Rationalizing The Irrationality Of Open Defecation Practice Among Households With Toilets In Ogun State, Nigeria

Olapeju Olasunkanmi Olusola

M. Rafee Majid, PhD

Department of Urban and Regional Planning, Universiti Teknologi Malaysia,
Johor Bahru, MALAYSIA

Abstract: Various studies aimed at unravelling the practice of open defecation, the world over, establish lack of toilets as being the major factor responsible for open defecation. However, the reality in most countries like Nigeria where open defecation is still in practice is the fact that people who have toilets in their homes are not precluded from the terrible sanitation culture. The paper is therefore an attempt to investigate latent factors that account for the seeming irrationality of seeking recourse to open defecation when toilets are available. The study is limited to Ogun State, one of the 36 states of Nigeria. Using the multi-stage approach, a total of 165 questionnaires were administered to representative households in the study area. Study founds, among others, that HIEDQU (2), HIEDQU (4)(The dummies of the categorical variables of the highest education attained by respondents), and NRODHT(Neatness of Toilets as the reason households defecate in the open) at significance levels of 0.016, 0.011, 0.10, were the only significant predictors in the logistic regression model. The paper concludes that toilet provisioning without the adoption of holistic infrastructural framework and policy enforcement would not suffice in the quest to eradicating open defecation.

Keywords: Open- Enforcement, Factors, Infrastructure, Nigeria, Open-Defecation, Toilets.

I. INTRODUCTION

Sub-Saharan Africa accounts for 16 of the 24 countries where at least one person in five cannot access improved sanitation services. In these countries, the proportion of population sharing facilities is larger in the cities (WHO, 2017). WaterAid (2016) had ranked Nigeria as the sixth worst of the most people defecating in the open, with the average number of people defecating(46,017,300) in its land mass of 923,770 square kilometres, put at 50 per square kilometer. This is consistent with the 2017 findings of Joint Monitoring Programme — a body set up by UNICEF and the World Health Organization as reported in Thisday (2017) that 33% of people in Nigeria do not have clean water, 67% do not have a decent toilet and 26% practice open defecation. As reported in Dailytrust (2017), Nigeria loses over 3 billion dollars to poor sanitation. This fact is corroborated by World Bank (2012) that persons practicing open defecation expend practically 2.5 days a year finding a private location to

defecate, leading to huge economic losses and production of unhealthy flies and pathogens. Diarrhoeal diseases related deaths in Nigeria reached 130,610 and 6.85% of total deaths (WHO, 2017). Around 60,000 children under the age of five in Nigeria die from diarrhoeal diseases essentially caused by the country's poor levels of access to water, sanitation and hygiene (Thisday, 2017).

The gender perspective to sanitation is equally important. Women and girls are disproportionately impacted by the rampant lack of access to clean water and adequate sanitation. Apart from exposure to all variants of toilet infections in badly managed toilets, they stand the risk of exposure to rape and sexual harassment, in their quest to finding an open place to defecate WaterAid, 2013 ; Aung, 2017. Ezekwe *et al*. (2011) and Oyesile and Olapeju (2012) among other works, had established a nexus between the lack of toilets and open defecation. Like in most Nigerian settlements, residents of Ogun state mostly live in buildings without improved sanitary facilities. Improved toilet facilities are the safely managed and

environmentally friendly variants that are also unshared (WHO/UNICEF JMP, 2017; Harada *et al.*, 2016).There are sizeable numbers of households who have the luxury of toilets, both improved and unimproved, who still practice open defecation within the State.

The study is aimed at investigating the significant factors that account for why people who have toilets still defecate in the open, with the view of providing sustainable solutions to the open defecation challenge.

