



GSJ: Volume 5, Issue 9, September 2017, Online: ISSN 2320-9186
www.globalscientificjournal.com

ASSESSING ACCESS TO URBAN WASTE WATER MANAGEMENT SERVICES IN MAIDUGURI

Abdullahi Babagana, Fandi Shettima Ali

Department of Urban and Regional Planning, Ramat Polytechnic, Maiduguri. babagfly@gmail.com
Department of Geography, Ahmadu Bello University, Zaria. yafandishettima@gmail.com

KeyWords

Waste water services, Urban services, Access, Sanitation, Black water, Grey water, Maiduguri

Abstract

This study was designed to assess access to waste water management services in Maiduguri. Questionnaires were administered to 381 households within Maiduguri metropolis using cluster sampling at ward level and systematic sampling within each ward. Interview was also conducted with key management staff of Borno State Water Board. Descriptive statistics was utilised in analysing the collected data and was presented in tables. The analysis revealed that, 53% of the households utilise pit latrines as their household sanitary facility. The majority, that is, 83% site their soak-aways on road setbacks. Only 7% of the household grey water is disposed into household soak-away, while the rest is disposed in earth dug pits or paved pits, open street and open drainages. The majority, that is, 64% of household black water is evacuated between 1 and 6 years interval. Evacuation services for black water is not affordable as agreed by 83% of the households while 67% of households black water is treated before evacuated from soak-aways. It was therefore recommended that, Maiduguri master plan should be reviewed to strengthen development control activities in order to curb hazardous development and mitigate siting of soak-aways on road setbacks, improve and initiate water projects and establish decentralised sewer systems at ward level for easy collection and management of both black and grey water from household activities.

1.0 INTRODUCTION

Waste water is domestic effluent consisting of blackwater (excreta, urine and faecal sludge) and greywater (kitchen and bathing wastewater), commercial, industrial and agricultural waste water [10]. Adequate waste water services, including safe disposal of sanitary waste (black water) and other waste water (grey water) disposal, are essential for ensuring the health and wellbeing of urban dwellers. Inadequate sanitation is a major cause of disease, and improvements in sanitation have been shown to have significant beneficial health impacts both in households and across communities.

Fewer than 35% of cities in low and middle-income countries have their wastewater treated [5]. Key challenges to effective waste water management include integrating the informal waste water sector in developing cities so as to enable inclusion and reducing generation and consumption in developed cities. Particularly in high-income countries, cities must strive to initiate harvesting of bio-energy from waste water and reuse of the end products for agricultural purposes towards achieving close to zero waste.

In 2010, an estimated 2.5 billion people worldwide lacked access to basic sanitation services [9]. Although limited data is available on the urban population, it is estimated that in 2000 at least 850 million lacked adequate sanitation [8]. Most cities and smaller urban centres in sub-Saharan Africa and many in Asia have no sewers, and in the ones that have, only a fraction of their population have access to it. Access to modern sanitary facilities in developing countries of Africa and Asia is a major challenge. Nigeria falls below the 63% Millennium Development Goal target for basic sanitation, rating her among the lowest in the world. This is as a result of irregular coverage, poor sector monitoring and accountability mechanisms, limited private participation, among others. This has made sanitation services a major challenge for Nigerian cities [11].

The WHO/UNICEF JMP [13] survey on access to modern toilet facilities in 15 Nigerian cities

reported that, from 2000 to 2015, only the city of Lagos, Owerri and Zaria experienced an increase in access; from 84.5%-86.6%, 79.2%-82.2% and 63.5%-82.5% respectively. All the rest experience a decline with Calabar being the worst, with a decline from 82.4%-39.4%. The city of Abuja being the capital and newest city in the country also declined from 83.1%-80.7%. Maiduguri is not far-fetched from this phenomenon, though its data was not captured. Lwasa [4], attributed these challenges to urbanisation, poverty and the inability to achieve sustainable development due to its multi-dimensional nature. Sanusi [7], on the other hand, attributed it to improper innovative spatial planning and policy failure. This study therefore, assesses access to waste water management services in Maiduguri. It investigates the types of sanitary facilities utilised, disposal methods for grey and black water, evacuation and affordability of services rendered.

2.0 STUDY AREA

Maiduguri is the oldest town in North Eastern Nigeria which is a creation of the British colonialists to serve as a new capital for the relic of the Kanem Borno Empire that came under their influence in the late nineteenth century. However, there were several small settlements nearby including one called Maiduguri which was in existence since early seventeenth century (Waziri 2009). It is located on latitude 11° 46'N, 11° 55'N and Longitude 13° 4'E, 13° 15'E. It rose to primacy due to it, being an administrative seat since colonial times and being a gateway to Niger, Chad and Cameroun republic. As the capital of Borno state from long till date, the city has continued to grow, with various ethnic group from within and outside the country. Spatially, Maiduguri lies in the Sudan-Sahel transition zone covering an area of about 15-18km long and 11-15km wide [1], [12]. Demographic studies of the area reveals that population of Maiduguri as 540,016, out of which 282,409 are males and 257,607 are females [6].

