

# Gender Mainstreaming in Urban Sanitation: A Study of Selected Cities in Uttar Pradesh

*Dr. A. K. Singh<sup>1</sup> and Dr. S. P. Singh<sup>2</sup>*

## **ABSTRACT**

*Sanitation in India is a State subject. State-level steering committees and urban departments play the role of guidance and support to Urban Local Bodies which are responsible for final implementation of sanitation at the local level. ULBs are mandated to undertake planning, design, implementation, operation and maintenance of water supply and sanitation services in cities and towns. At the central level, the nodal Ministry of Housing and Urban Affairs is tasked with supporting implementation of the National Urban Sanitation Policy on various fronts including designing and implementing national-level strategies on linkages between public health and sanitation, clarifying institutional roles, capacity-building and training support to states and ULBs, providing financial assistance for City Sanitation Plans through existing government schemes, monitoring and evaluating projects, and mainstreaming sanitation into relevant programs on urban infrastructure and housing across various central ministries. Besides the Ministry of Housing and Urban Affairs, institutional responsibility for the full water supply and sanitation chain at the ministerial level falls between a number of ministries, commissions, and boards. This complexity also contributes at times to the failure to implement programs in the sector. There is a direct relationship between water, sanitation and health. Consumption of unsafe drinking water, improper disposal of human excreta, improper environmental sanitation and lack of personal and food hygiene have been major causes of many diseases in developing countries. India is no exception to this. Prevailing high infant mortality rate is also largely attributed to poor sanitation. The concept of sanitation was earlier limited to disposal of human excreta by cesspools, open ditches, pit latrines, bucket system etc. Today, it connotes a comprehensive concept, which includes liquid and solid waste disposal, food hygiene, and personal, domestic as well as environmental hygiene. Present paper highlights the urban sanitation and imperatives of gender mainstreaming. The paper is based on mainly primary data collected through field survey in AMRUT cities of Banda, Bahraich, Mirzapur and Loni in Uttar Pradesh.*

## **Introduction**

Proper sanitation is important not only from the general health point of view but it has a vital role to play in our individual and social life too. Sanitation

<sup>1</sup> Assistant Director, Regional Centre for Urban and Environmental Studies, Lucknow

<sup>2</sup> Assistant Prof., Indian Institute of Forest Management, Bhopal, Madhya Pradesh

is access to, and use of, excreta and waste water facilities and services that ensure privacy and dignity, ensuring a clean and healthy living environment for all. Facilities and services should include the collection, transport, treatment and disposal of human excreta, domestic wastewater and solid waste, and associated hygiene promotion (UN Habitat and Water Aid). Sanitation is one of the basic determinants of quality of life and human development index. Good sanitary practices prevent contamination of water and soil and thereby prevent diseases. The concept of sanitation was, therefore, expanded to include personal hygiene, home sanitation, safe water, garbage disposal, excreta disposal and waste water disposal. Provision of basic services such as water supply, sewerage, sanitation, solid waste disposal and street lighting has traditionally been the responsibility of the local governments. These services are being provided through state government departments, state level boards, corporations etc. Public Health Engineering Department, Public Works Department, Urban Development Department, Housing Boards, Department of Local Self Government, Water Supply and Sewerage Boards etc. are some of the departments of the state government which performs municipal functions. With the passing of 74th Constitutional Amendment Act, Metropolitan Planning Committee and District Planning Committee have been formed to take up developmental activities in the concerned region in place of the parastatals. The ULB's have also been empowered to take up development functions. States have responded in diverse manner with regard to the status of parastatal agencies in the post decentralized period. Many state governments like Kerala and Karnataka have recommended the abolition of the parastatals while some have recommended for a change in their functional role like in Tamil Nadu, Uttar Pradesh, Maharashtra, West Bengal and Andhra Pradesh. The parastatal agencies have also been merged with Urban Development Department. The 74th Constitutional Amendment Act has also transferred administrative and financial process and created an enabling environment for the local bodies to undertake planning and development responsibility.

Universal access of urban sanitation to poor families is major challenge as slums and backward areas have grossly inadequate sanitation infrastructure and sanitation services as compared to the urban areas. This is because of the fact that development work was carried out in only recognized/notified slums areas by the local bodies. However, In 2005 Govt. of India under the JNNURM Mission highlighted that all existing slums are to be integrated in the mainstream of urban planning and development. Thus, with the construction of community and public toilets in the states like Maharashtra, Karnataka, Madhya Pradesh, Gujarat and Orissa accessibility of sanitation services has been increased to the urban poor. Providing environmentally safe sanitation to the people of world's second most populous nation is a challenging task. The challenges that urban sanitation sector faces mainly relate to the low priority

accorded to it by the municipal governments. This task becomes more intricate in context to the country like India where introduction of new paradigms of plans, policies or projects can challenge people's tradition and belief. Around 600 million people constituting 55 per cent of country's population do not have access to safe sanitation or any kind of toilet. Open defecation is a large global problem, but it is substantially and importantly an Indian problem. About 60 per cent of the approximately 1 billion people worldwide who defecate openly live in India. Widespread open defecation has major consequences for health and human capital in India. Inadequate sanitation has a great environmental economic and health impacts in India. In order to minimize these impacts, Government of India has under taken several measures including increased investment in urban sanitation, policy initiatives, regulations, and public campaigns to improve sanitary conditions in the country. This has resulted in raising the sanitation status during the last two decades but a marked improvement is yet to be achieved.

