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# Inequalities in Households' Environmental Sanitation Practices in a Developing Nation's City: The Example of Ile-Ife, Nigeria

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## Abstract

A new global movement that emerged as a post 2015 development agenda is the sustainable development goals (SDGs). While the central objective of SDGs is to end poverty in all its forms, focus on water and sanitation rested on the fundamental concern for equity; moving from just service delivery to service delivery for all. Hence, the study reported in this chapter was set to examine the state of households' environmental sanitation practices in different residential areas of Ile-Ife, Nigeria. A three-stage multi-sampling procedure was adopted in selecting 283 households' heads for survey. Findings of study showed that 23.6, 41.2, and 68.4% of households in the core, transition, and sub-urban residential areas of Ile-Ife, respectively, have source of water within their residential building. Study established that households' toilet facilities differ significantly in the study area, as respondents socio-economic characteristics varied across the identified residential areas of Ile-Ife. The study thus posited that, if cities in Nigeria and other developing nations will keep tract with timelines of the SDGs on water and sanitation, drastic, and realistic steps must be taken in addressing identified inequalities. This is a way to guaranty adequate hygiene and improved quality of life.

**Keywords:** households sanitation, environmental sanitation practices, hygiene, developing nation, inequalities

## 1. Introduction

There is a close relationship between man and the environment. It is essential for man to among other things, understands his environment, protects it, conquers, and harnesses it to his ultimate benefit. These are very important as the environment is a complex Web that connects man with the place he lives in; including the natural world as well as things he produces [1]. The environment is a system within which living organism interacts with the physical elements [2, 3]. As the environment constitutes an important factor in the lives of man, its continuous use and misuse have raised globally, concern about possible consequences. These consequences as opined by Taiwo [4] are complex, multi-dimensional, interactive and

cross-sectoral, and hence require inter-organizational collaborations. The coming together of 189 countries of the world in an attempt to face the future, leading to the emergence of the millennium development goals (MDGs), with a target date of 2015 [5] is one of the collaborative efforts to save the environment, and its inhabitants from many mishaps. The significance of the environment to healthy living, national growth, and stability cannot be underestimated. Indeed, almost all indicators of development in the MDGs can be linked to the environment [5].

Among many other fundamental pillars of development entrenched in the MDGs, were water and sanitation, with focus on service delivery. There are several reports on the success and failure rates of MDGs implementation from different countries of the world. Among these are [6–8]. A progress report of the MDGs for Nigeria by United Nations indicated that by 2008, the proportion of households that have access to improved water and sanitation were, respectively, 48 and 53% [9]. More specific and prior to the release of United Nations report [6], it was established that in Lagos State, 36% of households have access to portable water [9]. The report further showed that only 7% of households in the state have access to closet septic tanks. As documented in many MDGs progress reports on water and sanitation in Nigeria, efforts have been devoted to service delivery at the household levels. It is important, however, to examine if there are disparities in the delivery of water and sanitation services, across different residential areas of typical Nigerian city.

To build on many successes of the MDGs, a new global movement that emerged as a post-2015 development agenda is the sustainable development goals (SDGs) [10]. While the central objective of the SDGs is to end poverty in all its forms, focus on water and sanitation rested on the fundamental concern for equity; moving from just service delivery to service delivery for all. Goal six of the SDGs, which is to ensure availability and sustainable management of water and sanitation for all [10, 11], is very central to environmental sanitation and more importantly, developmental activity. The need for an equitable environmental sanitation service delivery cannot be overemphasized. In fact, the attainment of other SDGs, such as Goals 2, 3, 5, 10, and 11 cannot be separated from equitable water and sanitation service delivery. Although the SDG is new, with a target date of 2030, it is imperative to document the level of (in) equalities that exists in environmental sanitation practices at the household and residential neighborhood levels, especially in a developing nation's city. As documented by Osborn, Cutter, Ullah [11], in most developed countries, almost everyone has access to water and sanitation services. There is need to unmask, reduce, and eliminate inequalities in households' sanitation practices in developing nations as well. A way to start these is to first understand the state of environmental sanitation practices in and among different residential areas, social, and income groups.

