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Access to Water supply and Sanitation Services: A study of urban poor in Bhubaneswar city, Odisha

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Abstract

Urbanization is a process which contributes to an increase in urban population. According to 2011 census the 31.16% population live in urban areas in India. In India, a large proportion of the urban population are living in slum areas (17.4 %) spread across the country due to the growth in the urbanization process. Millions of people, largely poor, with the hope, to earn their livelihood and to support their families migrate from rural areas to urban areas. However, as they land-in, the harsh realities of city life shatter their dreams of a better life which they dreamt before coming. Most of the people who migrate to cities or towns and who cannot meet the expenses to find proper shelter can be found living in slum and shanty areas of those cities or towns. They are forced to live in the hardest conditions and most of them even are not able to bear the basic minimum amenities such as food, drinking water supply, and sanitation. However, unsafe drinking water supply and poor sanitation is the major problem of urban India's slum population. Illnesses caused by unsafe drinking water and inadequate sanitation generate health costs that can claim a large share of income. Every year millions of people are affected with water bone diseases, while thousands of children die annually due to diarrhea in India. The present paper describes to access water supply and sanitation services in the urban Poor, Bhubaneswar city, Odisha, a state in India with the second-highest poor sanitation and water supply facilities. The paper also would capture the experiences of water-borne diseases of the people and government and non government intervention for improvement of water supply and sanitation condition in the state. The data has been collected using both primary and secondary sources. Primary data has been collected from the respondent through a semi-structured interview schedule and focused group discussion. The secondary data collected from various journals, census reports, newspapers, National Sample Survey Organization (NSSO), District Level Household & Facility Survey (DLHS), and Odisha municipality official documents. The finding of the study is the majority of the household member went outside for open defecation because the toilets had no water supply facilities. The paper will be concluded by major findings and suggestions on the policy implementations for tackling the challenges of water supply and sanitation facilities for the urban poor.

Key Words: Urbanization, urban poor; water supply and sanitation condition

Introduction

Urbanization is a process that contributes to an increase in the urban population. It is a phenomenon throughout the world. In the present era Urbanization is broadly defined as a process in which a large number of people are settled in a specific geographical area and people in such areas are mainly dependent on non-agricultural activities for their subsistence and government support to them (Anthony, 2004). According to the 2011 census the 31.16% population were living in urban areas in India, and the population was living in the 4,378 town and cities across the country. Every year millions of the population are migrating rural areas to urban areas for living better conditions of life. Data shows that in India from2001 to 2011 the growth rate of the urban population was 91.0 million (RGI, 2011). Those people are migrating rural areas to urban areas for living in better conditions life due to poor economic conditions force to living in slum areas. As per the 2011 census, 17.4 %, of the population in urban areas was living in slums. It amounted to million people consisting of 137.49 lakh households who were living in slums in 4,378 reported towns spread over 26 states and Union Territories.

Out of the 29 states in India Odisha ranks 24th in the level of urbanization, where 16.9% of the population is living in urban areas, spread across 138 towns/cities governed by 103 urban local bodies, two municipal corporations and 101 municipalities all over the state. Bhubaneswar is the biggest growing city of Odisha and is the capital of the state too. Bhubaneswar has a population of 12 lakh of which 30% live in slums (Rout, 2008). There are 178 slums identified, out of which 101 are registered with Bhubaneswar Municipal Corporation (BMC). Slum areas have a problem in accessing basic amenities like housing, food, transport water supply, and sanitation. Water supply and sanitation is a major problem for people living in Bhubaneswar with a rapid rate of urbanization. As per the 2011 census in Odisha, 16.9% of the population were living in urban areas and in Khurda district where the highest population are living in urban areas. (RGI, 2011) They migrated from rural areas to urban areas for fulfilling their dreams of better lives through livelihood opportunities in urban areas. Their poor economic status, however, can only allow a dwelling unit in the slums. They have no alternative but to live in the slums and face many problems related to basic facilities and water supply and sanitation issues one of the major problems. This article has centrally focused on water supply sanitation conditions in slum areas.