Presently fund is available under AMRUT, Swachh Bharat Mission, Namami Gange and 14<sup>th</sup> Finance Commission for sanitation in urban centres in India. However, septage and faecal sludge management is covered under AMRUT. Sewerage connection is also been ensured under AMRUT and Namami Gange. There has been paradigm shift in urban governance in India in the recent years. The emphasis from schemes and programmes has been shifted to mission mode approach for achieving the targets and project objectives. Massive investment based programmes and schemes in mission mode approach have been implemented recently by the Ministry of Urban Development as Ministry of Housing and Urban Poverty Alleviation, Government of India. The focus of government is on development of urban infrastructure, improvement in delivery of civic services through public private partnership, implementation of reforms and improving service delivery mechanism. The government is also planning to create high quality urban infrastructure and providing smart solutions in civic services through effective use of technology and mobilizing private sectors for investment in selected cities of India. There has been larger focus on improving the sanitary conditions and eradication of open defecation in urban areas through social mobilization and construction of toilets. These schemes and programmes are expected to yield good results in the coming years. As JNNURM and subsidiary schemes has already resulted in construction of urban infrastructure and improvement in urban governance through implementation of urban reforms. The second generation of JNNURM in name of AMRUT is also focusing on urban reforms for service delivery besides creation of infrastructure.

There are many possible definitions of sanitation. Sanitation means the safe management of human excreta and wastewater. It therefore includes

both the 'hardware' (e.g. latrines and sewers) and the 'software' (regulation, hygiene promotion) needed to reduce faecal-oral disease transmission. It encompasses potential reuse, ultimate disposal of human excreta or discharge of wastewater. Environmental sanitation aims at improving the quality of life of the individuals and at contributing to social development. This includes disposal or hygienic management of liquid and solid human waste, control of disease vectors and provision of washing facilities for personal and domestic hygiene. Environmental sanitation comprises both behavior and facilities to form a hygienic environment. Most diseases associated with water supply and sanitation, such as diarrhoea, are spread by pathogens found in human excreta. The faecal-oral mechanism, in which some of the faeces of an infected individual are transmitted to the mouth of a new host through one of a variety of routes, is by far the most significant transmission mechanism. This mechanism works through a variety of routes. Primary interventions with the greatest impact on health often relate to the management of faeces at the household level. This is because (a) a large percentage of hygiene-related activity takes place in or close to the home and (b) first steps to improving hygienic practices is often easiest to implement at the household level. Secondary barriers are hygiene practices preventing faecal pathogens, which have entered the environment via stools or on hands, from multiplying and reaching new hosts. Secondary barriers thus include washing hands before preparing food or eating, and preparing, cooking, storing, and re-heating food in such a way as to avoid pathogen survival and multiplication. The water supply and sanitation provide the necessary barrier between the pollutants, natural - built environment and humans.

The findings of the Census of India 2011 indicate that only 32.7 per cent of urban households are connected to a piped sewer system whereas 38.2 per cent dispose their wastes into septic tanks and about 7 per cent into pit latrines, underlining the predominance of onsite arrangements—and it is not clear how the waste is further disposed by the majority of these installations. Presently, septic tanks and pit latrines along with open defecation are major contributors to groundwater and surface water pollution in many cities in the country. One the major challenges in urban sanitation is the collection, treatment and disposal or reuse of Faecal Sludge. Adequate facilities and services for collection, transportation, treatment and disposal of faecal sludge do not exist in most Indian cities and towns. Faecal Sludge comprises varying concentrations of settleable or settled solids as well as other non-faecal matter that is collected from on-site sanitation systems, such as latrines, non-sewered public toilets, septic tanks and aqua privies. Faecal sludge from septic tanks is specifically termed as septage. FSM should be given priority in urban sanitation programmes and there should be an increased convergence between AMRUT and SBM goals of making India ODF. Achieving ODF should not merely be restricted to the act of going for open defecation but the faecal matter should

also be properly disposed to reduce its ill effects. Separate faecal sludge disposal station needs to be constructed such as SWM plants. Need to ensure that there is a reliable fee-based service for FSM at the ULB level by incorporating this requirement as a precondition for funding under SBM. The scheme should strongly incentivize the development of local service providers based on PPP models and encourage resource recovery. Skill development of personnel on plumbing, mechanical desludging of septic tanks/ pits, truck operation with immediate job placement is required (Singh et. al,2017).

