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Agenda 2030 for SDG-6: Water, Sanitation and Hygiene in India

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***Abstract*—** *The 2030 Agenda of the United Nations comprises 17 Sustainable Development Goals (SDGs) and 169 sub-targets which serve as a global reference point for the transition to sustainability. The agenda acknowledges that different issues such as poverty, hunger, health, education, sanitation and hygiene, gender equality, environmental degradation, among others are integrated and can therefore only be addressed together. The sanitation target of the Sustainable Development Goals is that everyone should have a 'safely-managed' sanitation facility by 2030 and that open defecation be eliminated. It covers facilities for handwashing with soap, menstrual-hygiene management, and food hygiene, but only handwashing with soap is monitored by WHO/UNICEF. It is clearly correct therefore that sanitation is a major component of the United Nations Sustainable Development Goals (SDGs) (United Nations General Assembly 2015a), of which Target #2 of Goal #6 is to: "By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations". Water and sanitation services are critical for public health. The purpose of this paper is to raise the importance of these services is reflected in SDG 6 and the associated targets 6.1, 6.2 and 6.3. Much progress remains to be made to achieve these targets, but it is already becoming clear that greater ambition is needed.*

I. INTRODUCTION

Over the last decades, sustainable development has gained the particular attention of a wide range of decisional factors. These decisional factors reinforce that the prosperity of people and society is possible with the aid of continual, inclusive, and sustainable economic growth of all countries and regions (Fleaca, E et.al; 2018). The high-level stakeholder's commitment to sustainable development was exhaustively defined in the 2030 Agenda for Sustainable Development issued by the United Nations. The fundamental changes were clearly captured and defined within 17 universal sustainable development goals (SDGs) and related targets, balancing all facets of sustainable development such as economic, environmental, and social concerns. Since United Nations adopted the global Sustainable Development Goals (SDGs) for the next 15 years (2016+2030), sustainable development will further become a core concept and main principle to guide global and national economic and social development (Zhu, D. 2017).

India along with other countries has signed the declaration on the 2030 Agenda for Sustainable Development, comprising of seventeen Sustainable Development Goals (SDGs) at the Sustainable Development Summit of the

United Nations in September 2015. SDGs are comprehensive and focus on five Ps-People, Planet, Prosperity, Peace, and Partnership. Among the vital goals of SDGs ensure water and sanitation for all has always remained a core theme in sustainability. This study tries to examine this goal in a global context and at the same time their achievement in the Indian point of view.

II. MAJOR THEMES AND TARGETS IN SDG-6

"As soon as India gained independence in 1947, it committed to providing its citizens with water and sanitation. Despite huge progress in gaining access to clean water and sanitation, billions of people -- primarily in rural areas -- still lack these basic necessities. Globally over 673 million humans practice open defecation, and one in three do not have access to safe drinking water. Two out of 5 humans do not have a basic hand-washing facility with soap and water" (UNO;2022). The major theme of SDG 6 was to ensure access to water and sanitation for all.

Targets	Indicators
6.1 - By 2030, achieve universal and equitable access to safe and affordable drinking water for all	**6.1.1** - Proportion of population using safely managed drinking water services
6.2 - By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations	**6.2.1** - Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water
6.3 - By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally	**6.3.1** – Proportion of wastewater safely treated **6.3.2** - Proportion of bodies of water with good ambient water quality
6.4 - By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity	**6.4.1** – Change in water-use efficiency over time **6.4.2** - Level of water stress: freshwater withdrawal as a proportion of available freshwater resources
6.5 - By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate	**6.5.1** – Degree of integrated water resources management implementation (0-100) **6.5.2** - Proportion of transboundary basin area with an operational arrangement for water cooperation
6.6 - By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes	**6.6.1** - Change in the extent of water-related ecosystems over time
6.A - By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies	**6.A.1** - Amount of water- and sanitation-related official development assistance that is part of a government-coordinated spending plan
6.B - Support and strengthen the participation of local communities in improving water and sanitation management	**6.B.1** - Proportion of local administrative units with established and operational policies and procedures for participation of local communities in water and sanitation management

III. OBJECTIVES

This study seeks to accomplish the following objectives:

- To assess the progress of SDG 6 on clean drinking water in India.
- To undertake an assessment of the progress of sanitation situation in India as per SDG 6 indicators.
- To discuss the key learning and suggest policy implications emerging from the study.

