



Sustainable Sanitation of Villages on Bank of River Ganga in Uttar Pradesh

Dr. Ranveer Kumar Singh

Department of Sociology, Santosh Smarak Mahavidyalaya, Dodrajpur, Nagina, Bijnor, India

Author Email: drranveer01@gmail.com

Abstract—Individual health and hygiene is highly dependent on appropriate availability of drinking water and proper sanitation. There is, therefore, a clear relationship among water, sanitation and health. Consumption of hazardous drinking water, inappropriate disposal of human excreta, improper environmental sanitation and lack of personal and food hygiene have been important causes of many diseases in underdeveloped countries. India is no exception to this. Prevailing high infant mortality rate is also primarily attributed to poor sanitation. Government has introduced Swachh Bharat Mission (Gramin) to improve the sanitary conditions and eradication of open defecation. Besides government-initiated standards, protocols and regulations for monitoring the sanitation conditions and creating inclusive and sustainable sanitation infrastructure such as individual household toilets, community toilets complexes besides ensuring zero disposal of wastes including solid wastes, liquid wastes and plastic wastes into Ganga River under Namami Gange Mission. Present paper attempts to review the sustainability of rural sanitation in Uttar Pradesh, particularly in the villages situated on the bank of river Ganga. The paper is based on secondary data and pertinent literature.

Keywords: Rural Sanitation, Swachh Bharat Mission (Gramin), Sustainable Development, Ganga River Villages

I. INTRODUCTION

Water, sanitation, and health are linked. In developing countries, unsafe drinking water, improper excreta disposal, poor environmental sanitation, and lack of personal and food hygiene cause many diseases. This includes India. Poor sanitation also contributes to high infant mortality. Earlier, sanitation consisted of cesspools, open ditches, pit latrines, bucket systems, etc. Today, it refers to waste disposal, food hygiene, personal, domestic, and environmental hygiene. Proper sanitation is important for both our personal and social health. Sanitation is access to and use of excreta and waste water facilities and services that ensure privacy and dignity for all. Facilities and services should include excreta collection, transport, treatment, disposal, and hygiene promotion. Sanitation affects quality of life and the HDI. Good hygiene prevents water and soil contamination and diseases. Sanitation includes personal hygiene, home sanitation, safe water, garbage disposal, excreta disposal, and waste water disposal. In India, sanitation has been neglected for most of the post-independence era. Millions of Indians suffer from grave ill health, increasing safety threats, lower spending on education and nutrition, reduced productivity, and lower income earning potential due to a lack of sanitation facilities (Dasra, 2012). Sanitation has many meanings. Sanitation involves safely managing excreta and wastewater. It includes both 'hardware' (latrines and sewers) and 'software' (regulation, hygiene promotion) to reduce faecal-oral disease transmission. It includes reuse, excreta disposal, and wastewater discharge. Sanitation involves safe waste handling. Safe handling means safe collection, storage, treatment, and disposal of all waste. Excreta, household waste water, sewerage, effluents, industrial waste, etc. are all sources of waste (Bisaria, 2015). Sanitation refers to public health measures. It also refers to safe conditions such as clean water, safe air, safe animal, human, and industrial waste disposal, and protection of food from biological and chemical contamination, and safe housing (Pais, 20015). WHO defines sanitation as the safe disposal of urine and faeces. Inadequate sanitation is a major cause of disease worldwide, and improving sanitation improves household and community health. UNICEF defines sanitation as improving and protecting health and well-being. Indians have complex ideas of purity and excreta. Cow dung is used for manure, dung cake for fuel, and cleaning kacha