According to the type of toilet facility in India (Census of India, 2011), around 81 per cent of urban households have access to toilet facilities within the household premises, 6 per cent access public toilets, and 12 per cent are forced to resort to open defecation. Thus, nearly 10 million households still defecate in the open. Open defecation, and the lack of access to any kind of toilet facilities, individual or shared, is one of the biggest concerns and challenges for urban sanitation in India. Studies also indicate that the condition and type of toilets in urban areas is highly variable. Toilets, especially among poorer communities, are often dysfunctional: clogged toilets, leaking taps, broken floors or roofs (WSP-TARU, 2008). Access to improved sanitation has increased over the past two decades (from 49 per cent in 1990 to 77 per cent in 2011). While the percentage of households without access to 'basic sanitation' has decreased from 32 per cent to 17 per cent over the corresponding period, the number of households practising open defecation or having unimproved toilets, has reduced from 72 million to 64 million.

Broadly, the sanitation systems in India can be divided into two broad types: network-based systems, which refer to piped sewerage and on-site systems which includes all other categories. It is evident that only a third of the city population is serviced by network-based systems, as apart from piped sewerage, all other categories constitute on-site systems. In a survey carried out in 300 cities, only 100 cities had sewerage systems (NIUA, 2005). The number of cities with sewerage has increased slightly, according to Census 2011. Even now, only 792 or only 10 per cent of cities have more than 50 per cent of households connected to sewerage systems, and it is in all likelihood an overestimate. The various estimates indicate that only one-third of total wastewater generated is collected (CPCB, 2009). In the national sanitation ratings carried out for 423 cities, 274 cities (65 per cent) have unsatisfactory arrangements for safe collection of human excreta. Only about 27 per cent of cities are collecting more than 80 per cent of their waste (MoUD, 2010). The sewerage systems, where they exist, are plagued by multiple problems. The sewers in most Indian cities are badly maintained: frequent blockages, siltation, missing manhole covers, gulley pits. There is hardly any preventive maintenance with repairs being made only in the case of crises (WSP-TARU, 2008). Improper disposal of

solid waste also tends to block sewer lines. Sometimes, storm water enters the sewerage network, leading to inflow in excess of the capacity of the system, and hence sewer lines cannot function. (Wankhade et. al, 2014) .

The sanitation systems are often only considered partially. The on-site based sanitation solutions (latrine or septic tank-based) frequently do not include excreta and faecal sludge emptying, transport or treatment services and facilities. Additionally, local business opportunities, as well as demand and potential use of waste resources, such as water, nitrogen or bio- solids, are given little attention. Failures or unsustainable solutions put huge financial burden on municipalities. In cities of developing countries, large amounts of excreta and faecal sludge collect in on-site sanitation facilities, such as private or public latrines, and septic tanks. As opposed to industrialised countries, where excreta is disposed of via cistern-water flush toilets, city-wide sewerage systems and central wastewater treatment plants, all of which are widespread technologies in industrialised countries but unaffordable or inappropriate in developing countries. If faecal sludge is collected at all from on-site sanitation technologies, they are most often disposed of in an uncontrolled manner without prior treatment, thus, posing severe health risks and polluting the environment ( SCBP,2017).

Various technologies which perform the same or similar type of function are called as functional groups. When different technologies from different functional groups are clubbed together, a sanitation system is made. Careful selection of the technologies needs to be done to make the sanitation system functional. A sanitation system should consider all the products generated and all the functional groups these products are subjected to prior to being suitably dispose of. Domestic products mainly run through five different functional groups, which form together a system. All sanitation systems start with User Interface. From this the product either goes to collection and storage/treatment group or to conveyance. This mainly depends on whether there is adequate supply of water available for water based system. After conveyance the products flow in the centralised treatment function group, where the products are treated before moving on to use/disposal group. The product though collection and storage/treatment also end up into use/dsposal functional group. Depending on the system, not every functional group is required. User interface describes the type of toilet, pedestal, pan or urinal the user comes in contact with. User interface also determines the final composition of the product, as it is the place where water is introduced in the system. Thus, the choice of user interface is often dependent on the availability of water. Selection of user interface depends on the following six technical and physical criteria : (1) availability of space (2) ground condition (3) groundwater level and contamination (4) water availability and (5) climate (IWA, 2014) .