Environmental sanitation has come to the fore in many developmental discusses, however, with varied definitions. According to [12], environmental sanitation is the sum total of activities embarked upon to protect human bodies from illness, transmission of diseases, or loss of life due to the unclean surrounding. It entails the safe management of human excreta, environmental cleanliness, hand-washing, garbage removal, and wastewater disposal [13, 14]. From these definitions and others [15, 16], environmental sanitation can be construed as comprising, among others; water supply, solid waste management, waste and stormwater management, toilet facilities, and hand-washing. In other words, environmental sanitation entails principles of effecting healthful and hygienic conditions in promoting public health and welfare. Environmental sanitation has input in the various area of health, social balance, urban stability, economic growth and development, and as well as hygiene [17–19]. The social, economic, and environmental health costs of ignoring adequate and effective sanitation (including hygiene) are far too great [20, 21]. Lack of sanitation facilities and poor hygiene are sources of water-borne diseases, such as

diarrhea, cholera, typhoid, and several parasitic infections. The incidence of round worm, whip worm, guinea worm, and schistosomiasis are also linked to poor sanitation. Preventable diseases associated with lack of access to potable water, inadequate sanitation, and poor hygiene have been identified as the source of death of more than 2.2 million people in developing countries [22]. As opined by Daramola, Olowoporoku, and Popoola [23], the consequences of inadequate water supply and sanitation in cities of sub-Saharan Africa are worse than the claws of a tiger.

It is unarguable that environmental sanitation practices differ both in the developed and developing nations of the world. In a study by Faniran, Afon, and Dada [24], it was established that, while there was variation in residents' age, income and education statuses, methods adopted in solid waste storage and disposal by residents across the different residential zones of Ibadan, were not different. Although efforts in [24] was on solid waste management (a fraction of sanitation), it is hypothesized that differences in households' socio-economic characteristics, as well as residential areas, account for disparities in sanitation practices at the household level. In other words, there is a need for an in-depth understanding of existing households' sanitation situation in developing nation's city, with specific attention on water and toilet facilities. The purpose of the study reported in this chapter, is therefore, to examine the state of households' environmental sanitation practices in different residential areas of a typical Nigerian city, Ile-Ife.

## **2. Material and methods**

The study area, Ile-Ife, is an ancient city in Osun State, Nigeria. It is located approximately between latitude 7°28' and 7°45' North and Longitude 4°30' and 4°34' East of the equator. It is 218 km North East of Lagos. Administratively, the city is made up of two local government areas (LGAs): Ife Central and Ife East. There are, respectively, 11 and 10 political wards in the two identified LGAs [25]. These two LGAs cover an approximately 1,791 km<sup>2</sup> area of land. According to National Population Commission [26], the population of Ile-Ife was 355,281 by the year 2006. Ile-Ife is widely acknowledged as the cradle of the Yoruba race, whose existence predates Nigeria British colonialism. Yoruba is an ethnic group and the predominant in Southwestern Nigeria. They are also found in other places in the country and across the globe.

The formation of the different residential settings of many Nigerian cities can be traced to different historical backgrounds [27–29, 24]. These are the pre-colonial (traditional), colonial (non-traditional) and the post-independence (modern) periods. Ile-Ife is not an exemption. Although the classification of [30], indicate the existence of a fourth residential zone in Ile-Ife, termed the post-conflict area, which emerged as a result of communal clashes in the city. Personal observation shows that the once war wreaked area is fast becoming desolate. It is, therefore, important to note that, the inclusion of this fourth zone as the residential area is often adopted in discussing crime-related issues. Residential areas that emerged during each of the earlier mentioned three periods are, respectively, referred to as the core, the transition, and the sub-urban [27–29, 24]. In some other studies [31, 32], the core is regarded as high-density residential area, while the transition and the sub-urban are referred to as the medium and low-density residential areas, respectively. Each of these residential areas is distinctively homogeneous, with respect to physical layout, housing characteristics, environmental qualities, population per square kilometer, and residents' socio-economic statuses. It is, therefore, posited that along with these identified distinctive residential areas, households' sanitation practices will also differ significantly in the study area.



