitation achievement might be delayed.

Keywords: Sustainable Development Goals (SDGs); Swachh Bharat Abhiyan; Jal Jeevan Mission,Health & Sanitation; Public Health; Public Policy

Introduction

Sustainable Development Goals (SDGs) are adopted by UN member countries under the "2030 Agenda for Sustainable Development" in order to achieve peace and prosperity. This 17 Goals action-plan calls for a global partnership of all the nations to take innate actions for sustainable future of the people and the planet. It emphasizes on an integrated approach for ending poverty & hunger; improving quality of health, education, water, sanitation; reducing inequalities (both class and gender); while tackling the issue of climate change for a sustainable and habitable planet for our future generations. As most populous nation of the world with over 1.4 billion people (UN,2023), India is destined to play a significant role in shaping the future of this planet. If India achieves its targets of Agenda 2030, it will reflect globally. India underscored its role at *UN Sustainable Development Summit 2015* as, "Sustainable development of one-sixth of humanity will be of great consequence to the world and our beautiful planet. It will be a world of fewer challenges and greater hope". The *NITI Aayog* coordinates India's efforts in achieving its SDGs and Agenda 2030. This paper analyses India's progress in achieving SDG-6: "ensure availability and sustainable management of water and sanitation for all" and further discusses its linkages with SDG-3: "ensure healthy lives and promote well-being for all at all ages". The policies in focus are the "*Swachh Bharat Abhiyan*" and "*Jal Jeevan Mission*". The Indian government's cleaning mission, *Swachh Bharat Abhiyan(SBM)* was started in October 2014, for freeing India from open defecation within five years by Mahatma Gandhi's 150th birth anniversary, to fulfil his dream of a 'Clean India'. It is considered as the largest cleanliness drive in India till date, that achieved the goal of 100% ODF (GoI). *Jal Jeevan Mission* was started on August 2019 with the aim of providing "piped water supply" to all Indian households in five years and improve their standard of living. These two policies constitute a crucial step towards India's prospects of achieving SDGs:3&6.

Background Research

The landmark Rio Declaration in 1992, resulted in a commitment to sustainable development made by governments all over the world. This commitment was reiterated in Johannesburg in 2002, where eradicating poverty, promoting sustainable production & consumption, and safeguarding the environment were prioritized for achieving sustainable development. However, there exists a gap in what has been said and the actions taken. Lack of focus on sustainable development, financial constraints, lower commercial viability, inadequate human, technical, and institutional capacity, limited public awareness, and lifestyle changes emerge as the main reasons for this gap (Miyazawa, 2012). The "Millennium Development Goals (MDGs)" were adopted by UN member countries in 2000, for

enhancing the living conditions of world's poor. Despite unmet targets, MDGs generated public & policy support, ensuring efficient channelling of funds and noteworthy success (Griggs et al, 2014). This led to the establishment of a new sustainable development framework constituting "Sustainable Development Goals", towards eradicating poverty and address global threats to the humanity.

The sustainable development framework focuses on four interrelated goals: economic progress, social inclusivity, environmental sustainability, and good governance, that are crucial for individual and societal well-being. The universal idea of "leaving no one behind" constitutes the foundation of SDGs (Kabeer, 2016). The developmental objectives of India align closely with UN SDGs, moreso the country is anticipated to undertake a significant role in its global success (Chatterjee, et al, 2015). *NITI Aayog* coordinates with the states on SDGs to chalk out their development programmes (David, 2018). A study by Khalid, et al. (2021) found that experts believe that the SDGs 2, 3, 5, 6, 7 & 10 are of top priority, and require most attention of government.

This study centres mainly around the progress of India in attaining SDG-6: "availability and sustainable management of water and sanitation for all", and its linkages with SDG-3: "health and well-being for all" (UN Portal). Several steps have been taken by Indian government in this direction, National Rural Health Mission, Ayushman Bharat-PM Jan Aarogya Yojana, SBM, JJM and so on (Sahoo & Sriram, 2019; Sriram & Sahoo, 2015). Mainly *Swachh Bharat Abhiyan (SBM)* and *Jal Jeevan Mission (JJM)* are analysed here.

Anuradha et al. (2017) finds that open defecation is a "way of life" in most developing countries, but this practice is regarded as the most dangerous to one's health and the environment. As per a report by Amnesty International (2010), there are also non-health consequences of a lack of sanitary facilities, especially for females, which include absence of privacy & security, poorer school attendance, and violation of basic human dignity. The *Swachh Bharat Mission (SBM)* was initiated to achieve a cleaner and open-defecation-free (ODF) India (National Portal of India, GoI).

Previously similar initiative, "*Nirmal Bharat Abhiyan"*, under Total Sanitation Campaign, was undertaken to achieve universal household sanitation by 2012. However, despite government funding, it did not achieve expected results (Chaudhary, 2017). The *Swachh Bharat Mission* is considered to be world's largest behaviour change initiative and the mission's emphasis has changed from "outputs" (such as toilet construction), to "behavioural objectives" (i.e. making the country open-defecation-free) (Mohapatra, 2019).

Water scarcity is becoming an increasingly serious issue in several parts of the world, and conflicts and climate change are worsening the situation. Furthermore, water pollution is a major issue around the world, affecting both human health and environment (UN Portal). Water resources of India are severely strained because it constitutes for 17 percent of global population while possessing mere 4 percent of world's water resources (Sarkar & Bharat, 2021). The demand for water is going to be twice the water supply in India by 2030 (NITI Aayog, 2019).