floors. Human excreta are a major cause of pathogen disease spread, but treated and converted excreta are used as crop compost. Open defecation is the social norm in many communities. It is often argued that people prefer open fields and feel claustrophobic in enclosed areas, so even when toilets are built, men prefer to go out to the field. Lack of household toilets affects women and children greatly. After dark, women defecating in open fields risk harassment, teasing, lewd remarks, and sexual assault (Bisaria, 2015). Tilley et al. (2013) provided a comprehensive review of literature on gender and sanitation in low-income and developing countries, arguing that 'strategies to make technologies gender-responsive need to be based on a thorough analysis of the social arrangements of the intimate, and how these are negotiated and institutionalised in a specific context' Burt et al. (2016) reviewed existing literature for UN Women to show how inadequate access to sanitation prevents people from realising their human rights to water, sanitation, and gender equality. Pearson & McPhedran (2008) reviewed published and grey literature on non-health impacts of sanitation and found a lot of repetition of data, especially on girls' school attendance and toilet facilities. Authors should consider their sources of evidence and who they are targeting. Without proper sanitation, women and girls must 'discipline their bodies or face public shame, humiliation, and embarrassment' (Truelove, 2011).

II. SUSTAINABLE RURAL SANITATION

Sustainable sanitation is related with creation and maintenance of sanitation infrastructure and delivery of sanitation services on regular basis and ensuring the conditions of Open defecation free communities. Definitions for assessing ODF communities vary, but often it include (1) eradication of open defecation in the community; (2) hygienic household toilets that contain faces, offer privacy, and have a lid on the defecation hole and a roof; (3) use of sanitation by all household members and all in the community; and (4) a hand washing facility nearby with water, soap or ash, and evidence of regular use. Some countries include additional elements or a second stage (sometimes called ODF +), such as hand washing, safe and protected drinking water storage and handling, food hygiene (elevated dish drying racks, food covering), grey water disposal, solid waste management, and (6) provides school, market, and pedestrian latrines. Institutions and processes, including political priority and campaigns; programme quality, inclusiveness, and intensity; and post-ODF follow up. Physical and technical sustainability: conditions, structures, sanitation ladder, market, and sanitation services. Social, behavioural sustainability: change in social and behavioural norms, motivations and preferences for OD, and community and cultural dynamics, including equity, inclusion, and meeting people's needs.

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confidently request services and support to manage menstruation, postpartum bleeding, fibroids, and other abnormal uterine bleeding at home, school, and work. This includes safe spaces for changing, washing, using the right materials, safe disposal, pain medication, and counselling. Sanitation, cleanliness, and hygiene are key SDGs. Better sanitation, hygiene, and cleanliness reduces vector-borne diseases, parasite infections, and nutritional deficiencies. Cleanliness and hygiene reduce gastrointestinal diseases (especially diarrhoea), psychological issues, and allergic conditions (Mishra, 2020).

The 2015 Sustainable Development Goals (SDGs) have changed sanitation management. Targets 6.2 (safely managed sanitation and hygiene services) and 6.3 (reducing untreated wastewater) focus on managing the entire sanitation chain, including containment, emptying, transport, treatment, and safe reuse or disposal. This has major implications for urban areas, which are major contributors of untreated wastewater, creating environmental degradation and public health hazards (both within and outside cities) impairing social and economic productivity. National water, sanitation, and hygiene (WASH) targets increasingly reflect SDG ambitions, aiming for universal coverage and higher service levels. However, this is difficult in urban contexts. Recent Joint Monitoring Program (JMP) and Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS) reports highlight uneven progress in sanitation coverage, with the urban poor un-served. Citywide inclusive sanitation provides equitable services for all urban residents. While the exact definition of City wide inclusive sanitation is still evolving, the 2016 guiding principles have gained traction with development partners, governments, and service providers in many countries. Prioritize the human right of citizens to sanitation—equitable and accessible for all; (ii) Deliver safe management along the whole sanitation service chain, from the toilet to safe treatment and reuse; (iii) Integrate sanitation in urban planning and renewal, providing liveable and sanitary environments; and (iv) Commit to working in partnership to deliver citywide inclusive sanitation, including formal and informal partners. CWIS is still an evolving framework for urban sanitation investment programming, but it has already shaped programming and investments from development banks and major sector actors. Sanitation, cleanliness, and hygiene are key SDGs. Better sanitation, hygiene, and cleanliness reduces vector-borne diseases, parasite infections, and nutritional deficiencies. Cleanliness and hygiene reduce gastrointestinal diseases (especially diarrhoea), psychological issues, and allergic conditions.