In order to achieve the purpose of this study, data were collected from selected households in Ile-Ife through questionnaire administration, during the months of November and December, 2017. To select sample for the study, a three-stage multi-sampling procedure was adopted. As earlier mentioned, there were 21 political wards in the two LGAs of the study area: 11 in Ife-Central and 10 in Ife East. Identified political wards were re-grouped into the three different residential areas using stratified sampling technique. Nine of these 21 political wards were located in the core, while there were six in each of the transition and the sub-urban. Simple random sampling technique was used in the second stage in selecting one out of every three political wards in each residential stratum. In other words, seven political wards were selected for the purpose of questionnaire administration. Respondents were drawn from 10% of residential buildings in the selected political wards, using systematic sampling techniques.

In the selected residential building, a questionnaire was administered on a resident who is 18 years old and above. This was adopted, bearing in mind that an individual at this stage in life is no longer a minor; hence could sue or be sued. Similarly, a female respondent was preferred for questionnaire administration in each selected residential building. The allusion to this from the oral commentary is the fact that, among the Yoruba, females were considered as handlers of domestic chores; including household needs of water and sanitation. The practice is that, as soon as a girl child advances in age, she should know how to assist the mother; sweep and clean the house, takes care of the bathroom and toilets, washcloths and cook. The male child is most time spared from all these domestic chores; rather he goes to the farm or another profession with the father. In fact, sanitation was a reserved responsibility of the female folks.

Using the multi-stage sampling technique, 283 respondents were selected for questionnaire administration. Information collected from respondents was their socio-economic characteristics, household's access to water, availability of toilet facility, and methods of solid waste storage and disposal. Information collected from respondents was analyzed using SPSS 17 software. Frequencies of responses were compute, cross-tabbed and expressed in percentages. Responses were also presented in tables and figures. Chi-Square Analysis ( $\chi^2$ ) and Analysis of Variance (F) were also used for data analysis at 95% level of confidence ( $\alpha = 0.005$ ).

### **3. Findings of study**

Presented in this section are respondents' socio-economic characteristics and sanitation practices. More specifically, issues discussed in sub-section two covered households' access to water supply, toilet facility, solid waste storage, and disposal methods.

#### **3.1 Respondents' socio-economic characteristics**

Socio-economic characteristics of respondents examined in this study were: age, gender, educational qualification, income, and household size. Studies [23, 24, 29, 33, 34] have established the significance of these five characteristics in environmental-related issues; more importantly, when it is about water and sanitation. In other words, these variables will modulate positively or negatively, households' sanitation practices.

The gender distribution of respondents across the three residential areas of Ile-Ife is presented in **Table 1**. Evidence abounds that the proportion of female that

participated in the study was more than the male counterpart. It is instructive to note that, this does not suggest that there were more female household heads in the study area than the male household heads. Rather, it is a reflection of the consideration given to the female in the selection of respondents. Of the 283 respondents, 37.1% were male while 62.9% were female. Impliedly, those who were traditionally in the position of handling environmental sanitation and have greater sensitivity toward environmental issue as opined by Zelezny [35] were fully involved in the study. Across the three identified residential areas of Ile-Ife, the female accounted for 63.0, 60.0, and 65.8% of respondents in the core, transition, and sub-urban areas, respectively. Further analysis ( $\chi^2 = 0.561, p = 0.756$ ) confirmed that there was no significant difference in gender distribution of respondents across residential areas of Ile-Ife.

For the purpose of this study, respondents' age was classified into three following the taxonomy of [36]. The groups were: 19–30 years (the youths), 31–55 years (the young adults), and 56–65 (the adults). The grouping was adapted to aid understanding. The study showed that 42.8% of respondents were young adults. On the other hand, the youth and the adult, respectively, accounted for 18.0–39.2% of respondents. As presented in **Table 1**, it is clear that as distance increase from