While talking about the social component of unavailability of safe drinking water, a study by (Singh & Singh, 2023) in Gaya district, Bihar shows how unavailability of drinking water forced an adolescent girl to locate for water sources that affected her education. Singh (2022) discusses various steps undertaken by India since independence to address its water needs, such as building infrastructure and institutional systems like dams and irrigation canals.

India has been party to a number of environmental and human rights accords, advocating water and sanitation rights for its citizens. Indian Constitution specifically does not mention water or sanitation rights, but Article 262 of Indian Constitution; Indian Easements Act 1882; Water (Prevention & Control of Pollution) Act-1974; Environment (Protection) Act-1986 do address these issues. To guarantee effective water resource management, India adopted the National Water Policy in 1987 that was further revised in 2002 and 2012. Indian judicial system is playing active role in interpretation of right to access of clean water, as part of "Right to Life" under Article 21 of the Constitution.

India government's *Jal Jeevan Mission* programme strives to deliver "safe and adequate drinking water to all" Indian homes by 2024, via household tap connections with ambitious aim of universal drinking water coverage. This mission's expected goals include improved rural community health, reduced drudgery and empowerment of women, lower dropout rates for upper primary school girls, and increased employment prospects for rural areas (Jal Jeevan Mission, GoI).

Objectives and Components of SBM & JJM

The *Swachh Bharat Abhiyan* is considered to be the "largest behaviour-change programme in the world" that aims to transpire a mass behavioural change on hygiene and cleanliness, and improve their lives. The *Swachh Bharat Mission* achieved its target of 100% ODF India by 2019. It has two components: SBM Grameen, and SBM Urban. Major objectives of *Swachh Bharat Mission-Grameen* include: promoting cleanliness, hygiene and ODF behaviour in rural-India; encourage community and local bodies (PRIs) towards practising safer sanitation through awareness & health education; promoting cost-effective technologies for safer sanitation; accessibility of safe solid waste management practices in villages; improve social inclusion and sanitation in marginalised groups, and women; and develop community-managed scientific sanitation systems. (Ministry of Drinking Water & Sanitation, 2017)

Major objectives of *Swachh Bharat Mission-Urban* (SBM-U) include: total removal of open-defecation and manual scavenging, nudging behavioural change, developing awareness on public health and sanitary hygiene, and capacity building of municipalities and ULBs for achieving garbage-free cities by 100% garbage collection, segregation of wastes, scientific solid-waste management practices, cleanliness and hygiene in public places, optimum treatment and reuse of used water, and conversion of dumpsites into green zones. (MoHUA, 2017)

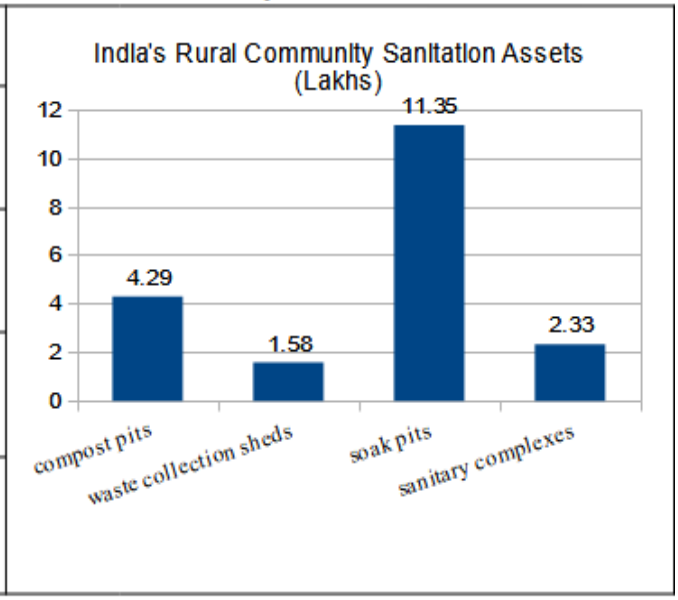
Likewise, *Jal Jeevan Mission* seeks to provision drinking water supply in sufficient quantity and quality to every rural household and at an affordable charge. Major objectives of JJM include: piped water connection to all rural households, in drought-prone areas and deserts at priority, and at Anganwadis, wellness centres, community buildings, schools, etc; encouraging community ownership, management and awareness on safe drinking water; and ensuring a sustainable water supply system.

Achievements of SBM & JJM

India achieved 100% open-defecation-free (ODF) status by October, 2019. Government of India revised its provisions to evaluate the success of SBM 2.0, that introduced 'ODF+' status for "a village which sustains its ODF status, ensures solid & liquid waste management and is visually clean." The ODF+ status is further divided into 3 categories: Aspiring, Rising and Model (Dept. of Drinking Water & Sanitation, 2021). At present, out of total 5.92 lakh villages in India, 66.1% have achieved the ODF+ status. Moreover, out of all ODF+ villages, 67.3% are aspiring, 11.8% are rising, and 20.8% are ODF+ model villages. A large number of community assets including 1,246 *GOBARdhan* plants for waste management, have also been developed. (Box 1, SBM-G Dashboard, GoI)

Box 1: India's ODF+ Villages and Rural Community Assets

Total villages	5,91,758
ODF+ villages	3,91,032 (66.1%)
Aspiring ODF+	2.63 lakh (67.3%)
Rising ODF+	46,094 (11.8%)
Model ODF+	81,308 (20.8%)