Review of Literature

The growth of urbanization one of the major reasons of people migrates from rural area to urban area in India. The high growth of the urban population is a result of overcrowding, unsanitary conditions, air pollution, unhealthy and hazardous working conditions, transportation problems, and also weakening of community ties. These problems are faced especially by the poor people who are living in slum areas (Priya, 2006). The growth of urbanization is a cause of the increase in environmental pollution, deforestation, accidents, traffic jam, crimes, unemployment, poverty, slums, and water and sanitation (Padam and Singh, 2004; Ilchman, 1969; RGI, 2011 and Abernethy, 2002).

Due to the growth of urbanization, various issues occurred and water supply and sanitation one of the major issues today especially focused in the urban area. It amounted to million people consisting of 137.49 lakhs households who were living in slums in 2543 reported towns spread over 26 states and Union Territories (NSSO, 2001; RGI, 2011; Chandrasekhran, 2005, NFHS, 2006). In the slums area, housing one of the major problems and approximately 44.8% of the population were living in a single tenement room. Around 29% of the population were living in two rooms and the houses are in poor condition. Most of the houses have water supply, toilet bathroom facilities (Sirdheer and Kumar, 2013). According to WHO figures, 884 million people do not have access to safe drinking water and 2.6 billion people do not have access to sanitation facilities (WHO-UNICEF, 2002). Every year, 1.8 million people die of diarrhea and 90% of children under five die due to the inadequate water supply and sanitation condition (Haller, *et al*, 2007). Vanmin and Hung (2011) study show that in developing countries, people's economic growth and health condition depend on improved sanitation condition. Poor sanitation results in a number of diseases worldwide and 10 percent of the total global burden of disease is due to poor sanitation and unsafe water supply. About 1.1 billion people are living on inadequate water supply and 2.4 billion people without adequate sanitation till the end of the year 2000 (Mara, 2003).

Eldman, B., & Mitra, A (2006) stated that in India millions of people were facing problems related to the water supply to fulfill their daily requirements. The issue of inequality, quality, affordability, and accessibility to the water supply among the poor slum dwellers of Chennai, Tamil Nadu was highlighted by Anand (2007).

Bapat and Agarwal, (2003) reflected in their study that slum dwellers demanded in Mumbai that voting in the local elections was governed by the promise to provide water.

As per the 73rd amendment, the responsibility of the supply of drinking water and sanitation services lies with the local governments (Fletcher, 2002). Therefore the first national water policy came in 1987 and 2002 to give equal space to all human beings and livestock in both urban areas and rural areas for drinking water. As like that in 2008, the government of India started a national urban sanitation policy. The main of the policy was envisaged to be total sanitization of all the cities India and gave special focus to universal access to toilets, hygienic condition, and sanitation facilities for improvement in the health condition. Creation of the good environmental conditions in urban areas was given special focus as well. In the case of urban Odisha, both water supply and sanitation policy was less achieved and thousands of people are living without proper water supply and sanitation. As per the 2011 census, only 42 percent of the urban population were get treated with water and 35% of households had no toilet facility. Especially

Objective of the study

The present paper describes the access to water supply and sanitation services in urban poor, Bhubaneswar City, Odisha.

Methodology

It is a cross-sectional study. Both primary and secondary data were collected for the study. The primary data includes data collected through interviews and focus group discussions with the residents of two slums (authorized and unauthorized). Also, the primary data of both quantitative and qualitative nature was collected. The secondary data are collected from the various newspaper, gazetteer, Odisha census office, Bhubaneswar Municipality Corporation (BMC), District Household and Facility Survey (DLHS), National Sample Survey (NSS), District Census Handbook, Registrar General of India, National Family Health Survey (NFHS) data, and Published Official Documents and reports. Purposive sampling was adopted for collecting the data. The study area was selected on basis of its administrative status and period of existence. More or less both the areas are approximately located close to the centre of the city which makes easy accessibility of basic services for people living in this area. These two slums have been chosen for comparative analysis of the condition of water supply and sanitation. Purposive samplings have been used to identify the primary and secondary units of the study. The primary data was collected from 27 October-2013 to 15-December-2013. Households were taken as the sampling unit for the proposed study. The sample size was 200 households distributed proportionately between the two slums of the study areas. The respondents who participated in the present study include the heads of the households which were identified as selected for the data collection. In case of absence of the head of the households, interviews were done with any responsible household members who were above the age of 18 and below 70 of age. Children, old age, mental patients, and ill members were excluded from the data collection process in this study.