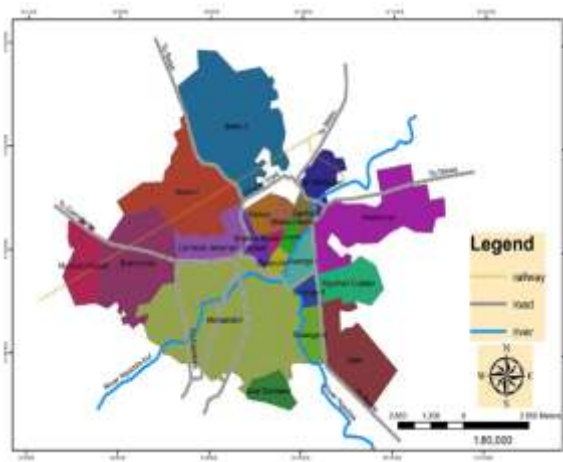


Fig 1: Wards of Maiduguri Metropolis (Source: [2])

3.0 MATERIALS AND METHODS

Questionnaires were administered to 381 households, drawn from the total of 56159 households of the metropolis [3]. The 381 questionnaires were administered to household heads in the 21 wards of Maiduguri metropolis using cluster sampling at city level, with each ward being a cluster, and systematic sampling at ward level to select individual households. In the absence of a male household head, it is administered to a female. Interviews was also conducted with key management staff of the Borno State Environmental Protection Agency (BOSEPA), responsible for waste water management in the city. The questionnaire was analysed using descriptive statistics to assess the level of access to waste water management service to households in Maiduguri.

4.0 RESULTS AND DISCUSSION

TABLE 1
Type of Sanitary Facility

Variable	Frequency	%
Water closet	179	47
Pit latrine	202	53
Total	381	100

Author's field work, 2016

Table 1 shows that, 53% of the households utilise pit latrine as their sanitary facility in their households, while only 47% utilise the water closet. This implies that, majority of the

households require less water for toilet facilities, which might be as a result of limited access. A considerable number also have toilet facilities that require a lot of water.

TABLE 2
Siting of Soak-away

Variable	Frequency	%
On road setback	318	83
Within compound	63	17
Total	381	100

Author's field work, 2016

Table 2 shows that, majority of the households, constituting 83%, site their soak-aways on the street setbacks. This area is the utility corridor for neighbourhoods and is a major problem when siting utilities like electricity, drainage, pipe borne water conduits and telephone cables. As a result, it is obvious that there is no centralised or decentralised sewer system for the town.



Plate 1: Soak-away Sited on Road Reserve in Bolori I Ward



Plate 2: Soak-away sited on road reserve in Gwange III Ward



Plate 3: Siting Soak-away on Road Reserve in Bolori II Ward



Plate 5: Paved pit for disposing grey water in Bolori II ward

TABLE 3
Method of Disposing Grey Water

Variable	Frequency	%
Soak-away	33	7
Street	45	12
Drainage	214	56
Others	89	25
Total	381	100

Author's field work, 2016

Table 3 shows that, 56% of the households dispose-off grey water into available neighbourhood drainages. 25% and 12% of household grey water are disposed into dug pit and on the open street respectively. Only a minimum 7% of household grey waste water is drained into soak-aways. This means only the 7% are likely to have their grey waste water evacuated by BOSEPA and have access to the services.



Plate 6: Grey water disposed in an open drain in Old Maiduguri ward



Plate 4: Dug pit for disposing grey water in Gamboru ward



Plate 7: Grey water disposed on the street in Mairi ward

TABLE 4

Interval of Evacuating Waste Water from Soak-away

Variable	Frequency	%
Less than 1year	6	2
1year – 3years	129	34
4years – 6years	116	30
7years – 9years	38	10
10years above	92	24
Total	381	100

Author's field work, 2016

Table 4 shows that, 64% of household sanitary waste is evacuate between 1 and 6 years, while just 2% is evacuate in less than a year. It takes between 7-9years for 10% of the households to evacuate their sanitary waste while it takes more than 10years for 24% to evacuate theirs. This shows that, 36% of the households evacuate their soak-aways in less than 4years as a result of high occupancy ratios. This can result to extreme health conditions, difficult for city authorities to tackle.

TABLE 5
Affordability of Evacuation Service

Variable	Frequency	%
Affordable	315	83
Not Affordable	66	27
Total	381	100

Author's field work 2016

Table 5 shows that 83% of the households agreed that, the sanitary waste evacuation services is affordable. This is because the Borno State Environmental Protection Agency (BOSEPA), charges between 3500 Naira to 4000 Naira depending on negotiation, "Confer and Langa Langa cleaning services" (private companies) charge 4000 Naira for just evacuation, and 4700 Naira for both treatment and evacuation. The other 27% cannot afford the cost. This means that 27% of households are likely not to request for the service have eventually reducing their access to it.