Source: Based on Data from SBM-G Dashboard, GoI

Indian government introduced ODF+ and ODF++ status for evaluating the success of SBM 2.0 in cities. According to it, "A city/ward/ workcircle can be notified as *SBM ODF+*, if at any point of the day, not a single person is found defecating and/or urinating in the open, and all community and public toilets are functional and well maintained." It also defines "*SBM ODF++*" city if, along with SBM ODF+ criteria, it fulfils additional criteria of "entire faecal sludge/septage and sewage is safely managed and treated, with no discharging and/or dumping of untreated faecal sludge/septage and sewage in drains, water bodies or open areas." According to SBM(U) Dashboard, at present 62.98 lakh household toilets are provided (target 58.99 lakh); 6.36 lakh community toilets are constructed (target 5.07 lakh); over 90,000 wards have 100% door to door waste collection facility; 3547 cities (73%) have been certified the status of ODF+ while 1191 cities (24%) have been given the status of ODF++. This shows the significant progress made by SBM 2.0.

The *Jal Jeevan Mission* has been able to achieve a significant progress since its launch in August, 2019. The rural households in August, 2019 were 19.41 crore from which only 3.23 crore (16.67%) had a tap water connection. Currently, 12.73 crore (65.61%) households have a tap water connection in 2023. Hence, 9.5 crore households are provided with tap water supply through the JJM Mission. States such as Goa, Haryana, Punjab & UTs such as Andaman & Nicobar Islands, Puducherry, etc have attained *"Har Ghar Jal"* status, i.e. all their households are provided with tap water supply. That is, a total of 68,434 villages; 42,518 panchayats; 68 districts have achieved *"Har Ghar Jal"* status. There are 2087 active laboratories across the country to test water quality. (JJM Dashboard, GoI)

Challenges in Policy Implementation

Many studies were analysed by Verkuilen (2023) in which it was found that despite SBM, open defecation remained prevalent, with varying rates: 15 percent in Jharkhand (Vu et al, 2022), 30-40 percent in Tamil Nadu & MP (Namdev & Narkhede, 2020; Das & Crowley, 2018; Anuradha et al, 2017), and 44 percent in one multiple-state survey (Gupta et al., 2020). Few researchfound very little or

no open defecation, but they used small sample size or self-reported data in personal interviews, that might contain biasedness (Datta et al, 2021; Mavila & Francis, 2019).

In a study by Dandabathula et al. (2019), Acute Diarrhoeal Disease (ADD) outbreaks data from 2010-2018 were investigated. ADD outbreaks per annum in last two years of SBM regime (2017 & 2018) was found to be lower compared to other years during the study period. Peak season of May-August, constitutes 55 to 60 percent of ADD epidemics in a year; however, overall outbreaks in 2018 were 46%, which was found to be much lower than typical peak season range.

As per WHO, open defecation significantly increases the risk of spread of infectious diarrhoeal disease such cholera. In developing nations, unhygienic disposal of human waste, unsafe drinking water and insufficient hygiene conditions, are primary factors of sickness and mortality (Heijnen, et al., 2014). Anuradha et al., (2017) found in a study of rural Tamil Nadu that, household latrines and community toilets were used by 62.5% and 4.3% of people, respectively, while open defecation prevalence was 33.1% among the respondents. Moreover, significant relationship was observed between lower standards of living and practice of open defecation.

Looking at the social component of water distribution system in rural areas, it was revealed that, abolition of open defecation and provision of piped water supply to homes has protected women's self-esteem and rural sanitation index has risen (Singh & Singh, 2023). Moreover, meaningful participation of women in developmental schemes might help the projects become more sustainable, and ensure that infrastructure generates greatest socio-economic advantages enabling sustainable development (Singh & Singh, 2023). Also, community-based water management and local governments can play important role in water resource management (Brar, 2022).

Linking with India's Achievement in SDG Goals on Health & Sanitation

India's high growth strategy followed in earlier years, had not sufficiently trickle down to the lower segments of the masses, and resulted in greater variability of growth across the states. The variability of growth and infant mortality rate (IMR), measured by co-efficient of variation, had increased in 1990s and first half of 2000s (Sahoo, 2008). This necessitated focused approach in dealing with India's health and sanitation indicators.