IV. SDGS ON WATER AND SANITATION

SDG 6 (among the 17 goals formulated by the UN to be achieved by 2030) aims to expand access to basic water and sanitation services and close the gaps in service quality. There are a total of 8 targets (6 outcome-oriented targets and 2 means of achieving targets) that specify SDG 6 as a whole, with 11 indicators to represent the metrics for tracking the achievement of the targets. SDG 6 implies not only delivery of water but also that water is safe to drink and is continuously available. The eight targets within Goal 6 are closely linked to one another, as well as to other SDGs. Most of the SDGs have positive interlinkages with SDG 6, but there are some targets within other SDGs which are in potential conflict with SDG 6. For example, increasing water and sanitation access reduces poverty and has positive linkages with health and education outcomes. However, agricultural activities (SDG 2) and energy services (SDG 7) may have negative impacts on ambient water quality and ecosystems. The interrelationships between SDG 6 and the other SDGs are summarized in Supplementary Although SDG 6 deals with eight targets, this paper primarily focuses on Targets 6.1: 'by 2030, achieve universal and equitable access to safe and affordable drinking water for all' and 6.2: 'by 2030, achieve access to adequate an equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations'. (Bharat G.K;2018).

V. PROGRAMMES AND POLICIES IN THE WATER SECTOR

As per the Constitution of India, water is a state subject and the role of the Central Government is limited. The Constitution also mandates for devolution of power from states to local bodies such as Gram Panchayats and Urban Local Bodies. Such devolution of power from state to local bodies in water and sanitation sectors is still deficient. However, the Central Government

has framed several laws and formulated policies and programmes at the national level and has been implementing the same in consultation with the states. Important policies and programmes formulated and enacted in the water sector are National Water Policy (NWP) (2012), which is undergoing a revision, National Water Mission (NWM) of India (2008), Draft Water Framework Law of India (2016), Model Ground Water Bill (2016), *Atal Bhujal Scheme* (2019) and *Har Ghar Jal* Programme (2019). The NWP 2012 calls for a common integrated vision for the management of water resources (a common pool community resource held by the state under public trust doctrine to ensure equitable distribution to all) and its governance. It deals with several aspects such as enhancing water availability, water demand management through efficient water use practices, water pricing, conservation of water bodies, water supply and sanitation, and management of transboundary rivers.

The NWM of India (2008) was created for the implementation of the National Action Plan on Climate Change (NAPCC). The main objective of NWM is being conservation of water, minimizing wastage and ensuring its more equitable distribution both across and within states through integrated water resources development and management. A number of programmes, such as 'Catch the rain, where it falls, when it falls' and 'Sahi Fasal' (The Right Crops), are being undertaken by NWM at all India scale.

The budget allocation of the Government of India for the implementation of Har Ghar Jal Mission has been allocated Rs 10,000 crores (100,000 million) in 2019–2020 and Rs 23,500 crores (235,000 million) in 2020–2021 and Rs. 50,000 crores (500,000 million) in 2021–2022 for drinking water and Rs. 10,000 crores (100,000 million) for sanitation (Ministry of Jal Shakti/PIB India 2020, 2021). JJM (Urban) launched in 2021 intends to spend an amount of Rs 2.87 lakh crore (2,870 billion) in 5 years to provide functional tap water connections to 2.86 crore (28.6 million) homes in 4,378 urban bodies. It is noteworthy that 71 lakh (7.1 million) people in arsenic-contaminated areas and 5.35 lakh (0.53 million) people in fluoride- contaminated areas were provided with safe drinking water (MoJS/PIB India 2020, 2021). JJM (Rural) is being implemented at a rapid pace with the states of Goa and Telangana already realising their targets, and 100% of rural households in these states provided with access to potable tap water (JJM 2021). Since these programmes are in their initial years of implementation, the progress will be apparent in the upcoming surveys.