A closed and open-ended questionnaire was prepared to conduct semi-structured interviews. The coding was established for different variables of the research questionnaire. The collected data were statistically analyzed using statistical package for social science (SPSS). Entered data were analyzed in terms of frequency of different variables and correlation among relative variables in order to establish associations between them. Descriptive statistic of simple percentages was applied to describe the characteristic of the respondents of the study. Cross-tabulation of data between two variables was done to further present relationships more clearly.

Socio-Demographic Profile of the Study Area

In Odisha, the urban population of 16.68% spread 223 town/cities and 103 urban local bodies, three municipal corporations, and 101 municipalities all over the state. In Odisha, 15% schedule caste and 8% scheduled tribe are living in the total urban population. Bhubaneswar is the biggest growing city of Odisha and it is the capital of Odisha. In Bhubaneswar, 12 lakh population people live in the city and 30% percent of the population are living in slums (Rout, 2008). There are 436 slums identified, out of which 116 are registered with Bhubaneswar Municipal Corporation (BMC). Bhubaneswar city has a population of 12 lakhs of which 30% are living in slum areas. The majority of the slum population belonged to different districts of Odisha. Mostly from poor socio-economic backgrounds, people shifted to these slums with the hope of improvement and better living conditions for themselves and their families.

This section presents the relevant demographic characteristics of the respondent who participated in the research. This information includes the distribution of socio-demographic characteristics like age, sex, education attended religion, social identity, marital status, and total no of the family member. The majority of respondents who participated in the present study were female (50.8 %) and followed by male (49.2%) respondents. Both study areas indicate that majority of the respondents (21.50%) between 25-35 years of age, followed by (16.30%) between 10-18 years. Only 0.90% of the respondents were above 65 years, participate in the study (Table 1). In literacy rate and educational level analysis, below six-year age group. Information about the education shows that the majority of the respondents (36.0%) were illiterate and 63.77% were population literate. The data on religious affiliation indicates that the majority of the respondents living in the study area were Hindus (89.50%) followed by Christian (5.50 %) and lastly Muslim (5.0%) in the study. The data on social identity shows that the majority of the respondents (41.5%) were from OBC, followed by 23.5 % from general castes, 20.0 % Scheduled Castes, and 15 % schedule Tribe. The data on the marital status of the respondents showed that the majority of the respondents were married (49%), while a small percentage of the respondents were unmarried (49.8%). While one percent of the respondents were widowed and (0.2%) were of the respondent divorced (Table 1).

Table 1: Socio-Demographic profile of the study population

Socio-Demographic Profile of Study Areas		Number	Percent
Sex Composition	Male	433	49.3
	Female	445	50.7
Age Distribution	>5 five	102	11.60
	5-10yr	96	10.90
	10-18yr	143	16.30
	18-25yr	137	15.60
	25-35yr	189	21.50
	35-45yr	91	10.40
	45-55yr	65	7.40
	55-65yr	47	5.40
	65<	8	0.90
Occupation Present	Not Working	557	63.4
	Business	18	2.1
	Driver,	25	2.8
	Mason,	35	4
	Govt job	5	0.6
	Labour	237	27
	Private	1	0.1
Income Group	Not working	557	63.4
	>2000	9	1
	2000 to 4000	238	27.1
	4000 to 6000	56	6.4
	6000 to 8000	7	0.8
	8000 to 10000	7	0.8
	10000<	4	0.5
Current Marital Status	Married	430	49
	Unmarried	437	49.8
	Widowed	9	1
	Divorced	2	0.2
Religion Composition by the Households	Hindu	179	89.5
	Muslim	10	5
	Christian	11	5.5
Social Identity	SC	40	20
	ST	30	15
	OBC	83	41.5
	Non SC, ST, OBCs	47	23.5