II. METHODS AND PROCEDURES

The study adopted the multi-stage approach. The first stage involves the classification of Ogun state into its three main senatorial districts, viz: Ogun East Senatorial District, Ogun West Senatorial District, and Ogun Central Senatorial District, as shown in figure 2. These divisions represent the three fundamental sub-ethnic divisions within the State. While Ogun East Senatorial District is dominated by the Ijebu sub-ethnic demographic, Ogun West Senatorial District has the preponderance of the Yewa and Aworis, and Ogun Central Senatorial District is largely occupied by the Egbas. As shown in figure 3, Ogun East Senatorial District consists of nine local governments, which are: Ijebu East, Ijebu North, Ijebu-Ode, Ikenne, Ijebu North-East, Odogbolu, Sagamu, Ogun Waterside and Remo North. Ogun West Senatorial District, as shown in figure 4, consists of five local governments, which are: Ado-Odo/Ota, Yewa North, Yewa South, Imeko-Afon, Ipokia. Furthermore, as shown in figure 5, Ogun Central Senatorial District consists of six local governments, which are: Abeokuta South, Abeokuta North, Obafemi/Owode, Odeda, Ewekoro and Ifo.
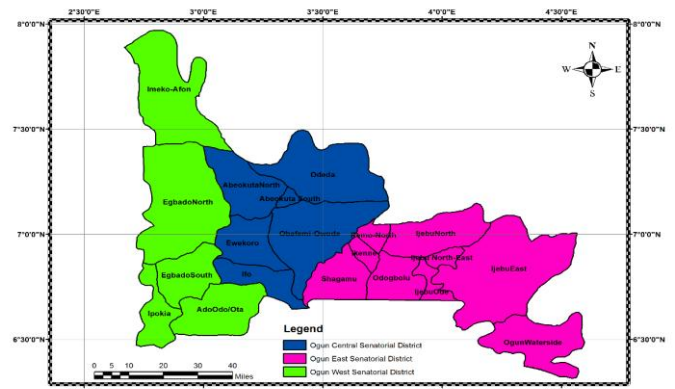

Figure 2: Map of Ogun State Showing Ogun East, Ogun West and Ogun Central Sampling Senatorial Districts in the Study Area
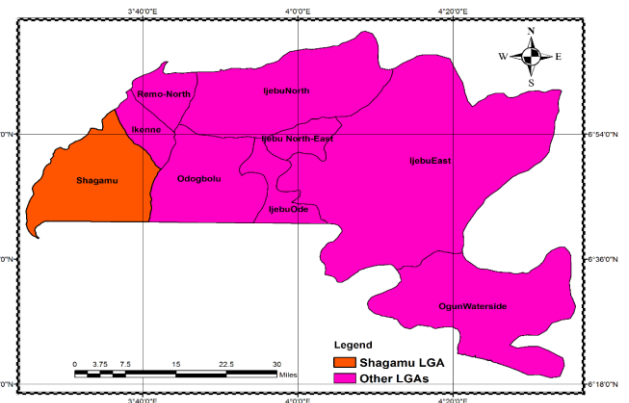

Figure 3: Map of Ogun East Sampling Senatorial District Showing Shagamu Local Government Area, the Sampling Local Government in Ogun East. Source:
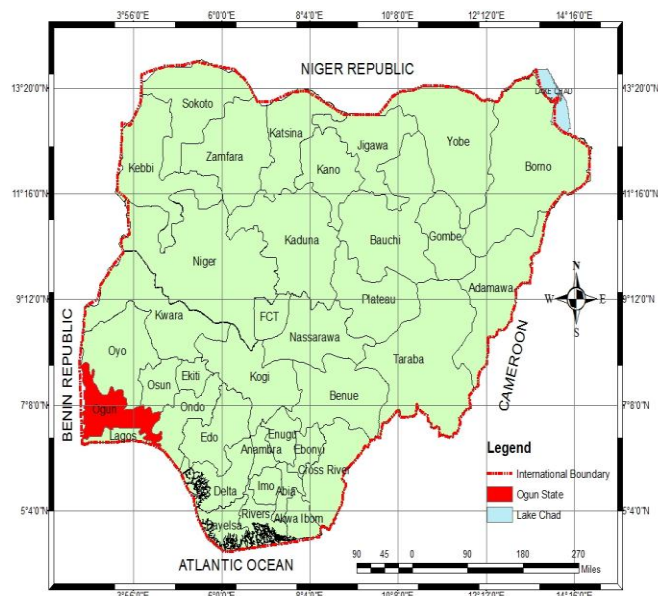