III. PERFORMANCE OF SBM

Swachh Bharat Mission (Grameen) programme, which is the government of India's flagship initiative, reached a significant milestone when 101462 villages declared themselves to be ODF Plus. The ODF status of these communities of villages is being maintained, and they have systems in place for managing solid and/or liquid waste. These villages plan to continue their journey towards better sanitation as they work for making their villages cleaner, greener, and healthier. As a way to pay honour to Mahatma Gandhi on the occasion of the 150th anniversary of his birth, the Honourable Prime Minister Shri Narendra Modi Ji initiated the Swachh Bharat Mission over eight years ago with the goal of eliminating the practise of open defecation throughout the country. Rural India was declared free of open defecation on October 2, 2019, 11 years ahead of the SDG-6 target that was set by the United Nations. This accomplishment was made possible by his visionary leadership, which inspired the entire nation to join forces in the largest behaviour change campaign in the history of the world. But this was not the end of the mission; rather, it established the groundwork for a far more difficult but vital duty; the necessity to secure perfect cleanliness in order to make the country's villages ODF Plus. Given that the process of managing solid and liquid waste is technical in nature, is relatively new to rural India, and is a second-generation issue, achieving one lakh ODF Plus villages is no small achievement. The provision of toilets has resulted in the requirement of faecal waste management. Additionally, as more potable water is supplied, more grey water is produced, which then needs to be cleaned and reused; and as lifestyle changes and the usage of packaged food goods raise the spectre of plastic trash in rural areas, it is imperative that this problem be efficiently controlled. This is exactly what the second phase of the Swachh Bharat Mission, is all about: the appropriate management of all types of waste, which will not only make our villages clean, but will also create avenues for generating incomes for rural households and create new opportunities for rural people to make a living, all while meeting the requirements of the Sustainable Development Goals. The SBM-G serves to reaffirm the government's dedication to enhancing the quality of



life of its residents by fostering better hygiene practises and more secure sanitation facilities. Given that not all villages may fulfil all criteria under the verticals of biodegradable waste management (BWM), plastic waste management (PWM), grey water management (GWM), and faecal sludge management (FSM) before declaring a village as ODF Plus, DDWS had initially introduced intermediate stages in the process of declaring a village as ODF Plus. This was done because it was possible that not all villages would fulfil all of the criteria before declaring a village as ODF Plus. There are currently 54734 villages that fall into the ODF Plus – Aspiring category; these are the villages in which all households and institutions, in addition to having access to sanitation through individual household latrines, have arrangements for either SWM or LWM. There are 17121 villages that fall into the ODF Plus – Rising category; these are the villages in which residents have arrangements for both LWM and SWM, in addition to meeting the criteria for the ODF Plus – Aspiring category. Those 29607 communities have been designated as ODF Plus - Model because they possess all of the aforementioned characteristics and because IEC messages are extensively exhibited and disseminated there. This also equates to 99640 villages across the country having provisions for the management of solid waste, 78937 villages having facilities for the management of liquid waste, and around 57312 villages having both working solid and liquid waste management plants in their communities. Telangana, Tamil Nadu, Odisha, Uttar Pradesh, and Himachal Pradesh are the top five performing states in terms of the number of villages that have been proclaimed ODF Plus. The other state that made the list was Himachal Pradesh. Because the process of managing solid and liquid waste is both technically complex and relatively novel in India's rural areas, the government is providing the states with as much aid as it can in the form of finance, technical assistance, and support for the development of capacity. Community engagement is essential to the success of the campaign, just as it was in Phase I of SBM (G), because it creates the way for self-development and contribution, which is and will continue to be the defining characteristic of the campaign. The campaign reaffirms the government's dedication to improving the quality of life of its residents and achieving our dream of a Samporn, Swachh, and Swasth Bharat by 2024–2025.