Residents' Characteristics	Core Frequency (%)	Transition Frequency (%)	Sub-urban Frequency (%)	Total (%)
<b>Gender</b>				
Male	47 (37.0)	32 (40.0)	26 (34.2)	105 (37.1)
Female	80 (63.0)	48 (60.0)	50 (65.8)	178 (62.9)
<b>Age</b>				
19–30	8 (6.3)	19 (23.7)	21 (27.6)	48 (17.0)
31–55	32 (25.2)	45 (56.3)	47 (61.8)	124 (43.8)
56–70	87 (68.5)	16 (20.0)	8 (10.5)	111 (39.2)
<b>Education status</b>				
No formal education	55 (43.3)	19 (23.8)	12 (15.8)	86 (30.4)
Primary	17 (13.4)	3 (3.7)	3 (4.0)	23 (8.1)
Secondary	30 (23.6)	20 (25.0)	9 (11.8)	59 (20.8)
Tertiary	25 (19.7)	38 (47.5)	52 (68.4)	115 (40.6)
<b>Income status (₦*)</b>				
Below 30000.00	67 (52.8)	38 (47.5)	29 (38.2)	134 (47.3)
30000.00–60000.00	39 (30.7)	25 (31.3)	16 (21.0)	80 (28.3)
Above 60000.00	21 (16.5)	17 (21.2)	31 (40.8)	69 (24.4)
<b>Household size</b>				
1–6	12 (9.4)	39 (48.8)	58 (76.3)	109 (38.5)
6–10	77 (60.6)	37 (46.2)	13 (17.1)	127 (44.9)
Above 10	38 (30.0)	4 (5.0)	5 (6.6)	47 (16.6)
N	127	80	76	283

*\*Naira is Nigeria currency and is denoted by ₦ (USD \$1 = ₦ 360 as at 7th December, 2017).*

**Table 1.**  
*Socio-economic characteristics of respondents in different areas of Ile-Ife.*

the core toward the sub-urban, the proportion of respondent in the youth and the young adult also increased. Whereas, the proportion of respondent who was adults, reduced as distance increased from the core to the sub-urban. The minimum age was 24 years and the maximum was 62 years. The mean age and standard deviation for the study were 47.8 –9.7 years, respectively. The mean age of residents in the core was 52 years, while that of the transition and sub-urban were 45–42 years, respectively. The standard deviation was 9.7. Differences in the age of respondents across the three residential areas were found to be statistically significant. The result of analysis of variance ( $F = 36.126$  and  $p = 0.000$ ) confirmed this. Impliedly, there is variation in the age of residents in the three identified residential areas of Ibadan metropolis.

A total of 197 (69.6%) of the respondents had one form of formal education or the other. As presented in **Table 2**, 8.1, 20.8, and 40.6% of household heads sampled had primary, secondary and tertiary education qualification, respectively. The highest proportion of respondents with tertiary education qualification was in the sub-urban residential area (68.4%). This group of respondents accounted for 19.7% of residents in the core area, 47.5 and 68.4% of respondents in the transition, and sub-urban areas, respectively. Respondents with no formal education were 86 (30.4%) of sampled household heads in Ile-Ife; however, 64.0, 22.1, and 13.9% of residents in the core, transition, and sub-urban residential areas where in this category. In other words, respondents without formal educational background were predominant in the core area. It can be inferred that there was a direct variation between the educational status of residents and increase in distance from the core toward the sub-urban. This finding validated the description of [37, 38] that core residential areas of many Nigerian cities are habited by people with the least formal education qualification. Chi-square test computed ( $\chi^2 = 54.477$  and  $p = 0.000$ ) also established that there was significant variation in educational status of respondents across residential areas of Ile-Ife.

Respondents' monthly income was grouped into three: low-, medium-, and high-income earners. Respondents who earned below ₦20000.00 were classified as low-income group and accounted for 47.3% of sampled household heads. On the other hand, respondents who earned between ₦20000.00 and ₦60000.00 were the medium income earner, while individuals who earned above ₦60000.00 are the high-income earners. The medium and high-income earners represented 28.3 and 24.4% of respondents, respectively. As presented in **Table 1**, the proportion of respondents in the high-income group increased from the core residential area toward the sub-urban. This pattern was based on the fact that 16.5, 21.2, and 40.8% of the respondents in the core, transition, and sub-urban residential areas, respectively, were high-income earners. Mean income of respondents in the study area was ₦29929.75 and the standard deviation was ₦14372.46. Across the three identified residential areas of Ile-Ife, however, the mean income of respondents differed: while it was ₦18647.32 in the core area, ₦41515.38 in the transition, and it was ₦37784.61 in the sub-urban. Further, One-way analysis of variance test established that there was a significant difference in monthly income of respondents in the study area ( $F = 141.528$ ,  $p = 0.000$ ).