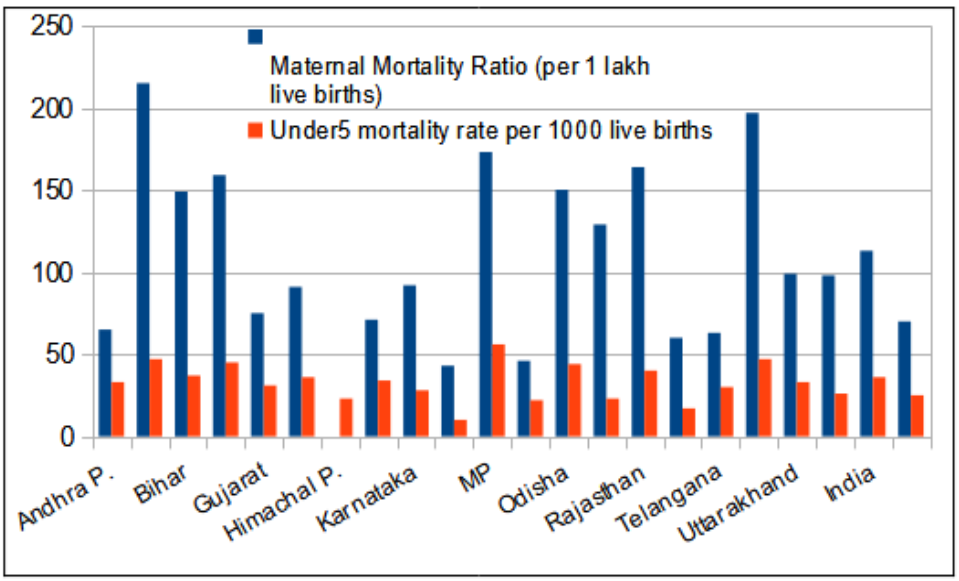
According to the UN, India has shown limited progress in overall 17 goals of SDG until 2023. India ranks 112 out of 166 countries with a score of 63.4 below the regional average of 67.2. Data from *Sustainable Development Report 2023* (Sachs et al, 2023) shows that in SDG 3 & 6, major challenges exist for India, although its performance in these goals is moderately improving. In case of SDG 3, "major challenges" are seen in 4 health & wellness indicators out of 14, "significant challenges" exist in 5 indicators, "challenges remain" in 3 indicators, whereas "goals are achieved" in 2 indicators namely, new HIV infections and Adolescent fertility rate.

In case of SDG 6, "major challenges" remain in 2 indicators out of 5, which are Anthropogenic wastewater that receives treatment and population using basic sanitation services. "Significant challenges" are seen only in freshwater withdrawal, "challenges remain" in basic drinking water services, whereas "goal is achieved" in scarce water consumption embodied in imports.

In case of SDG Goals on Health defined indicators like MMR, U5MR etc are included. In case of Maternal Mortality rate, India's target is to reduce it to 70 from 113, in 2021. The best performer in MMR is Kerala (43) whereas worst is of Assam (215) per lakh live births. In case of Under 5 Mortality

Rate India stands at 36 per thousand live births in 2021 and target is to decrease it to 25 level. Kerala remains the best performer (10) and MP is the worst (56) in U5MR. (Chart 1)

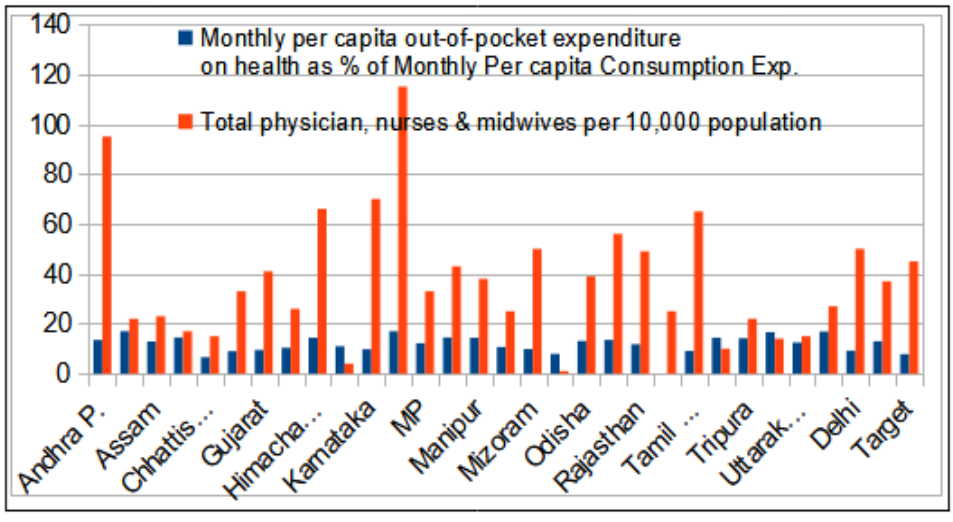
Chart 1: State-wise MMR and U5 Mortality Rates in India



Source: Based on data from Sustainable Development Solutions Network (2012)

In case of per capita monthly out-of-pocket health expenses as percentage of monthly consumption expenditure, in Indian states, it ranges from 6.6% (Chhattisgarh-top performer) to 17% (Arunachal Pradesh- worst), against the all-India average of 13.0 with target of 7.83 (in 2021). In case of total number of health officials (physicians, nurses & mid-wives) per ten thousand population, Nagaland remains at the bottom (1) and Kerala at the top (115), against the all-India average of 37 with target of 45 in 2021. (Chart 2)

Chart 2: Performance of Indian States in Select Indicators of SDG 3

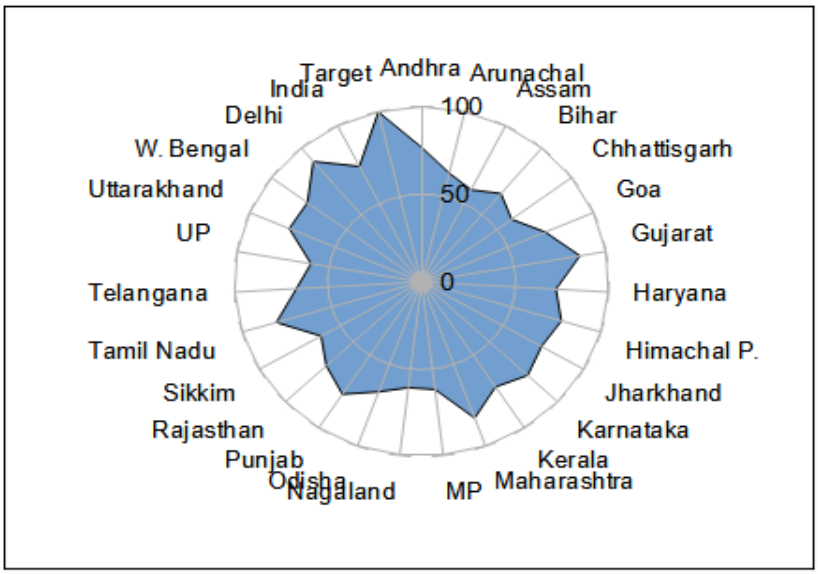


Source: Based on data from Sustainable Development Solutions Network (2012)