The state of Uttar Pradesh, which has around 200 million inhabitants and is the most populous in India, has historically not fared well in terms of sanitation. According to data collected during the 2001 and 2011 censuses, the number of people living in rural areas of Uttar Pradesh who had access to a flush toilet rose marginally over the first decade of this century. However, due to the fact that the population increased at the same time, there were 13 million more persons found to be defecating in the open in the year 2011. Poverty, the lack of a comprehensive sanitation strategy, and a lack of concentration and dedication on the part of decision-makers are some of the factors that have slowed down the state's development on sanitation. Recent events, on the other hand, provide the impression that things are shifting. It is more likely that women will use the restroom. In point of fact, despite having access to a bathroom, men are twice as likely to defecate in public as women. However, it is unmistakable that people's behaviours are shifting. Combining the limited technical support available at the district level with the construction of institutional capacity at the state level appears to be the solution, riding a wave of growing political will and a strong commitment by the local administration. The Swachh Bharat Mission (SBM) Phase 2 will be implemented in Uttar Pradesh during the financial year 2022-2023, and the state's budget for that year has been authorised by the central government at Rs. 2,548 crore. In addition to the 2.18 crore toilets that were constructed during the first phase of the mission, the State government has so far constructed 58,059 community toilets as part of phase 2 of the mission, which began in the year 2020. These toilets were primarily intended for SC/ST communities as well as migrant workers. All of the restrooms are kept clean by the female members of SHGs, which are eligible to receive a stipend from the government in the amount of 9,000 rupees per month to maintain the cleanliness of each panchayat's restrooms. The Panchayati Raj Department has also devised a strategy to achieve an ODF++ grade for 4,723 villages by the end of the fiscal year 2022-23. This strategy involves the participation of the local community in the management and disposal of solid and liquid waste. In addition, the government has already built 8.70 lakh toilets for newly formed families and migrant workers, and they are currently in the process of building thousands more after receiving requests in this respect through the portal. A total of 940 individuals, including Divisional Deputy Directors, Panchayat Officials, District Officials, Masons, and Sanitation Workers, have received training from the government in order to improve their ability to effectively manage sewage networks in rural areas. In addition to finishing the