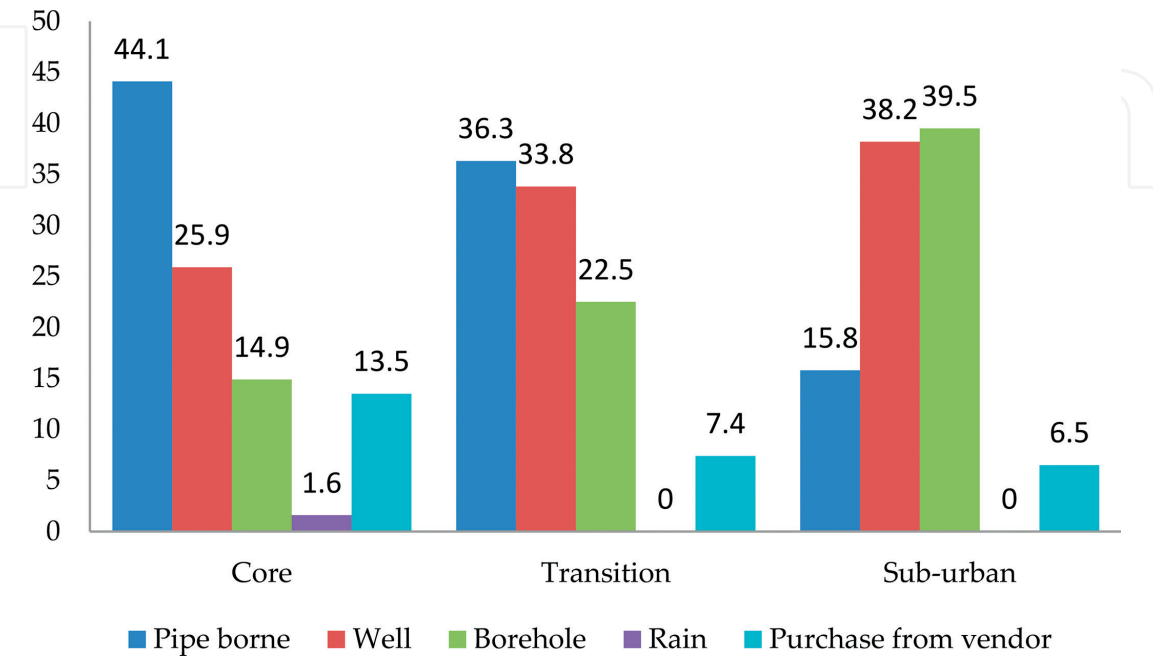
Household size of respondents was expressed as the number of people or group of people living together under the same roof and eats from the same pot. It is important to add that member of a household share the use of water and another sanitary arrangement. Although in some instances where multi-habitation is prominent, such as the core area [39], sanitary facilities could be shared by more than a household. Respondents household size was thus categorized into small (1–6 people), medium (6–10 people) as well as large (above 10). Households that could be termed small accounted for 9.4% in the core, 48.8% in the transition, and 76.3% in the sub-urban. Evidently, respondents household size varied as residential areas also differed ( $F = 142.471$ ,  $p = 0.000$ ).

From the above, it is clear that with the exception of respondents' gender distribution, which is not significantly different across the three residential areas of Ile-Ife, other socio-economic characteristics varied as residential areas also varied. This tends to suggest that there will be a disparity in households' access to water and sanitation facilities in the different residential areas of Ile-Ife. The following sub-section is therefore devoted to examining the level of equality that exists in households' access to water and sanitation as well as sanitation practices in the study area.

**3.2 Households' sanitation practices in Ile-Ife**

As shown in **Figure 1**, five sources of water to the households were identified in the study. These were: pipe-borne, well, borehole, rain, and purchase from water vendors. Findings of the study showed that in the core residential area, 44.1% of households have access to pipe-borne water source. Households that sourced water from pipe-borne accounted for 36.3 and 15.8% of households in the transition, and sub-urban areas, respectively. It should be noted here that, the proportion of households that sourced water from the pipe-borne decreased as distance increased from the core to the sub-urban area. The pipe-borne water source is provided as a public service by the government. The study established that while the distance was increasing from the core to the sub-urban, the proportion of household that have access to well water and borehole were also increasing. Rainwater was not a common source in the study area, as only 1.6% of households in the core residential area, representing 0.7% of households in Ile-Ife get water from this source. As earlier stated, this study was conducted in the months of November and December, 2017. These months are regarded as dry/harmattan season in Nigeria. The activity of water vendor was thus prominent in the core area than the other two residential areas. This is despite the fact that households in the core have access to public water supply. This, signals among other things, that households augment the public water supply, which has become epileptic with other sources.