Performance of Indian States on Indicators of SDG 3 & 6

On SDG-3 overall indicators in 2021, the lagging states are: Arunachal Pradesh, Assam, Chhattisgarh, MP, Sikkim, Nagaland, and UP with scores just around 60. These states are classified as Performer States (with SDG3 Index Score: 50-64), whereas rest of the states are Front Runners (SDG3 Index Score: 65-99). In SDG 3, least performer is Assam and best performer is Gujarat. Top three performing state in SDG 3 are Gujarat, Maharashtra and Tamil Nadu with scores above 80. (Chart 3)

Chart 3: SDG 3 Index Score in India and its States



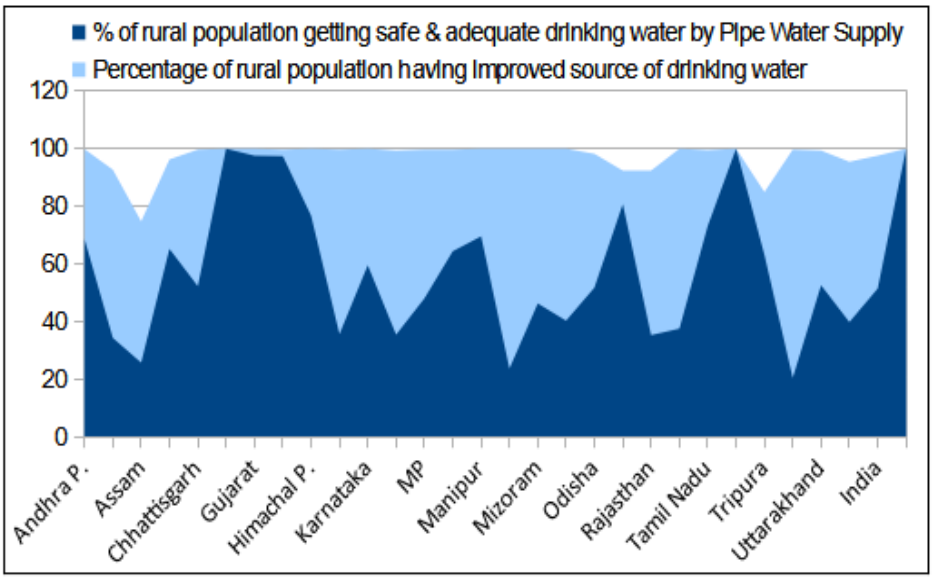
Source: Based on data from Sustainable Development Solutions Network (2012)

Among other health and well-being parameters of SDG 3, "Percentage of 9-11 months children fully immunized", and "Percentage of institutional deliveries out of total deliveries" are prominent. Indian states report children immunization percentage ranging from 54% to 100%, against the all-India average of 91, highest from Maharashtra and lowest from Nagaland. Other top child immunizing states are Telangana (98%) and West Bengal (97%), and bottom immunizing states are Sikkim (62%), Arunachal Pradesh (68%) and Rajasthan (69%). Likewise, percentage of institutional deliveries among Indian states, ranges from 60.4% to 99.9%, against all-India average of 94.4%. Telangana, Karnataka, Tamil Nadu & Kerala are top performers in institutional deliveries- all with 99.9% and Meghalaya 60.4%, Manipur, and Nagaland are bottom performers. (Chart 3)

India's SDG:6 goals cover indicators like rural population getting safe and adequate piped drinking water, rural population with improved source of drinking water and so on. In case of share of rural population with safe piped water supply, India's achievement in 2021 is 51.36% (target 100%). JJM data shows piped water supply to over 65% rural households in 2023, which shows there has been a significant progress since launch of JJM. In case of share of rural population with improved source of drinking water, India's achievement is 97.44% (target 100%), which shows that India is close to achieving this target.

In case of state-wise availability of piped water supply in rural areas, top performing states are Telangana and Goa (both 100%) and worst performing states are UP (20.35%), Meghalaya (23.49%) and Assam (25.70%). Likewise, in case of rural population with improved source of drinking water, top 9 performing states have already achieved 100% target such as: Goa, Gujarat, HP, Karnataka and so on. However, in this indicator, lagging states are Assam (74.72%) and Tripura (84.84%). (Chart 4)