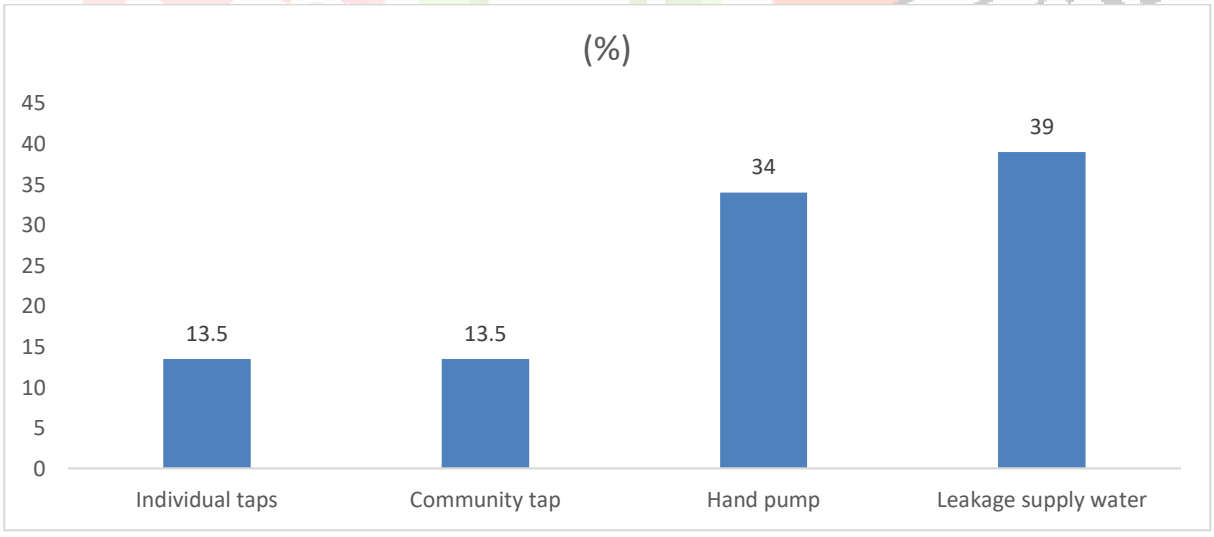
Migration Pattern	Village	151	75.5
	Town	48	24
	Inter State	1	0.5
Tupe of Housing	kaccha	90	45
	Semi-Pucca	43	21.5
	Pucca	67	33.5
Separate Space for Cooking	Yes	43	21.5
	No	157	78.5
Electricity Facilities	Yes	108	54
	No	92	46
Ownership of the Households	Own House	154	77
	Rented House	46	23

Source: Fieldwork

Sources of water supply facilities

In the study area data shows that among the total household only 13.5% of the household had individual taps and 13.5% of the household depended on community tap water. Among the total surveyed population 34% of the household were dependent on hand pump water and 39% of the household were dependent on Leakage pipe water (Figure 1). In the slum, because they are crowded, people faced many problems in collecting the Leakage supply water, sometimes there were fights in the slum while collecting water from Leakage supply water. More problems arose because of the limited time of the water supply which made it difficult for everybody to get water. The local leader in the slum responded that "*In the slum, the lack of availability of water supply is a major problem in the area. The whole population in the slum is depending on Leakage supply pipe water. But when the Leakage supply pipe water is stopped, it is very difficult to manage life"* One of the key informants responded that the "*Water has the important role in day to day life, without food we can manage some time, but without water, it is very difficult"*. Another of the respondents expressed that "*Every year some people come in the slum and they asked many questions about our condition. We people responding to them, but we people are not getting any facilities from them". He further added that "In the Bhubaneswar city, where our people are living without basic facilities but our people have the right to vote in the city for choosing the governments*

Figure 1: Source of water supply in the study area



Source: Fieldwork

Distance travelled to fetch water collection

Among the total surveyed population, 34% of the household responded that the distance travelled to fetch water fifteen meters to fifty meters and 20% of the household responded that they walked more than half a kilometre. The distance to collect water more than half km and they are facing problems because carrying water from there to home is too difficult for them. Nineteen percent of the household responded that they did not know the distance they travelled to fetch water and 11.5% of the household responded that they walked fifty meters to a hundred meters to fetch water. Nine percent of the household responded that they walked one

hundred meters to two hundred meters to fetch water and 6.5% of the household responded that they walked two hundred meters to four hundred meters to fetch water (Table 2).