The technologies which are used for the collection and storage of the products generated at the user interface. In the case of extended storage, some treatment may be provided, though it is generally minimal and dependent on storage time. All the units have to be either connected to conveyance or use/disposal function group for liquid effluent and to conveyance to solids. All the units need to be emptied regularly (depending on the design criteria) for solids. These solids in turn need to be treated or processed before use/disposal. The technical and physical criteria for choosing appropriate collection, storage and treatment technology are as follows: (1.) ground condition (2) groundwater level and contamination and (3.) climate. Conveyance describes the way in which products are moved from one process to another. Although products may need to be moved in various ways to reach the required process, the longest and most important gap lies between on-site storage and (semi-) centralised treatment. For the sake of simplicity, conveyance is thus limited to moving products at this point. The technical and physical criteria for choosing appropriate conveyance technology/system are as follows (1) water availability (2.) ground condition (3) ground water level and contamination.

Human-powered emptying and transport refers to the different ways in which people can manually empty and/or transport sludge and solid products generated in on-site sanitation facilities. It can be done by using buckets and shovels, or by manually operated pumps specially designed for faecal sludge. The advantages of manual emptying include the generation of income, low costs and the availability of tools, little or no requirement of electric energy. The large disadvantage that inheres manual emptying is the high health risk. Motorized emptying and transport refers to a vehicle equipped with a motorized pump and a storage tank for emptying and transporting faecal sludge septage and urine. Humans are required to operate the pump and maneuver the hose, but sludge is not manually lifted or transported. Motorised emptying and transport, is fast and generally efficient. Moreover, it can generate local jobs. But large streets are required for the trucks to pass, thick or dried material cannot be pumped and garbage in pits may block the hose. Moreover, capital costs are high and spare parts may be not available locally.

Sludge and septage emptied from on-site sanitation systems need to be transferred to (semi-) centralized infrastructures for further treatment. Transfer stations or underground holding tanks act as intermediate dumping points for faecal sludge and septage when it cannot be easily transported to a (Semi-) Centralized Treatment facility. A vacuum truck is required to empty transfer stations when they are full. Sewer discharge stations are similar to transfer stations, but instead of simply being a holding tank, the stations are directly connected to the sewer transporting the sludge to a (semi-) centralized treatment facility. Transfer stations reduce transport distance,

may encourage more community-level emptying solutions and prevent illegal dumping. The moderate capital costs may be offset with access permits and the construction and maintenance can create local income. However, expert design and construction supervision are necessary. The technical and physical criteria for choosing appropriate technology for treatment are as follows: (1) climate (2) availability of space (3.) ground condition (4) ground water level and contamination.

Use or disposal refers to the ways in which products are ultimately returned to the soil, either as harmless substances or useful resources. Furthermore, products can also be re-introduced into the system as new products. A typical example is the use of partially treated grey water used for toilet flushing. The conventional, centralized wastewater management concept, consisting of a water-borne wastewater collection system leading to a central treatment plant, has been successfully applied over many decades in densely populated areas of industrialized countries and has greatly contributed to improving the hygienic conditions in these areas. However, the appropriateness of this model in the context of cities in developing countries must be questioned, given their urgent need for affordable and sustainable infrastructure. A centralized wastewater management system reduces wastewater reuse opportunities and increases the risk to humans and the environment in the event of system failure. Centralized treatment systems are usually much more complex and require professional and skilled operators. Operation and maintenance of centralized systems must be financed by the local government often unable or unwilling to guarantee regular operation.

According to Census 2011, Uttar Pradesh has an urban population of 44.47 million people - which is 11.79 per cent of the total urban population of the country. The state has 653 urban local bodies (ULBs) including 17 Municipal Corporations (Nagar Nigams), 198 Nagar Palika Parishads and 438 Nagar Panchayats. The ULBs, with their limited local resources and state support, are responsible for provision of municipal services. A sanitation snapshot of urban Uttar Pradesh clearly indicates that households with onsite sanitation systems . The three pathways) like septic tanks (47 per cent) far exceed those with sewer connections (28 per cent). In the absence of even a single city that is completely sewered; most households, institutions, commercial areas and public/community toilets in the state depend on onsite sanitation systems like septic tanks and pit latrines. As there is no designated site for disposal, the emptied faecal sludge ends up in open drains nullahs/open fields, which eventually lead to polluting ( CSE, 2018) . Out of the 61 AMRUT cities, 34 have reported zero efficiency regarding collection and treatment of sewage. Aligarh, Agra, Bareilly, Ghaziabad, Gorakhpur, Jhansi, Kanpur, Lucknow, Varanasi, Muradabad, Meerut, Allahbad) are preparing City Sanitation Plan

with support from Ministry of Housing and Urban Affairs, World Bank, JICA and GIZ. In addition, 4 small and medium towns' Nagar Palika Parishads namely Ramnagar, Chunar, Bijnore and Gangaghat are being supported by Centre for Science and Environment (CSE) in preparing City Sanitation Plan and effective Faecal Sludge / Septage Management Plan (CSE, 2018).