Gobar Dhan-18 project and achieving grade ODF+ in 7,656 villages, the Department was also responsible for the construction of 24,394 community compost pits and 67,640 community drier pits. In the past five and a half years, Uttar Pradesh has constructed the biggest number of toilets and is also working relentlessly to have a sustainable system for the maintenance of these toilets along with an effective waste management system for faeces, liquid, and solid waste. According to a spokeswoman for the Panchayati Raj department, Uttar Pradesh is now making preparations to reach the ODF++ category for its villages by the year 2025, which is part of the second phase of the Swachh Bharat Mission (Rural). While the ODF++ protocol adds the condition that faecal sludge/septage and sewage be safely managed and treated, and that there be no discharging and/or dumping of untreated faecal sludge/septage and sewage in drains, water bodies, or open areas, the ODF protocol does not add the condition that faecal sludge/septage and sewage be safely managed and treated. The state government is making every effort to transform the countryside of the state in terms of cleanliness and a clean environment within the next four years, according to a spokesperson for the government. This includes constructing personal and community toilets, having a system in place for their regular maintenance, providing sound sludge management and sewage network, ensuring safe disposal of faecal, solid, and liquid waste, and maintaining regular water supply. According to the spokeswoman, because the Mission is so extensive, the government is also looking for the cooperation of the community. The age-old tradition of defecating in public is something that needs to be relegated to the annals of history so that a new chapter can be written in the development of the state's villages. Namami Gange Programme is an Integrated Conservation Mission that was approved by the Union Government in June 2014 as the 'Flagship Programme' with a budget outlay of Rs.20,000 Crore to accomplish the twin objectives of effective abatement of pollution, conservation, and rejuvenation of National River Ganga. The Union Government approved Namami Gange Programme as the 'Flagship Programme'. The Ganga Mission has been carried out throughout the Ganga River Basin and its tributaries in the states of Uttarakhand, Uttar Pradesh, Bihar, and Jharkhand, as well as in West Bengal. The state of Uttarakhand is home to 7 districts that are situated along the Ganga river, whereas the state of Uttar Pradesh is home to 25 districts that are situated along the Ganga river. There are twelve districts in the state of Bihar that are discovered placed on the bank of the river Ganga. The states of Jharkhand and West Bengal each have one district that is found situated on the bank of the river Ganga. In the state of Uttar Pradesh, Prayagraj, Balia, Bijnore, Badaun, Chandauli, Farrukhabad, Bulandshahar, Fatehpur, Ghazipur, Hapur, Hardoi, Jyotiba Phule Nagar, Kannauj, Kanpur, Unnao, Kashi Ram Nagar, Kaushambi, Meerut, Pratapgarh, Rai Bareilly, Sant Ravi Das Nagar, Shahjahanpur, Sambhal, and Varanasi districts are situated on the bank of river Ganga. The Ministry of Drinking Water and Sanitation (MoDWS) counted a total of 1,674 Gram Panchayats in five different states that are located along the Ganga riverbank (Uttarakhand, Uttar Pradesh, Bihar, Jharkhand, West Bengal). The Ministry of Drinking Water and Sanitation (MoDWS) has been given 578 crores of rupees, which will be used to build toilets in 1674 village panchayats across the five states that make up the Ganga Basin. The Ministry of Housing and Urban Development has succeeded in constructing 8, 53,397 bathrooms out of a total goal of 15, 27,105 units. A consortium of seven IITs has been working on the compilation of the Ganga River basin Plan, and thirteen IITs have taken an interest in the development of 65 villages as potential model villages. At a cost of approximately Rs. 127 Crore, the United Nations Development Programme (UNDP) has been tasked with carrying out the rural sanitation initiative and transforming Jharkhand into a model state. The National Mission for Clean Ganga is an initiative that aims to revitalise the Ganges River by utilising the most advanced knowledge and resources available from around the world. The prospect of a clean Ganga has long been appealing to a wide range of nations throughout the world that have experience rehabilitating rivers. In the states of Uttarakhand, Uttar Pradesh, Bihar, Jharkhand, West Bengal, Delhi, Himachal Pradesh, Haryana, and Rajasthan, there are around 54 sewage management projects that are now being implemented, and there have been 92 sewage projects that have been completed. In these states, there are now 8 sewage projects up for bid, in addition to 7 sewage projects that have just been started. The building of a sewerage capacity of 5015.26 cubic feet per second is now under way (MLD). There have been around 67 Ghats/Crematoria projects that have been launched. These projects are for the building, remodelling, and renovation of 265 Ghats/Crematoria and Kunds/Ponds. Under the 'Namami Gange' project, all 4,480 villages that are located along the banks of the Ganga River have been proclaimed to be open defecation free (ODF). The four thousand four hundred and eighty ODF villages are spread over the states of Uttarakhand, Uttar Pradesh, Bihar, and Jharkhand, as well as West Bengal.

IV. CONCLUSION

Sanitation is essential to human growth and civilization. Lack of Sanitation raises the risk of water-borne diseases. Sanitation must be inclusive and sustainable. Lack of a sewage network, inadequate wastewater treatment plant performance, and poor sanitation service delivery in contribute to poor sanitation. Unsafe water, poor sanitation, and poor personal and nutritional hygiene spread disease. Sanitation includes waste management, food, personal, and environmental hygiene. Human excreta and waste water are handled respectfully, providing a clean and healthy living environment. Sanitation infrastructure should include sewage and waste management. Government of India under Swachh Bharat Mission (Rural), has achieved remarkable progress in development of inclusive sanitation infrastructure and institutional building for its maintenance besides declaring ODF in all villages on the bank of river Ganga. The efforts have been made to ensure security of women , control of water and victor borne diseases , improving quality of river water through zero discharge of waste water into river bodies , reducing and recycling of plastic wastes flowing into river as well as improving quality of soil through increasing use of bio fertilizers in the villages situated on the bank of river Ganga. It is imperative to study the sustainability of rural sanitation, status of ODF, current practices of septage and faecal sludge including waste water management, solid and liquid waste disposal practices etc.

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