Table-2: Distance travelled to fetch water collection

Distance travel to fetch water	N(Percent)
Don't Know	38 (19)
15 - 50 Meters	68(34)
50 - 100 Metres	23(11.5)
100 - 200 Metres	18(9)
200 - 300 Metres	13(6.5)
More than Half kms	40(20)

Source: Fieldwork

Duration of water supply

The data shows that of the total sample household surveyed, 73% of the households don't know the duration of water supply in the morning time, 15% of the household responded that the duration of water supply was only one hour and 11% of the household responded that they received four hours of water supply. Only 0.5% of the household responded that the duration of water supply is two hours only. Likewise, 50% of the respondents have reported no water supply in the evening time and 45% reported they did not know no about the supply of water came or not in the evening time. Only 5% of the respondents were reported the water is coming two hours in the evening time (Table 3).

Table-3: Duration of water supply

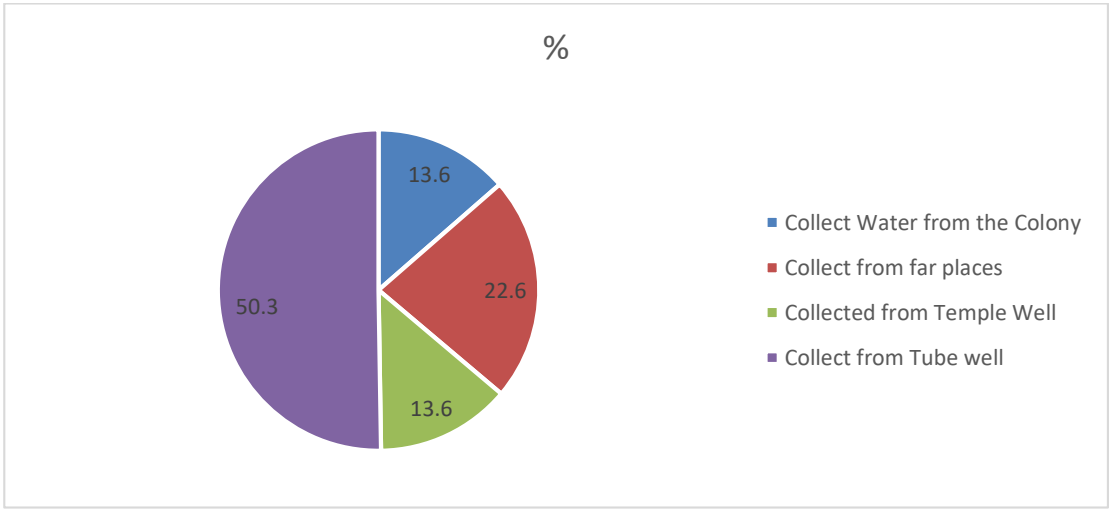
Morning time	N (Percent)
One hour	31(15.5)
Two Hours	1(0.5)
Four Hours	22(11)
Don't Know	146 (73)
Evening time	
Don't Know	90 (45)
No Supply	100(50)
Two Hours	10 (5)

Source: Fieldwork

Problems-related water supply

Data regarding the problems related to safe drinking water when there is no water supply from the PHED was also collected. The data shows that 50.3% of people were depending on the tube well when pipe supply water was not coming. Water was collected from sources far from their homes by 22.6% of the population from the study area, 13.6% collected from the colony and 13.6% collected from temple well water (Figure 2). In the unauthorized slum, the majority of the respondents answered that the government did not provide anything in the slum because of which people were facing many problems. Some of the respondents explained that, in natural calamities such as cyclone, flood time they were facing many problems, and even during those times the government was not providing water supply because of which they were forced to use well water. The well water was impure and people were facing problems like dehydration, stomach pain, and gastric problem. The data collected also shows that in the summer season they face many difficulties because of poor government supply and even the leakage pipe water also stops, during this, some of the households collected water from the colonies and managed their life. In the authorized slum, where the duration of PHED water supply is for only one hour which is a very short duration and thirty to forty families were dependent on only one tap point The duration of water supply proves insufficient to maintain daily activities resulting in people being depended on hand pump water for their other needs.