## **Objectives and Methods**

Present paper is based on major research study conducted in Uttar Pradesh. The study purports to examine the status of urban sanitation in selected cities of state and suggesting roadmap for improving sanitation conditions. The present study is empirical in nature and based on mainly primary data collected through field survey. The sample comprises about 1200 urban households in Loni (Ghaziabad), Banda, Bahraich and Mirzapur Nagar Palika Parishads. All the cities are covered under AMRUT. The survey has been conducted with the help of structured interview schedule. The filled in interview schedules were thoroughly checked and processed through use of SPSS.

## **Profile of Selected Cities**

Uttar Pradesh is the most populous State of India with a total population of 19.96 crore according to Census, 2011, out of which 15.51 crore live in rural areas and 4.45 crore, constituting 22.28 percent, in urban areas. About 16 percent statutory towns of India exist in Uttar Pradesh. There are 648 statutory towns, 267 census towns and 653 urban local bodies in the state of Uttar Pradesh. There is a tremendous pressure on urban infrastructure systems especially water supply, drainage, sewerage, and solid waste management. As per census 2011, 34.04 percent toilets are linked with piped sewerage system while 56.39 percent toilets are depend on septic tanks in the state. A large number of toilets are having outlet in open drains which cause environmental pollution. We have selected four cities/ towns for the study. These cities/ towns are *Bahraich (Eastern Uttar Pradesh)*, *Loni (Western Uttar Pradesh)*, *Banda (Bundelkhand)*, and *Mirzapur (Eastern Uttar Pradesh)*. Mirzapur (Ganga), and Banda (Ken) are situated at the bank of rivers while Ghaghra passes from Bahraich district. All the towns are Nagar Palika Parishads and covered under AMRUT.

Bahraich is located in eastern tarai region of Uttar Pradesh. The town has urban population of 1,86,241 people with 30,061 households as per census, 2011. There are 9 zones in the town. The coverage of latrines was reported to be 87 percent, however, there is no sewerage system and sewage treatment plant. The waste generation was reported 27 MLD. Thus, there is huge gap of infrastructure for management of waste water and faecal sludge. Loni is situated in Ghaziabad district and has urban population of 512296 persons, spread in

14 zones. There are 91,138 households. The coverage of latrines (individual or community) was reported to be 99.94 percent with sewerage network coverage of 5.10 percent. There is sewerage network of 22.5 k.m, with sewerage treatment plant of 30 MLD with treatment efficiency of 50 percent. Banda is situated in Bundelkhand region and is rocky terrain. The urban population as per census, 2011 was reported to be 160473 spread in 31 wards and consists of 28748 households. The coverage of latrines was reported 57.55 percent as per SLIP under AMRUT. The sewerage network of 14.3 K.M. which constitute just 4 percent in the town. It is expected that 11563 households would be require septage management in 2021. Mirzapur is located in eastern Uttar Pradesh on the bank of river Ganga. It has urban population of 233691 and spread in 35 wards. There are 34029 households with coverage of latrines 77.81 percent. About 40 percent households are covered under sewerage system; however, efficiency of collection of waste water was r reported less than 40 percent. The length of sewer network was reported 240.4 k. m. with the capacity of 18 MLD sewerage treatment plant. It is expected that 16875 households would require septage management in 2021. There is no proper system of waste water and faecal sludge management in most the ULBs in the state. The ULBs have system for desludging the septic tanks and cleaning of chock of sewer line , however , there is no regular cleaning of septic tanks and private operators are emptying the tanks when there is any case of owe flowing is reported to them . They charge on their own and dispose of faecal sledge in open drains, water bodies or open spaces without any kind of treatment. Most of the septic tanks are not constructed scientifically and on standard norms and thus, there are higher risks of environmental pollution. There is no proper system of desludging, transportation, treatment and disposal of faecal sludge in the selected towns. This also causes higher level of ground water pollution. Thus, proper septage and faecal sludge management is required in the proposed towns. It would also be required to set up and made functional Faecal Sludge Treatment Plant in each selected town (Table 1).