VI. PROGRAMMES AND POLICIES IN THE SANITATION SECTOR

The SBM, with the two components: SBM-Grameen (SBM-G) and SBM-Urban (SWM-U), brought drastic changes in India's sanitation sector. The main objectives of the SBM

are the elimination of open defecation, eradication of manual scavenging, modern and scientific municipal solid waste management, behavioural change on healthy sanitation practices, awareness generation about sanitation and its linkage with public health, capacity augmentation of local bodies and creation of an enabling environment for public sector participation in capital expenditure and expenditure on O&M. The Mission provides flexibility to the state governments to adopt a state-specific implementation policy including utilisation of funds and mechanisms. During 2018–2019 budget, the Central Government announced a scheme in the sanitation sector, called Galvanising Organic Bio-Agro Resources Dhan (GOBAR-DHAN), with an aim to manage and convert cattle dung and solid waste in farms to compost biogas and bio-CNG. This scheme would supplement the objective of SBM-G for creating clean villages and is a key component of ODF plus (open defection þ) strategy of SBM-G. Evidently, SBM is the most important programme of the rural sanitation sector. The Central Government has framed policies and guidelines for sanitation, although the responsibility for the provision of sanitation facilities lies with Gram Panchayats. In many states, the empowerment of the Gram Panchayats has been inadequate, creating a governance gap in sanitation management. While the SBM-G Phase I is over, the Government of India reviewed its commitment to further enhance the status of sanitation and hygiene in rural areas, and introduced SBM-G Phase II, the main objectives being ODF sustainability, SLWM and visual cleanliness to be achieved through continued activities related to behavioural change and communication at all levels. Its guiding principle includes ensuring equity; prioritisation and financing of the community aspects for SLWM; utilisation of existing SLWM infrastructure whenever possible; promotion of SLWM activities related to reuse; convergence with other schemes; operation and maintenance to be obligatory in planning; flexibility to states; clustering of villages for the maximum economic efficiency; and prioritisation of villages on the banks of Ganga and the other water bodies (MoJS 2020a, SBM Grameen Phase II Guidelines, 2020). The Government has prepared a 10-year Rural Sanitation Strategy (2019–2029).

The National Health Policy (2000) emphasised the need for strengthening sanitation and other vital development indicators that directly contribute to public health. The Jawaharlal Nehru National Urban Renewal Mission (JNNURM) was launched in 2005 to provide basic services to the urban poor including water supply and sanitation. The 10th Five Year Plan (2002–2007) gave significant emphasis on water supply and sanitation. Thereafter, the first comprehensive National Urban Sanitation Policy (NUSP) was launched in 2008 with the aim to transform all urban areas into community-driven, totally sanitised healthy and liveable cities. The Nirmal Shahar Puraskar was introduced in 2010 for encouraging cities to move towards 100% access to sanitation facilities and 100% safe disposal of all of the city's waste. As mentioned earlier, the SBM-U launched in 2014 for creating ODF areas and achieving 100% scientific management of solid waste in all towns in the country. Since these programmes are in their initial years of implementation, the progress will be measurable in the upcoming Swachh Survekhan.