Further inquiry into household access to water showed that sources of water were at different locations. Three major locations were identified (see **Table 2**).



**Figure 1.**  
*Sources of water supply to households within Ile-Ife.*



Location of water source	Core frequency (%)	Transition frequency (%)	Sub-urban frequency (%)	Total (%)
Within building	30 (23.6)	33 (41.2)	52 (68.4)	115 (40.6)
In neighborhood	42 (37.0)	21 (26.3)	26 (34.2)	79 (27.9)
Outside				
Neighborhood	55 (63.0)	26 (32.5)	50 (65.8)	89 (31.5)
Total	127 (100.0)	80 (100.0)	76 (100.0)	283 (100.0)

**Table 2.**  
*Location of water source in different residential areas of Ile-Ife.*

These were within respondent’s residential building, outside the residential building in the neighborhood and outside the neighborhood. Only 115 (40.6%) of households have a water source within their building. Of the 115 households with water source within the building, 52 (45.2%) were in the sub-urban. Households that sourced water from outside their neighborhoods in the study area were 89 (31.5%). Analysis of this figure revealed that 61.8, 29.2, and 9.0% were respectively from the core, transition, and the sub-urban areas. Further investigation revealed that it takes residents a minimum distance range of about 250 m–500 m to travel and source water outside their place of residence. It is thus established that while a considerable proportion of households in the sub-urban area do not travel a long-distance before getting water, result suggests that large proportion of households in the core travel as far as half of a kilometer to source water. It could also be established that households’ distances to water source varied with the residential area.

Households’ access to toilet facilities was also investigated. In residential areas selected for study, 190 (67.1%) households have toilet facilities. The distribution of responses, however, showed that 51.2% of households in the core, 67.5% in the transition, and 93.4% in the sub-urban residential areas have access to toilet facilities. In other words, the proportion of residents in the study area without access to toilet facilities will employ other methods of defecating such as the use of the open area, near-by bush, and other unfriendly environmental practices. The use of each of these environmentally unfriendly methods has implications for healthy living. These methods are capable of breeding flies and vermin. In areas where the methods are used, an outbreak of diseases and epidemic cannot be negotiated.

In the 190 households where residents have access to toilet facilities, types of toilet used were the flush (62.6%), ventilated improved pit (8.4%), and pit latrine with slab (28.9%). Types of toilet used in the study area also varied with the residential area. The use of flush toilet increased with distance increase from the core to the sub-urban. On the other hand, however, the use of pit latrine was inversely proportional to increase in distance from the core to the sub-urban. Indeed, in the core residential area only, households, where pit latrines were used, accounted for 69.1% of all households that used pit latrine in the study area. In contrast, 88.7% of households that used flush toilet were located in the sub-urban residential area of Ile-Ife. Looking at this information, it could be suggested among other things that a household’s choice of type of toilet is influenced by age, educational status, and income of household head, as well as the location of residence in the city.

Across residential areas of Ile-Ife, different methods of solid waste storage and disposal were employed by respondents’ households. Among the materials used for storing waste were polythene bag, sack, paper carton, local basket, and bucket with cover as well as without cover. Households also employed different methods for the disposal of waste generated. Dumping inside the drain, along the road,

uncompleted building, burying, burning, and the use of designated point in the residential area where the various methods employed in the disposal of solid waste in Ile-Ife. The investigation also revealed that residents dispose waste into skip-eater provided by the government. Although this arrangement is not evident in the suburban area of the city, many of the facilities for disposal provided by the government were concentrated in the core and transition residential areas. The initiative of the paramount ruler of the town is also noticed in solid waste management. Respondent gave an account of the emergence of *gba'fe mo* (Sweep Ife Clean) that was launched by the *Ooni of Ife* in the year 2016. Across the different residential area of the city, there was a disparity in households' accessibility to facilities provided.