**Table 1**  
**Sanitation Profile of Selected Cities**

<i>Particulars</i>	<i>Loni</i>	<i>Mirzapur</i>	<i>Bahraich</i>	<i>Banda</i>
Urban Population (Lakh, 2011)	5.12	2.33	1.86	1.60
No. of Wards	55	35	31	31
No. of Zones	14	12	9	6
Toilets Coverage	99.9%	77.8%	87.0%	57.5%
Length of Sewer Network	22.5 km	14.87 km	NIL	14.3 km
Coverage of Sewerage Network	5.1	39.5	NIL	4.0
Waste water Generation	36 MLD	27.2 MLD	27 MLD	20 MLD
STP Capacity	30 MLD	18 MLD	NIL	4 MLD

Source: SLIPs of Selected Cities

Government grant constituted a large chunk of municipal revenue in all the selected cities however, it was recorded high in Bahraich as compared to other cities. Tax revenue constituted a larger share in Loni (9.48 per cent) as compared to other cities. Similarly, non-tax revenue constituted a larger share in Banda as compared to other cities. The proportion of expenditure on sanitation services against total municipal expenditure was recorded high in Banda (11.69 per cent) followed by Mirzapur (9.3 per cent), Bahraich (6.07 per cent) and lowest in Loni (3.91 per cent).

### **Gender Mainstreaming:**

Gender equality is central to the realization of Millennium Development Goals. Gender equality, leading to increased work opportunities, enhanced capacities for livelihood developments, enhanced social protection and overall increasing voice may enable women to participate equally in productive employment, contributing to women's development leading to economic growth of the nation. No nation can afford development without considering women who constitute about half of the stock of human resources. Thus, engendering growth has been internationally recognized instrument of development by incorporating gender perspective and concerns at all levels and stages of development planning, policy, programmes and delivery mechanisms. The issue of engendering development and women empowerment has been in the central stage with the shifting of paradigm of development and governance at the global level and particularly in India Engendering development

and inclusive growth requires an enabling environment in which women's contribution to the economy can be tapped and enhanced in a substantial and holistic way. This environment needs to ensure from conception to death – an environment that provides physical, emotional, economic and political and community security to girls and women. The engendered development also requires addressing the issues of accountability, capacity building and governance that are of utmost importance for gender equity and inclusive growth. Women's role in decision making institutions needs to be enhanced through providing them reservation and enforcement and implementation of all pro-women legislations.

Women being under represented in planning process, JNNURM provided an opportunity to build gender fair and inclusive cities. It seeks to promote planned urban development and equitable cities. Though, urban space, infrastructure and services which contribute to cities economic development, however men and women perceive their utility differently. Infrastructure development is not gender neutral. Lack of basic services affects both men and women; however women in cities especially in low income communities and slums are more severely affected by inadequate and poor services. In absence of access to toilets, women are forced to defecate in open which is unsafe and undignified while it is also a serious health and environmental threat. Women have traditionally been excluded from land ownership and it has contributed more marginalization of women as they are insecure and live in poverty. Women either do not work for wages or earn less than men. Because of their low earnings they cannot afford to buy a house or land for construction of house. Since, women often lack education and technical skills; they tend to be predominantly in informal economy. The informal sector is under regulated and social safety network is lacking. Among the poor, forced evictions from illegal spaces (slums) are a major cause of insecurity. The demolitions of slums not only destruct homes, but also destroy the informal livelihoods. The women being the most vulnerable and disadvantaged group, are mostly affected by such evictions. Women living in slums and low income groups also face problem of domestic violence as the family income is very low to sustain the family. Women and children experience domestic violence through physical abuse sexual assault and threats. Urban violence against women can be attributed due to lack of their power that comes from non ownership of property and shelter. Urban women are also more dependent on public transport to move in the city however, men usually own personal transport. Women use transport differently from men based on the type of work they do. Urban women are bearing more burdens of diseases. Urban poor women are more anemic and modality rate among them is higher.

There is need to set out a clear urban gender policy that will provide the framework for the gender integration. A general policy must have four key components:

- Bring a gender perspective into all aspects of planning, policy and legislation and activities that are within the domain of the Ministries.
- Create an enabling environment for women and thus to realize their full human rights in cities and particularly for women belonging to poor and marginalized groups.
- Outline sustainable mechanism for the equal participation of all including poor women in city development.
- Promote equitable access and control over the urban resources for women and men.

Gender mainstreaming is about promoting inclusive and participatory planning and development of the cities. Women empowerment is essential for inclusive development. Women empowerment through mobilizing and organizing in groups that promote micro-finance and ensure their participation in development planning and livelihoods is imperative. Public private partnership with civil society's involvement for gender equality is an effective instrument for improving basic services to urban poor including women.

Gender-based disadvantages in access to urban water supply are discussed below:

- Time and opportunity cost for work lost due to time spent in water collection.
- Conflicts and fights regarding space to wash clothes and cook.
- Physical and sexual harassment in public transport while collecting water from distant places.
- Exposure to physical and sexual violence while collecting water from tankers.
- Absenteeism and dropout rate of girl children from schools.
- Unsafe drinking water raises the risk of women, men and children being susceptible to waterborne diseases such as cholera and diarrhoea, affecting their health and subsequently livelihood.