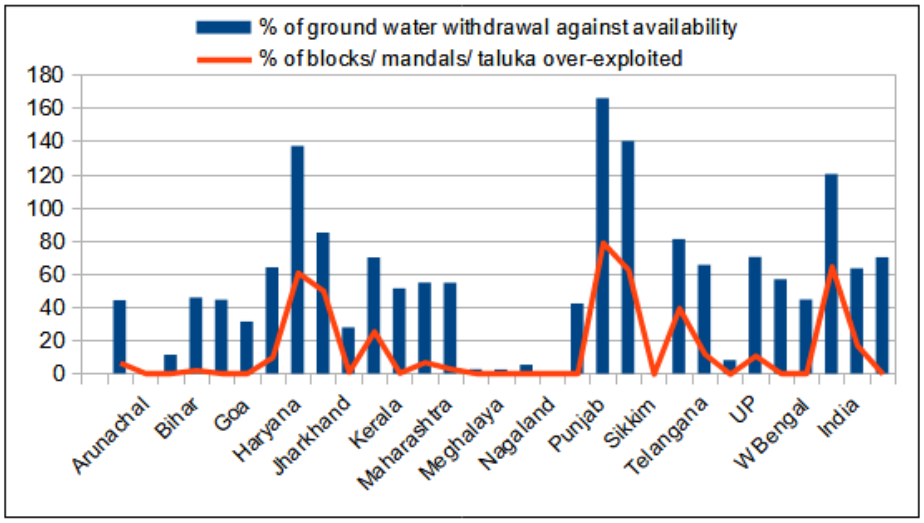
Chart 4: India's State-wise achievement in SDG 6 in Water Supply



Source: Based on data from Sustainable Development Solutions Network (2012)

In case of ground water withdrawal against availability, India's position is 63.35% (target 70%) in 2021. In case of state-wise situation, Haryana, Punjab and Rajasthan withdraw much more groundwater than available (more than 135%), whereas Sikkim and Arunachal Pradesh withdraw much less than available (both less than 0.4%). In case of percentage of blocks overexploiting groundwater, India's position is at 17.24% in 2021 (Target 0%). Again, more than 60% of blocks of Punjab, Haryana and Rajasthan overexploit groundwater, whereas numerous states (13) are at 0% over-exploitation.

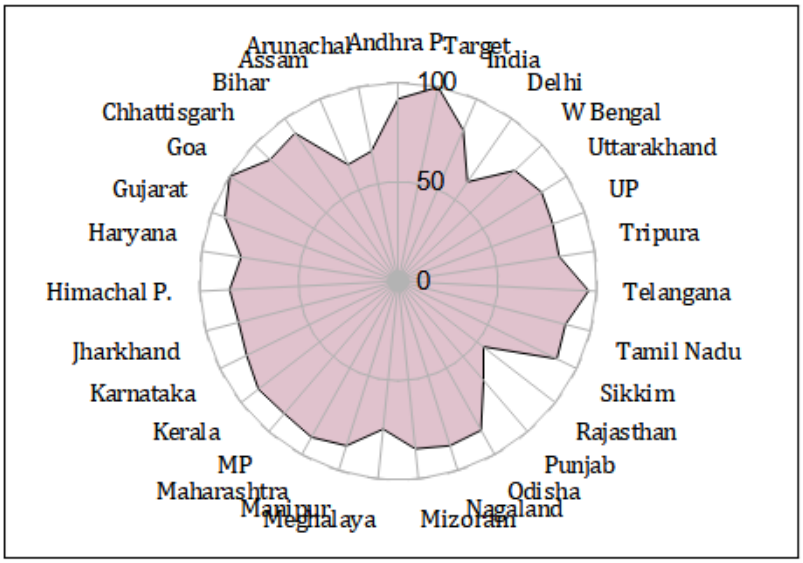
Chart 5: India's State-wise SDG 6 Position in Ground Water Withdrawal & Over-Exploitation



Source: Based on data from Sustainable Development Solutions Network (2012)

In case of overall achievement in SDG 6, India's score is 83 in 2021 (target 100). Top performing states are Goa (100%) and Telangana (96%), and bottom performing states are Rajasthan (54%), Delhi (61%) and Assam (64%). (Chart 6)

Chart 6: SDG 6 Index Score in India and its states



Source: Based on data from Sustainable Development Solutions Network (2012)

Discussion and Evaluation

Coming to India's achievement on health and sanitation under SBM Abhiyan, out of all villages in India, 66.1% have achieved ODF+ status, and out of all ODF+ villages, only 20.8% are ODF+ model villages. India has to go a long way before all villages come under ODF+ model villages. To achieve this, India has to further increase the community assets development for sanitation and waste management. Likewise, 73% cities have achieved the status of ODF+, while 24% cities have been given the status of ODF++. Despite the significant progress made by SBM 2.0, more than three fourth cities are yet to be covered under ODF++ status.

Due to progress through *Jal Jeevan Mission,* 65.61% households have a tap water connection in 2023. Only few states and UTs have achieved *"Har Ghar Jal"* status, i.e. all households are provided with tap water supply. Significant amount of work is still to be done to provide all households of all states with tap water supply. Some studies are showing the results of the progress in health and sanitation, in the form of decline in Diarrheal outbreaks. But it is pretty early, sustaining these over the long run will be crucial, as due to climate change, India is becoming more prone to various illnesses and diseases. In such cases, robust health and sanitation measures and adequate health infrastructure will be crucial.

The *Ayushman Bharat-PM Jan Aarogya Yojana(AB-PMJAY)* health protection scheme of Indian government for lower segments of population is doing a good service, in providing health insurance cover and access to better healthcare through empanelled hospitals (Sahoo & Sriram, 2022). This supports India's achievement in SDG 3, but *AB-PMJAY* does not lead to creation of additional health infrastructure, which can continue to be a challenge towards achievement of SDG health goals in MMR, IMR, U5MR and so on. In case of SDG 3 & 6, India has to take measures for improving its indicators tagged as "major challenges" and "significant challenges", on a priority basis. India and its states have fully achieved only in very few indicators of health, sanitation and water supply.