#### 4. Conclusions

This study established among other things that there were significant differences in respondents' socio-economic characteristics across the different residential areas of Ile-Ife. Similarly, there were differences in household's access to water and toilet facilities. These differences have impacted greatly households' sanitation practices. Inequalities in households' income and access to education identified in this study are a potential clogs in the wheel of attaining the SDGs in a typical developing nation's city. There is need, therefore, to develop policies that create an opportunity for all. This is irrespective of who you are, where you reside or come from. There is a need for an improved financial institution, regulation, and market to cater for identified inequalities. Disparities in households' sanitation practices across different residential areas also call for support and development aid where they are most needed, especially among the low-income earners in developing nations. The old direction of households' sanitation must be improved, if developing nations will keep track with the post-2015 development agenda.

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## References

- [1] Arms K. Environmental Science. Austin, Texas: Holt, Rinehart and Winston; 2008
- [2] Wimelius H. Fundamentals of user perception and interaction: Environmental psychology applied in a study of web pages. *Psychology Journal*. 2004;2(3):282-303
- [3] Heinke GW. The nature and scope of environmental problem. In: Henry JG, Heinke GW, editors. *Environmental Science and Engineering*. 2nd ed. New Delhi: Prentice Hall of India; 2005. pp. 1-3
- [4] Taiwo DS. Identification of urban environmental issues and involvement of stakeholders in issue, assessment and priority setting. In: Agbola T, editor. *Environmental Planning and Management: Concepts and Application to Nigeria*. Ibadan: Counstellation Books; 2006. pp. 10-16
- [5] United Nations. Official List of Millennium Development Goal Indicators. 2008. Available from: <http://mdgs.un.org/unsd/mdg/Host.aspx?Content=indicators/officiallist.htm> [Accessed: December 18, 2017]
- [6] United Nation. World Population Prospects: The 2008 Revision. New York: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat; 2009
- [7] Mosello B. How to Reduce Inequalities in Access to WASH—Rural Water and Sanitation in Ghana. Report from Overseas Development Institute, WaterAid. 2017. Available from: <https://www.odi.org/sites/odi.org.uk/files/resourcedocuments/11606.pdf> [Accessed: January 15, 2018]
- [8] World Bank. Reducing Inequalities in Water Supply, Sanitation, and Hygiene in the Era of the Sustainable Development Goals: Synthesis Report of the Water Supply, Sanitation, and Hygiene (WASH) Poverty Diagnostic Initiative Report from World Bank. 2017 Available from: <https://openknowledge.worldbank.org/handle/10986/27831> [Accessed: January 15, 2018]
- [9] Lagos State Government. Nigeria. Lagos State Economic Empowerment and Development Strategy (LASEED). Alawusa-Ikeja: Lagos State Government; 2005
- [10] Government of the Federal Republic of Nigeria. Sustainable Development Goals (SDGs) Indicators Baseline Report. Abuja: National Bureau of Statistics; 2016
- [11] Osborn D, Cutter A, Ullah F. Universal Sustainable Development Goals: Understanding the Transformational Challenge for Developed Countries. Report of a Study by Stakeholder Forum; 2015
- [12] Rochester RC. Towards Effective Environmental and Town Planning Policies for Delta State, Nigeria. 2005. Available from: <http://www.urmcrochester.edu> [Accessed: January 14, 2018]
- [13] Mazubane C, Brisley M. White Paper on Basic Household Sanitation. 2002. Pretoria. pp. 1-16
- [14] Protos Uganda. Preliminary Literature Study to a School Sanitation and Hygiene Strategy. 2005. Available from: <http://www.protos.be> [Accessed: January 14, 2018]
- [15] Park JE. Preventive and Social Medicine. 21st ed. India: Bhanot Publishers; 2011
- [16] Henewa RA, Kolawole R, Ameyaw Y. Impact of environmental education

on sanitation practices in some selected schools in the new Juaben municipality, eastern region of Ghana. *International Journal of Advanced Biological Research*. 2014;4(2):228-234

[17] Vaz L, Jha P. Notes on the Health Impact of Water and Sanitation Services. CMH (Commission Macroeconomics and Health) Working Paper Series. Paper No. WGS 21.2001. Available from: <http://www.whoindia.org/linkfiles/commission-on-macroeconomic-and-health-105-21.pdf> [Accessed: January 14, 2011]

[18] Eawag: Swiss Federal Institute of Aquatic Science and Technology. Household Centred Environmental Sanitation: Implementing the Bellagio Principles in Urban Environmental Sanitation. Provisional Guideline for Decision-Makers. Duebendorf, Switzerland: Swiss Federal Institute of Aquatic Science and Technology, Water Supply and Sanitation Collaborative Council; 2005