Figure 2: Problems-related to collect drinking water



Source: Fieldwork

Availability of toilets facilities in the house

Among the total surveyed population, 55.5% had no latrines and they preferred open defecation. Around 24.5% had latrines inside the house and 20% had outside the house (Table 4). In a slum, everything needs to buy from the market and all the earned money is usually spent to maintain daily life. Due to poor economic conditions, they were not able to build in house latrines. The government provided community toilets in other slums, but in this slum, the government had not provided anything. They also mention that they had requested ward members many times, but no toilet facilities were provided in the slum. In the slum area, the government had provided community toilet facilities, but due to the poor condition of latrines people were not using it. Ashok 43 years old respondents mentioned that "… We *people were not getting always labour work and per month income has not sufficient for us to maintain our family".*

Place used for defecation

Among the total surveyed population, 56% went for open defecation, 43.5% had their toilet, and 0.5% used community toilets. In the unauthorized slum, people are for open defecation because in the slum there were no community toilet facilities, and the government was also not providing the toilet facilities in the slum (Table 4).

Table-4: Available toilet facility in the house and disposal defecated substance

Availability toilets in the house	**N(percent)**
Inside House	49(24.5)
Outside House	40(20)
No Toilet	111(55.5)
Placed use for defecation	
Public toilet	1(0.5)
Open space	112(56)
Own toilet	87 (43.5)
Disposal defecated substance	
Carrying Water in the Bucket	87 (43.5)
No toilet	106(53)
Supply Water	7(3.5)

Source: Fieldwork

Disposal of defecated substance if toilets Don't have the water supply

Among the total surveyed population, 43% were carrying water in the bucket for disposing of the defecated substance and 3.5% had the supply water facilities for the defecated substances those households had no regular water supply in the latrines. It was observed that those who had a water supply in the latrines, were economically well off than the others. Fifty-three percent had no water supply facilities for disposing of the defecated substance (Table 4).

Mechanism for used to dispose of household garbage

The data collected from the total surveyed population shows that 91.5% dispose of household garbage in the open space outside the house. Around 8.5 % of the households dispose of the garbage in the bin provided by the BMC. In the unauthorized slum municipal worker never comes in slums and the government also was not providing any facilities for garbage collection. In the authorized slum majority of the households disposed of the garbage in an open space outside the house and very few households use garbage bins provided by BMC. In which authorized slum, the garbage bins were damaged and the government had not provided new garbage bins in the slum resulting in the garbage being disposed of in the open space (Table 5).

Table-5: Mechanism used to household's garbage and collection by the BMC workers

Mechanism used to households garbage	**N (Percent)**
Open space outside the house	183 (91.5)
Garbage bin provided by BMC	17 (8.5)
Frequency of garbage collection by the BMC workers	
Daily	40(20)
Once a Week	8(4)
Twice a Week	11(5.5)
More than Twice a Week	8(4)
Never	33 (66.5)

Source: Fieldwork

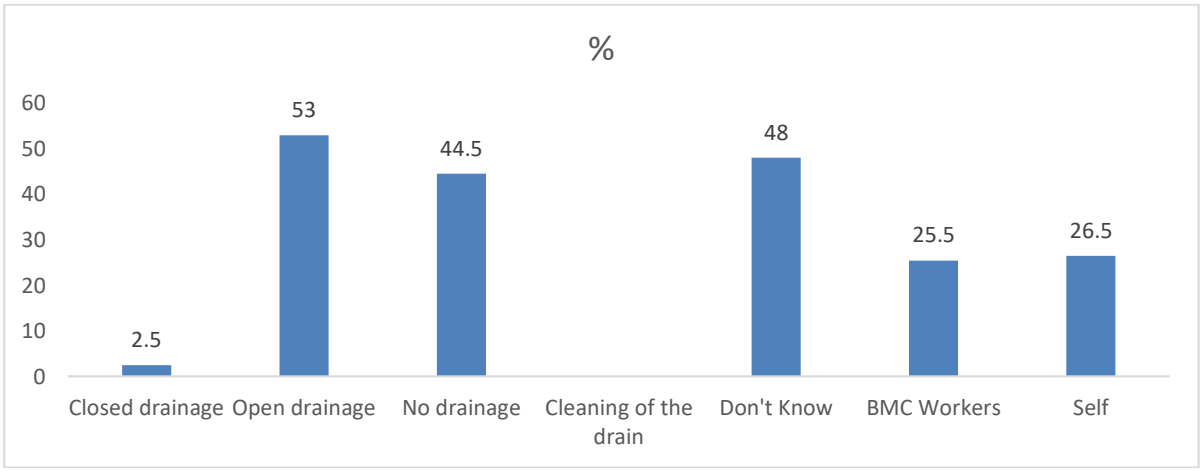
Frequency of Collection by the BMC Workers

The data also collected showed that 66.5% of respondents said that BMC workers never came to their slum to collect the garbage. Twenty percent responded that the BMC workers collected the garbage regularly and 4% responded that BMC workers collected the garbage once a week Around 5.5 % responded that the garbage was collected twice in a week and 4% responded that it was done more than twice a week (Table 5).