India has to prioritize its focus on few laggard sates such as MP, Chhattisgarh, Rajasthan, UP and majority of North Eastern States, so far as health indicators are concerned. In case of water resources and water supply, India has to focus more on the laggard states such as Haryana, Punjab, Rajasthan, UP and Assam along with other North East states. Crucial step here would be intervention in health, sanitation and water supply infrastructure at the grass roots level, where community-based management with active role of local governments can play important role.

Conclusion

India's achievement in health and sanitation goals have been remarkable over the decades. However, there remain significant challenges in the impact of *Swachh Bharat Abhiyan* and *Jal Jeevan Mission* as public policies on health and sanitation, in spite of their achievements such as, improvement in sanitation coverage to hundred percent at present, and increase in household tap water coverage to two-third share at present. The analysis here focused on India's prospects of attaining sustainable development goals (SDGs) on health and sanitation, particularly through public programme intervention of *SBM* and *JJM*. There exist several challenges before these two programmes, that might delay India's prospects of attaining SDG targets on health and sanitation. Only a fifth of ODF+ villages have attained model villages status. India has to go a long way before all villages become ODF+ model villages. To achieve this India has to further increase the community assets development for sanitation and waste management. Likewise, despite significant progress made in SBM2.0, over three-fourth cities are yet to be covered under ODF++ status.

To attain fully on all these fronts, India has to focus on the identified states, that are still lagging behind. Crucial step here would be intervention in health, sanitation and water supply infrastructure at the grass roots level, where community-based management with active role of local governments can play important role. It may be reminded that, SBM and JJM are deeper behavioural change programmes, with significant influence on social factors and gender issues. *Swachh Bharat Abhiyan* had started with a revolutionary public drive from the topmost executive leadership of the country. This mission zeal has to transpire again to the public personnel and sustain in the longer term, so as to overcome the challenges and achieve the targeted SDG Goals.

References

Amnesty International. (2010). Kenya: Insecurity and indignity: Women's experiences in the slums of Nairobi, Kenya,https://www.amnesty.org/en/documents/afr32/002/2010/en/

Anuradha, R, Dutta, R, Raja, JD, Lawrence, D, Timsi, J, et al (2017). Role of community in Swachh Bharat Mission: Their knowledge, attitude and practices of sanitary latrine usage in rural areas, Tamil Nadu. Indian journal of community medicine, 42(2), 107.

Brar, J. K. (2022). The Issues and Concerns related to Water and Sanitation: The Role of Local Government. Human Rights and Social Responsibility: A Reflection, 157.

Chatterjee, S, Hammill, M.J., Kumar, N, & Panda, S. (2015). Assessing India's Progress in Achieving the Millennium Development Goals: Key Drivers of Inter-state Variations. September, UN ESCAP.

Chaudhary, A, (2017). Swachh Bharat mission-need, objective and impact. International Journal for research in Management and Pharmacy, 6(2), 24-28.

Dandabathula, G, Bhardwaj, P, Burra, M, et al. (2019). Impact assessment of India's Swachh Bharat Mission–Clean India Campaign on acute diarrheal disease outbreaks: Yes, there is a positive change. Journal of family medicine and primary care, 8(3), 1202.

Das, P., & Crowley, J. (2018). Sanitation for all: a Panglossian perspective?. Journal of Water, Sanitation and Hygiene for Development, 8(4), 718-729.

Datta, A., Somani, A., Karmakar, N., & Nag, K. (2021). A study on knowledge and practices regarding swachhbharat mission among urban population of Agartala city, North East India. Medical Journal of Dr. DY Patil University, 14(5), 529-537.

David, M. P. C. (2018). Sustainable development goals (SDGs)-challenges for India. Indian Journal of Public Health Research and Development, 9(3), 1-5.

Department of Drinking Water and Sanitation, (2021). Guidelines- revision of criteria for declaration of villages as ODF Plus, Ministry of Jal Shakti, GoI.

Dept. of Drinking Water & Sanitation, (2022). National Report of Functionality Assessment of Household Tap Connections, GoI. https://jaljeevanmission.gov.in/sites/ default/files/2022-10/national_report_of_functionality_assessment_2022.pdf

Griggs, D., Smith, M. S., Rockström, J., Öhman, M. C., Gaffney, O., Glaser, G., Kanie, N., Noble, I., Steffen, W., & Shyamsundar, P. (2014). An integrated framework for sustainable development goals. Ecology and Society, 19(4).

Gupta, A., Khalid, N., Deshpande, D., Hathi, P., Kapur, A., Srivastav, N., ... & Coffey, D. (2020). Revisiting open defecation evidence from a panel survey in rural North India, 2014–18. Economic & Political Weekly, 55(21), 55-63.

Heijnen, M., Cumming, O., Peletz, R., Chan, G. K. S., Brown, J., et al. (2014). Shared sanitation versus individual household latrines: a systematic review of health outcomes. PloS one, 9(4), e93300.

Jal Jeevan Mission Portal, Department of Drinking Water and Sanitation, Ministry of Jalshakti, Government of India, at https://jaljeevanmission.gov.in/

JJM Dashboard, Department of Drinking Water and Sanitation, Ministry of Jal Shakti, GoI, https://ejalshakti.gov.in/jjmreport/JJMIndia.aspx

Kabeer, N. (2016). "Leaving no one behind": the challenge of intersecting inequalities, in World social science report, 2016: Challenging inequalities; pathways to a just world, pp. 55–58.