[19] Robinson A. Universal Sanitation in East Asia: Mission Possible? Background Document and Thought Piece for the 1st East Asia Ministerial Conference on Sanitation and Hygiene; 2007. Bappu City: Japan

[20] World Health Organization (WHO). Water Supply and Sanitation Collaborative Council: Sanitation and Hygiene Promotion Guide. Switzerland: WHO; 2005

[21] Acheampong PT. Environmental sanitation in the Kumasi metropolitan area [thesis]. Kumasi: Kwame Nkrumah University of Science and Technology; 2010

[22] World Health Organization (WHO). Strengthening Interventions to Reduce Helminthes Infections: An Entry Point for the Development of Health-Promoting Schools. Geneva: WHO; 1997

[23] Daramola O, Olowoporoku O, Popoola A. Worse than a tiger's grip: The case of household water supply and sanitation practices in Osogbo Nigeria. In: Daniels JA, editor. *Advances in Environmental Research*. Vol. 55. New York: Nova Science Publishers, Inc; 2017. pp. 153-170. ISBN: 978-1-53610-888-0

[24] Faniran GB, Afon AO, Dada OT. Solid waste management during monthly environmental sanitation exercise in Ibadan municipality Nigeria. *Management of Environmental Quality: An International Journal*. 2017;28(6): 868-878. DOI: 10.1108/MEQ-03-2016-0030

[25] Independent National Electoral Commission. Polling Units. 2016. Available from: [http://inecnigeria.org/?page\\_id=20](http://inecnigeria.org/?page_id=20)

[26] National Population Commission. Population and Housing Census of the Federal Republic of Nigeria. Housing Characteristics and Amenities Priority Tables. Vol. 11. 2010. Abuja: Government Press; 2006

[27] Mabogunje AL. The growth of residential districts in Ibadan. *Geographical Review*. 1968;52(1):56-77

[28] Onokerhoraye AG, Omuta GED. Residential Areas of the City. The Geography and Planning Series. Benin: University of Benin Nigeria. pp. 651-657

[29] Afon AO. An analysis of solid waste generation in a traditional African city: The example of Ogbomoso, Nigeria. *Environment and Urbanization*. 2007;19(2):527-538

[30] Badiora AI, Afon AO. Spatial pattern of crime in Nigerian traditional city: The Ile-Ife experience. *International Journal of Criminology and Sociological Theory*. 2013;6(3):15-28



- [31] Adigun FO, Adedibu AA. Correlates of residents' response to crime in Nigerian cities. *Global Journal of Human Social Science*. 2013;13(5):39-50. Online ISSN: 2249-460x & Print ISSN: 0975-587X
- [32] Wojuade CA. Evaluation of accessibility of socio-economic facilities to residents in Ibadan, Nigeria [thesis]. Ile-Ife, Nigeria: Obafemi Awolowo University; 2012
- [33] Akpabio EM. Water meanings, sanitation practices and hygiene behaviours in the cultural mirror: A perspective from Nigeria. *Journal of Water, Sanitation and Hygiene for Development*. 2012;2(3):168-181
- [34] Tezera BS. Development impacts of poor accessibility of potable water supply and basic sanitation in rural Ethiopia: A case study of Soddo District water supply and sanitation [thesis]. Agder, Ethiopia: University of Agder; 2011
- [35] Zelezny LC, Chua PP, Aldrich C. Elaborating on gender differences in environmentalism. *Journal of Social Issues*. 2000;56:443-457
- [36] World Health Organisation (WHO). Definition of an Older or Elderly Person. Proposed Working Definition of an Older Person in Africa for the Millennium Development Goal Strategy Project. Geneva, Switzerland: WHO Regional Office; 2011
- [37] Eno O. Tenants' willingness to pay for better housing in targeted core area neighbourhoods in Akure Nigeria. *Habitat International*. 2004;2(3):317-332
- [38] Lawoyin TO, Lawoyin OOC, Adewole DA. Men's perception of maternal mortality in Nigeria. *Journal of Public Health Policy*. 2007;28:299-318
- [39] Okeyinka YR. Multi-habitation in Ogbomoso, Nigeria [thesis]. Ile-Ife, Nigeria: Obafemi Awolowo University; 2016