TABLE 6
Availability of Waste Water Treatment before Evacuation

Variable	Frequency	%
Treated	256	67
Not treated	125	33
Total	381	100

Author's field work, 2016

Table 6 shows that, 67% of the households agreed that the sanitary waste is treated before it is evacuated from soak-aways, while the other 33% said it is not treated. Treatment of waste water is part of the service rendered by BOSEPA, Langa Langa and Confer Cleaning Services. It involves, breaking the raw sewage down with chemicals before evacuation. Therefore, if the treatment of waste water is not available the access to the service is reduced compared to a respondent whose household waste water is treated.

5.0 CONCLUSION

There is no central system for collecting waste water; either black or grey water. Households utilise sanitary facilities with pit latrines being the majority other than the water closet that requires a lot of water, implying inadequate access to water. Grey water from bath/shower, household chores or other household activities are usually emptied on the street or available drains. Soak-aways are sited and Pits are dug in front on road setbacks on the street, to collect grey water which creates breeding grounds for disease vectors. Considering the affordable evacuation services rendered by BOSEPA, Langa Langa and Confer cleaning services, which is usually treated before removal, most people evacuate their household sanitary waste at an interval of between 1 to 6 years.

6.0 RECOMMENDATIONS

- i. The Maiduguri master plan prepared by Maxlock Group in 1976, and became operational in 1977 has never been reviewed. The master plan should therefore, be reviewed to checkmate the outcrop of haphazard development in the town; ensuring a well designated utility corridor for easy provision, installation and maintenance. This will also serve as a tool to fortify development control activities, which will be used to mitigate frequent siting of soak-aways on road setbacks, on the street, to mitigate challenges of siting utilities and road infrastructures.
- ii. Water projects should be initiated with the upgrade of old conduits and the installation of new ones in areas not under coverage such as the entire Bolori II ward.
- iii. A decentralised sewer system should be constructed for each ward to take care of waste water constituting both black water from toilets and grey water from household and environmental activities. It will be easily managed at that level giving household a better access to the service.

- [6] National Population Commission (NPC) (2009). *Federal Republic of Nigeria Official Gazette*. No. 2 Vol. 96. A Legal Notice on Publication of 2006 Census Final result, Abuja Nigeria.
- [7] Sanusi, Y. (2011). *Innovative Spatial Planning in Mitigating Climate Change Related Vulnerability in Nigerian Urban Centres*. In Real Corp Proceedings. Manfred, S., Vasily V. P. and Peter Z. (Eds) (pp.459–471). Essen: Tagungsband.
- [8] UN-Habitat (2003). *Slums of the World: The Phase of Urban Poverty in the New Millennium? Monitoring the Millennium Development Goal, Target 11-World-wide Slum Dweller Estimation*. Working Paper. UN-Habitat, Nairobi.
- [9] UNICEF and WHO (2012). *Progress on Drinking Water and Sanitation Update*. Retrieved from www.who.int/watersanitationhealth/publications/2012/jmpreport/en/index.html
- [10] UN-Water (2015). *Waste Water Management*. A UN-Water Analytical Brief.
- [11] Water and Sanitation Monitoring Platform (WSMP) (2008). *Water and Sanitation Summary Report*. Country Summary Sheet 2008
- [12] Waziri, M. (2009). *Spatial Pattern of Maiduguri City: Researchers' Guide*. Adamu Joji Publishers, Kano City.
- [13] WHO/UNICEF Joint Monitoring Programme, (2014). *Progress on Sanitation and Drinking Water: 2014 Update and MDG Assessment*. Joint Monitoring Programme for water and Sanitation 2014 Report. WHO press, Geneva.

REFERENCE

- [1] Daura, M. M. (2001). *The Physical Environment and Development: A Study of Borno Region in Ogunnika, O., Irefin, D., Daura, M. M. and Balami, D. (eds) Environment and Development Issues in Sub-Saharan Africa. Seminar Series of Social and Management Science*. University of Maiduguri (pp.35-47).
- [2] Kawka, R. (2002). *The Physiognomic Structure of Maiduguri*. in Kawka, R. (ed) *From Bulamari to Yerwa to Metropolitan Maiduguri*. Rudiger Koppe Verlag, Kohn
- [3] Krejcie R. V. and Morgan D. W. (1970). *Determining Sample Size for Research Activities*. Educational and Psychological Measurement 1970, 30, 607-610.
- [4] Lwasa, S. (2014). *Managing African Urbanization in the Context of Environmental Change States*. Interdisciplina Vol. 2, No. 2 (2014): 263-280.
- [5] Mara, D. (2012). *Sanitation: What's the Real Problem? IDS Bulletin*, Vol. 43 No.2, (pp.86-92).