Khalid, A. M., Sharma, S., & Dubey, A. K. (2021). Concerns of developing countries and the sustainable development goals: Case for India. International Journal of Sustainable Development & World Ecology, 28(4), 303-315.

Mavila, A. D., & Francis, P. T. (2019). Impact of Swachh Bharat Abhiyan on residents of Cochin corporation. Indian Journal of Community Medicine: Official Publication of Indian Association of Preventive & Social Medicine, 44(Suppl 1), S19.

Ministry of Drinking Water & Sanitation.(2017). Guidelines for Swachh Bharat Mission-Gramin, GoI.https://swachhbharatmission.gov.in/sbmcms/writereaddata/images/pdf/Guidelines/Complete-set-guidelines.pdf

Ministry of Housing & Urban Affairs (MoHUA). (2017). Guidelines for Swachh Bharat Mission-Urban, GoIhttp://swachhbharaturban.gov.in/writereaddata/SBM_Guideline.pdf

Ministry of Housing & Urban Affairs (MoHUA). (2020). Declaring your City/Town SBM ODF+ & SBM ODF++ Toolkit for Urban Local Bodies, GoI, http://swachhbharaturban.gov.in/writereaddata/SBMODFBook24May20.pdf?id=13j48tn4c0wzu 2zr

Miyazawa, I. (2012). What are Sustainable Development Goals? Institute for Global Environmental Strategies. http://www.jstor.org/stable/resrep00768

Mohapatra, G. (2019). Projected behavioural change in Swachh Bharat Mission: a public policy perspective. Indian Journal of Public Administration, 65(2), 451-474.

Namdev, G., & Narkhede, V. (2020). Reasons of open defecation behaviour in rural households of Bhopal, Madhya Pradesh, India. National Journal of Community Medicine, 11(03), 103-106.

National Portal of India, Ministry of Electronics & Information Technology, Government of India, GoI, at https://www.india.gov.in/

NITI Aayog. (2019). Composite Water Management Index, GoI. https://social.niti.gov.in/uploads/sample/water_index_report2.pdf

NITI Aayog. (2021). SDG India Index and Dashboard 2020-21: Partnerships in the Decade of Action, Government of India.

Sachs, J.D., Lafortune, G., Fuller, G., Drumm, E. (2023). Implementing the SDG Stimulus. Sustainable Development Report 2023. Paris: SDSN, Dublin: Dublin University Press, 2023. 10.25546/102924

Sahoo M. K. & Sriram, D. (2019). Agility in Governance Through Public Health Initiatives: The Case of India's Ayushman Bharat -National Health Protection Mission, GNLU Journal of Law, Development and Politics, 9(2), Oct, 25-38.

Sahoo M. K., Sriram D. (2022). Ayushman Bharat- Pradhan Mantri Jan Aarogya Yojana: Implications for the Future of Public Health in India, Liberal Studies, 7(2) July-December, pp.189-203

Sahoo, M. K. 2008. An Exploration into Dimensions of Growth and Backwardness in India, Parikalpana: KIIT Journal of Management, Volume 5 (1 & 2), Jan-Dec,1-19.

Sarkar, S. K., & Bharat, G. K. (2021). Achieving Sustainable Development Goals in water and sanitation sectors in India. Journal of Water, Sanitation and Hygiene for Development, 11(5), 693-705.

SBM-G Dashboard, Department of Drinking Water and Sanitation, Ministry of Jal Shakti, GoI,https://sbm.gov.in/sbmgdashboard/statesdashboard.aspx

SBM(U) Dashboard, Ministry of Housing and Urban Affairs, GoI, http://swachhbharaturban.gov.in/dashboard/

Singh, R., & Singh, S. K. (2023). JEEVIKA Community Based Organizations Role in Implementation of Pipe Water System under Jal Jeevan Mission: A Study of Gaya District. IJFMR-International Journal For Multidisciplinary Research, 5(3).

Singh, S. (2022). Achieving Sustainable Development Goal 6 in India: Transforming Lives through Localization, in Conference Proceedings of International Academic Conference of the Sustainable Development Goals:

Why It Matters, 5-7 Oct, Utah, USA

Sriram, D. & Sahoo, M. K., (2015), Alternative Service Delivery in Indian Health Sector: Neglected Areas in PPP Projects, Journal of Governance and Public Policy, 5(2), July-Dec, 2-9.

Sustainable Development Solutions Network. (2012). A Framework for Sustainable Development. Sustainable Development Solutions Network.

Swachh Bharat Mission-Grameen Portal, Department of Drinking Water and Sanitation, Ministry of Jal Shakti, GoI, https://swachhbharatmission.gov.in/SBMCMS/about-us.htm

UN Portal, Sustainable Development Goals, Department of Economic and Social Affairs, United Nations, at https://sdgs.un.org/goals

Verkuilen, A., Sprouse, L., Beardsley, R., Lebu, S., Salzberg, A., & Manga, M. (2023). Effectiveness of the Swachh Bharat Mission and barriers to ending open defecation in India: a systematic review. Frontiers in Environmental Science, 11, 565.

Vu, S, Jain, A, Harrison, C, Ghimire, P, &Graham,J.(2022). "Someone should be there to take care of it": a case study of users' views of managed shared sanitation facilities in Jharkhand, India. American journal of tropical medicine & hygiene, 106(4), 1135.