Types of Drainage Outside Households

Among the total surveyed population 53% had open drainage systems outside the household, 44.5% had no drainage outside the household and 2.5% had closed drainage outside the house. In the unauthorized slum majority of the HHS had no drainage outside their HHs. Very few HHs had open drainage outside their HHs. In the authorized slum, the drainages were open, water was stagnant, not proper cleaning or maintenance resulting in a stench coming from the drains. The majority of the respondents answered that when the drainage was not built it was better, but after the drainage because of many problems that accompanied the drainage it very difficult to manage. The drainage would get blocked due to stagnant water and the sanitary worker also did clean the drainage properly. Mosquitoes and common illnesses associated with it have made life very difficult (Figure 3).

Figure 3: Types of drainage in front of the house and maintenance of drainage



Source: Fieldwork

Maintenance of the Drainage System

Among the total surveyed population, 48% responded that they did not know who was cleaning the drainage in the slum and 26.5% responded that, the household member was cleaning the drainage regularly in front of the household. Around 25.5% responded that the BMC workers were cleaning the drainage. In the authorized slum, most of the respondents did not know who was cleaning the drainage. In the authorized slum majority of the respondents had aware about the BMC workers were cleaning the drainage (Figure 3).

Discussion and Conclusion

Due to the growth of population people have migrated from rural areas to urban areas for living better conditions of life but due to the poor economic condition they leaving in slum areas. In the slum areas, they were not able to fulfill their basic needs and water supply sanitation is a major problem for urban poor's those were living in slum areas. Every year the BMC area increases due to the high growth population in Bhubaneswar city and rural areas under the BMC. In Bhubaneswar city, BMC provided basic facilities such as pipe water supply, sanitation, housing, electricity, and community toilets and street lights. The present study understands the urbanization and challenges of water supply and sanitation in two slums in Bhubaneswar city. The government is unable to fulfill the needs of the people in the ever-increasing slums of Bhubaneswar due to the increased migration from rural to urban areas. The data was collected from both primary and secondary sources. Both the slums areas chosen for the study had poor water supply and sanitation. The secondary source shows that in Bhubaneswar city various international, central, and state governments' schemes for water supply and sanitation for the urban poor were implemented. But still due to various problems the schemes have not covered the entire urban population especially those living in slum areas. The primary data was collected from the study areas in Bhubaneswar. The data shows that majority of the population had no pipe water supply facilities and had to go outside for open defecation in both unauthorized and authorized slums in the study areas.

In both, the study slums the condition of water supply, and sanitation facilities were not that developed. The majority of the households were dependent on leakage pipe water supply were going outside for open defecation. The majority of the population who were dependent on leakage supply water paid the government workers every month and they did not pay the government they take. The government is not providing any facilities in the areas and people were facing many problems. Some of the families in the slum areas with electricity, tap water supply, and individual toilets had lived in better conditions of life. Some of the families had illegal tap water supply connections in the slum. If the government provided water supply and community toilet facilities then definitely the standard of living of the people will improve.

The duration of the water supply is not suitable to fulfill their family needs. If the duration of the water supply increases, and more tap points, and cement tanks for storing water, then definitely the quality of life will be changed in the slum. The majority of the population was throwing the garbage outside which was not even collected properly by the sanitary workers. The drainage system in the slum was in a very poor condition due to stagnant water creating bad odor in the slum. Therefore, people face various health-related problems. Keeping in mind the fast pace of urbanization of Bhubaneswar and the consequent attraction that it is exerting on urban ward migration, especially of the poor people, growth of slums and the urban poor is inevitable. Therefore, the state must take note of these people who come to the city in search of livelihoods and provide the city cheap labor while living in appalling conditions. Provision of water and sanitation facilities are the basic services which the urban poor should be ensured of in the urban places of a destination like Bhubaneswar.

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