Gender-based disadvantages in access to sanitation, sewerage and drainage are given below:

- Incidents of sexual harassment while availing sanitation facilities at Community Toilet Complexes:

- Poor and faulty design of Community Toilets Complexes (CTCs) which put women at the risk of being harassed.
- CTCs are not open for the entire day which causes inconvenience to women to meet their sanitary needs.
- Inadequate and unsafe sanitary public infrastructure causes loss of dignity and privacy to women who are forced to resort to open defecation.
- Inadequate infrastructure raises vital safety concerns for women as they are sexually assaulted or attacked when they resort to open defecation.
- Women have to wait until dark to defecate and urinate in the open, so tend to drink less water during the day, resulting in all kinds of health problems such as urinary tract infections (UTIs).
- Poor maintenance and design of drains leading to conflicts that put women at risk physically.
- Loss of dignity and privacy while disposing menstrual waste.
- Hygienic conditions are often poor in public defecation areas, leading to worm infestation and water-borne diseases.
- Girls, particularly after puberty, miss school due to lack of proper sanitary facilities for dealing with menstrual hygiene.

## **Discussions of Results**

Majority of the respondents reported that potable drinking water is available in their house. This was found more pronouncing in Bahraich (96.1 per cent) followed by Mirzapur (95.2 per cent). However, about 82 per cent respondents in Loni and more than half of the responding in Banda revealed that potable drinking water is not available in their house. . More than half of the respondents reported that they have individual tap for drinking water. This was found more pronouncing in Banda followed by Loni and Bahraich. About 1/3<sup>rd</sup> respondents in Mirzapur had public stand post for drinking water while about 2/5<sup>th</sup> respondents in Bahraich had individual hand pumps for drinking water. It is to be noted that Banda is located in drought prone area of Bundelkhand. The water crisis during summer gradually increases due to less water availability of water in Ken River. Duration of water supply was reported fewer hours as about 1/3<sup>rd</sup> respondents revealed that water supply in their areas are 4 to 6 hours. This was found more pronouncing in Loni (67.1 per cent) followed by Mirzapur (61.6 per cent). More than 3/4<sup>th</sup> respondents in Banda revealed that water supply is less than 2 hours. Thus, water supply for longer hours was recorded high in Bahraich. About 2/3<sup>rd</sup> respondents

reported that water supply in their house is through municipal tap. This was found more pronouncing in Banda (82.7 per cent) followed by Loni (69.4 per cent). About 2/5<sup>th</sup> respondents in Bahraich reported that they have hand pumps in their house. About 23 per cent respondents in Loni revealed that they are taking drinking water from bore wells. Lack of toilets, inadequate of toilets, dilapidated toilets, clogging of toilets, disposal of faecal sludge in area, flies and termites, long distance of toilets and poor maintenance of toilets are some of the sanitation problems.

Toilet coverage was reported 87.3 per cent. This was found more pronouncing in Loni (91.6 per cent) followed by Bahraich (88.3 per cent) and Banda (87.6 per cent). The toilet coverage was recorded low in Mirzapur (81.3 per cent). Again, 56 per cent respondents reported that they have individual separate household toilets. This was recorded high in Loni (72.8 per cent) followed by Banda (70.6 per cent). About 58 per cent respondents in Bahraich and 30 per cent respondents in Mirzapur reported that they have individual joint household toilets. About 9 per cent respondents revealed that they are defecating in open. This was recorded high in Mirzapur (13.1 per cent) followed by Banda (11.1 per cent) and Bahraich (10.7 per cent). It is to be noted that open defecation is more prevalent in the slums and backward areas of the cities. In Mirzapur, survey was also conducted in Vindhychal region as Nagar Palika has its jurisdiction over Vindhychal region. Access to public and community toilets was recorded high in Loni (8.3 per cent) followed by Mirzapur (5.5 per cent) and low in Bahraich (0.9 per cent). Most of the respondents reported that they flush toilets. However, traditional pit latrines were also recorded in Banda, Mirzapur and Loni. Lack of funds for toilet construction, lack of toilets in house, lack of space for toilet construction, old house and habitual for open defecation are some of the important reasons responsible for open defecation. However, reasons vary across the selected cities. Respondents were asked that whether community toilets have been constructed. About 16 per cent respondents revealed that community toilets have been constructed in their areas. This was found more pronouncing in Bahraich (24.3 per cent) followed by Mirzapur (22.1 per cent). Thus, majority of the respondents reported that community toilets have not been constructed in their areas. It is to be noted that community toilets have been constructed mainly in backward and slum areas of the cities. The respondents were asked about maintenance of community toilets in their areas. About 57 per cent respondents reported that community toilets are being maintained by ULBs. It was found more pronouncing in Mirzapur (87.5 per cent) followed by Loni (83.9 per cent). About 55 per cent respondents in Bahraich reported that Sulabh International is maintaining community toilets. Shramik Bharti is also maintaining community toilets significantly in Banda, Bahraich and Mirzapur. Majority of the respondents in Banda further reported that private organizations are maintaining community toilets.