VII. CONTRIBUTION OF CURRENT POLICIES AND PROGRAMMES WITH SDG-6 AND OTHER

SDGs Several studies have highlighted considerable progress in SDG 6 in India (Roy & Pramanick 2019; WHO 2019; Hutton et al. 2020). While 93% of the population in the country have access to drinking water (UNICEF & WHO 2019), the progress in the provision of tap water to every household is expected to increase from 50% with the introduction and aggressive implementation of Har Ghar Jal programme of 2019. Similarly, the sanitation sector has witnessed tremendous improvement with the implementation of the SBM. While the proportion of global population using at least basic sanitation services increased from 59% in 2000 to 68% in 2015 (UN 2015), in India it increased from 70 to 93% (UNICEF & WHO 2019). The immediate output of these policies led to the increase in the number of water and sanitation facilities and the associated rise in the percentage of users of the same, which in turn has several associated socio-economic impacts. The water and sanitation-related policies have led to the achievement of 93% of households having access to drinking water and the same is increasing rapidly under the JJM. Thus, the universal coverage of safe drinking water to households is to be realized by the year 2024. The progress in 2 years of the programme covering 84.84 lakh (8.48 million) households in the year 2019–2020, 71 lakh (7.1 million) households in arsenic- contaminated areas and 5.35 lakh (0.53 million) in fluoride-contaminated areas (arsenic and fluoride being the cause of severe concern in several regions of the country) has huge relevance to public health and economic development. The country is all set to achieve SDG 6.1.1 by 2024. Similarly, the phenomenal improvement in sanitation in the country has enabled the achievement of 98% of households having access to toilets thus realizing SDG 6.2.2. The outcomes of these programmes have been discussed below.

VIII. IMPROVED HEALTH AND HYGIENE

The SBM has led to an increase in improved hygiene and

improved WASH practices. Having a strong public participation, 12% of the overall allocation for massive public awareness on sanitation (SBM) has led to nationwide public movement towards sanitation being the largest behavioural change programme in the world (Mohapatra 2019). In total, 3% of the allocation for mass media campaigns and communication activities through advanced technology, modern advanced communication strategies, national-level campaigns, involvement of schools in awareness, integration of WASH curriculum in schools and grassroots-level communication have led to the success of the program, but the sustainability of these sanitation interventions for long-term health benefits is vital (Curtis 2019; Sengupta et al. 2019; Coffey et al. 2020; Joshi 2021), which is expected to be addressed by SBM Phase II (SBM 2020).

Swachh Survekshan, the survey-based ranking, has also led to increased awareness and peoples' participation in urban areas moving towards improved hygiene and health (NIUA 2015). Improvement in health has also been highlighted in several studies (Gupta et al. 2019; Pathak & Chakravarty 2019; Raman & Muralidharan 2019; Gandhare et al. 2020). Improvement in health impacts has been studied through the reduction of diarrhoeal disease in children (Dandabathula et al. 2019) and associated reduction in mortality, reduction of stunting and underweight in children (Spears et al. 2013). A cost–benefits analysis of the SBM in India highlighted that 55% of the annual benefits were health-related, which included the savings in medical expenditure for medical treatment of diarrheal issues, time saved in illness and caretaking and reduction in premature deaths (Hutton et al. 2020).

Dandabathula et al. (2019) have correlated data on acute diarrhoeal disease and increased toilets in SBM to find a corresponding positive impact of SBM in reducing diarrhoeal disease. Similarly, studies have also established that the hygiene interventions adopted under SBM-G (SBM-Rural) are highly cost-beneficial to rural India mainly due to the health benefits that reach their full potential when the very high coverage and usage of safe sanitation is achieved in a community (Hutton et al. 2020). Benefits of water and sanitation on health through reduced health impacts, such as diarrheal diseases, stunting and other health impacts of poor sanitation leading to improved well-being, have been clearly established (Bartram & Cairncross 2010; OECD/WHO 2020). Hutton et al. (2020) have monetised the benefits of reduced healthcare costs, health-related productive time and mortality by accounting for the improvement in health (reduction in diarrheal diseases, stunting and other health impacts), time and convenience, external environment, property value, water for drinking and other uses, personal dignity, privacy and perceived social benefits. Their study estimates the total annual benefit of SBM- G as USD 727 above which the rise in property value was estimated as USD 294, 55% of the estimated benefits has been attributed to health-related benefits.

IX. ECONOMIC DEVELOPMENT

Several studies have established the positive correlation of improved water (WHO 2019) and sanitation on household income and poverty reduction (Bartram & Cairncross 2010; Mara et al. 2010; Van Minh & Nguyen-Viet, 2011). The positive impact of increasing per capita GDP and sanitation-related indicators thereby contributing towards SDG 1 – to end poverty – has been studied (Roy & Pramanick 2019). Hutton et al. (2020) have estimated the positive impact of water and sanitation on economic development. Their study shows the significant economic impact of improved sanitation and hygiene under the SBM and monetises the impact of ending open defecation universally, as a reduction of USD 64 billion to the nation's GDP.

India has largely been able to create an enabling environment in terms of universality, sustainability and equity of water and sanitation service delivery, as required by SDG Goal 6 Targets 6.1 and 6.2. While the earlier sections detail the Government of India's policies and programmes towards aligning the progress in the water and sanitation sectors, the current section discusses factors that contribute to an enabling environment. The analysis is based on the five key requisite elements recognised by Sanitation and Water for All (SWA) to deliver equitable and functioning Water Sanitation and Hygiene Services (SWA, 2016).

X. PROGRESS IN SDG 6 IN INDIA

In 2018, the SDG 6 Index Score based on five public level indicators caught three out of the eight SDG focuses for 2030. The Index Score for Clean Water and Sanitation varied between 31 and 100 for states and 45 and 100 for UTs. Among the States, Gujarat has accomplished a full score of 100. A similar score is shared by Chandigarh, Dadra and Nagar Haveli, and Lakshadeep. To measure India's progress towards Goal 6, the 2019 SDG Index Score identifies seven national-level indicators ranging from 69 to 96 for states and 61 to 100 for UTs. Andhra Pradesh and Chandigarh were remaining the top-performing states and union territories, respectively. Among the States and UTs (except Delhi), all scored higher than or equal to 65, putting them in the category of Front Runners. Chandigarh, with a score of 100, was in the category of Achiever. SDG Index Scores for Goal 6 in 2020 range from 54 to 100 for States and 61 to 100 for UTs using the same methodology as in

2019. The top performers among States and UTs were Goa and Lakshadweep, with 100 scores. Twenty-five States and six UTs grabbed a position in the category of Front Runners.

The SDG 6 index scores which was 63 in 2018, increased to 88 in 2019 and in 2020 it was 83. India is making good progress toward achieving SDG 6 outlined in the 2030 Agenda. With its holistic, universal, transformative approach, the 2030 agenda for SDGs will have a lasting impact on social, economic, and environmental issues around the world. As the UN urges the world to work together to end poverty, hunger, and other socioeconomic and environmental problems, developing nations will benefit from this agenda.

XI. CONCLUSION AND WAY FORWARD

By the localization of SDGs by states and local governments to support the achievement of the SDGs through bottom-up actions, SDGs provide a framework for the local development policies (NITI Aayog 2019). Evidently, the states and UTs are the primary players and contributors in ensuring the success of the SDGs in India. Considerable efforts have been made by many of the Indian states in spearheading to achieve the SDG water and sanitation targets. Some of the states are making progress towards aligning it with other SDGs at the state and local administrative levels. This synergy among the various stakeholders, including state, district and city governments, academia, private sector and CSOs under programmes such as the SBM, JJM and AMRUT, should be strengthened for achieving better WASH outcomes and SDG targets.

Given the socio-economic dynamics in India, achieving SDG 6 as well as the other SDGs will require imaginative management of trade-offs in a complex operating environment. The policies and programmes in the water and sanitation sectors in India should build upon the efforts made so far. Along with a strong regulatory mechanism, there needs to be a stronger enforcement mechanism and stricter implementation of policies, such as the NWP, FSSM policy and Solid Waste Management Rule, for better QoL outcomes such as reduction in poverty, better health and education. Water and sanitation missions cannot predominantly be a Central Government programme with construction targets. State-level annual reports in legislatures can ensure better scrutiny and accountability of initiatives.

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