Employees of ULBs and sanitary workers are mainly responsible for cleaning of community toilets. However, a significant proportion of respondents in Mirzapur and Bahraich reported that community is responsible for cleaning of community toilets. About half of respondents were found satisfied with cleaning of community/public toilets. This was found more pronouncing in Loni (92 percent). However, majority of respondents in Mirzapur and Bahraich were found dissatisfied with cleaning of community /public toilets. The respondents were asked that whether charges of community and public toilets are reasonable. About half of the respondents reported that user chargers of community /public toilets are reasonable. This was found more pronouncing in Loni (84 per cent). However, a large proportion of respondents in Banda, Bahraich and Mirzapur could not respond on the view point. The respondents were further asked that whether all family members of are using toilets. More than 3/4<sup>th</sup> respondents revealed that their all family members are using toilets. This was found more pronouncing in Loni followed by Mirzapur and Banda. However, about 2/5<sup>th</sup> respondents in Bahraich could not respond on the view point. The respondents were asked that who cleans these newly constructed toilets. Majority of the respondents reported that they themselves and their family members are cleaning newly constructed toilets. However, a significant proportion of respondents also reported that domestic servants and sweepers are cleaning these toilets. Satisfaction of sanitation services was recorded high in case of collectionof waste, sweeping of streets/roads, transportation of solid waste, water supply, cleaning of drainage and flow of water. However, dissatisfaction was recorded high in case of cleaning of public toilets, maintenance of sewerage, cleaning of drainage, flow of water (Singh,2018).

The overall analysis demonstrates that sanitation conditions in small cities are no better than other cities of the state. The institutional arrangements and infrastructural facilities are adequate for providing sanitation services in small and medium cities. The sewerage services were found partial in Mirzapur and Loni while sewer system in Banda is defunct. The facilities for sewage treatment are grossly in adequate in all the selected cities, even there is no such facility in Bahraich. Thus, most urban households are found depending on septic tanks which are also scientifically designed and constructed. There is no proper and scientific arrangement for regular desludging, treatment and disposal of faecal sludge in the selected cities, however, system has been developed in Loni for emptying of vacuum tank after desludging at certain points, directly connecting to sewer system for treatment at STP. Similarly, in Bahraich , attempts have been made to regulate the desludging of septic tanks through maintain a proper records of citizens. The citizens are hardly bothered about regular cleaning of septic tanks as they opt of desludging of septic tanks in case of overflow or blockages. All ULBs have suction machines for cleaning of septic tanks , however, the capacity of such machines and required

equipments are not adequate. The people in small and medium cities are still defecating in open and use community / public toilets in absence of individual household toilets. The public and community toilets were found adequate in Loni, however, in other selected cities, it was found grossly inadequate. The water supply was found worse in Banda as during summer, water sources based on surface water gradually shrink due to excessive mining, damming of river and high demand. Thus, sanitation services get set back in the city during summer. The door to collection solid waste has been introduced partially in the selected cities, however, in Bahraich, it was found better due to engagement of private firm for the cause.

## **Conclusion**

The overall analysis demonstrates that sanitation conditions in small cities are no better than other cities of the state. The institutional arrangements and infrastructural facilities are adequate for providing sanitation services in small and medium cities. The sewerage services were found partial in Mirzapur and Loni while sewer system in Banda is defunct. The facilities for sewage treatment are grossly inadequate in all the selected cities, even there is no such facility in Bahraich. Thus, most urban households are found depending on septic tanks which are also scientifically designed and constructed. There is no proper and scientific arrangement for regular desludging, treatment and disposal of faecal sludge in the selected cities, however, system has been developed in Loni for emptying of vacuum tank after desludging at certain points, directly connecting to sewer system for treatment at STP. Similarly, in Bahraich, attempts have been made to regulate the desludging of septic tanks through maintain a proper records of citizens. The citizens are hardly bothered about regular cleaning of septic tanks as they opt of desludging of septic tanks in case of overflow or blockages. All ULBs have suction machines for cleaning of septic tanks, however, the capacity of such machines and required equipments are not adequate. The people in small and medium cities are still defecating in open and use community / public toilets in absence of individual household toilets. The public and community toilets were found adequate in Loni, however, in other selected cities, it was found grossly inadequate. The water supply was found worse in Banda as during summer, water sources based on surface water gradually shrink due to excessive mining, damming of river and high demand. Thus, sanitation services get set back in the city during summer. The door to collection solid waste has been introduced partially in the selected cities, however, in Bahraich, it was found better due to engagement of private firm for the cause.

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