Figure 1: Map of Nigeria showing all the 36 states including Ogun state
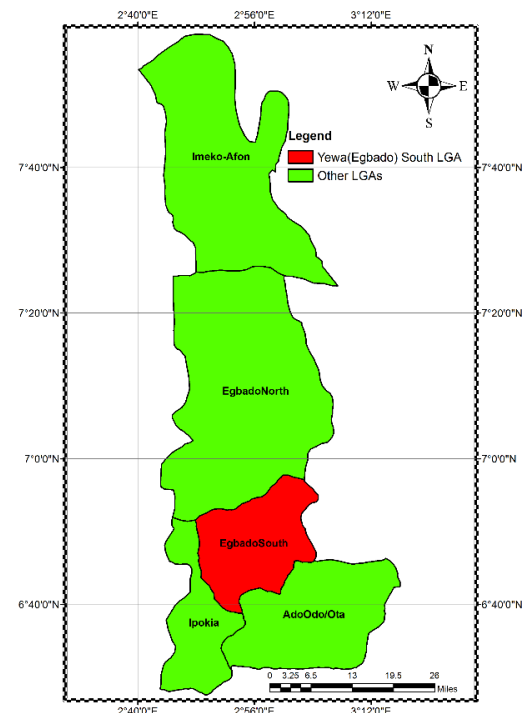

Figure 4: Map of Ogun West Sampling Senatorial District Showing Yewa South Local Government Area, the Sampling Local Government in Ogun West. Source:
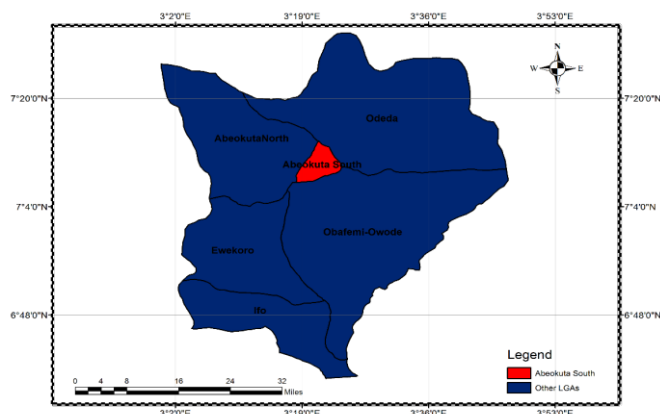
Figure 5: Map of Ogun Central Sampling Senatorial District Showing Abeokuta South Local Government Area, the Sampling Local Government in Ogun Central

The second stage involves the random selection of Sagamu, Yewa South, and Abeokuta South Local Governments as the sampling Local Governments in Ogun East Senatorial District, Ogun West Senatorial District, and Ogun Central Senatorial District, respectively. The third stage involves the random selection of a representative ward, based on the wards and polling unit delineations of Independent National Electoral Commision (INEC), from each of the sampling Local governments. In Sagamu Local Government, which consists of 15 political wards namely: Oko/Epe/Itula I; Oko/Epe/Itula II; Ayegbami/Ijokun; Sabo I; Sabo II;Isokun / Oyebajo; Ijagba; Latawa; Ode -Lemo ;Ogijo/ Likosi; Surulere; Isote; Simawa / Iwelepe; Agbowa; and Ibido/Ituwa/Alara, Ogijo/Likosi ward was randomly selected as the sampling ward. Out of the 10 Local Governments in Yewa South, namely Ilaro I; Ilaro II; Ilaro III; Iwoye; Idogo; Oke Odan; Owode I; Owode II; Ilobi/Erinja; and Ajilete, Ilaro I was randomly selected as the sampling ward. Further, Sodeke/Sale-Ijeun I was randomly selected as the sampling ward in Abeokuta South Local Government, which encapsulates 15 political wards, namely, Ake I; Ake II; Ake III; Keesi/Emere; Ijemo; Itoko; Ijaye/Idi-Aba; Erunbe/OkeIjeun; Ago-Egun/Ijesa; Sodeke/Sale-IjeunI; Sodeke/Sale-Ijeun II; Imo/Isabo; Igbore/Ago Oba; Ibara I; and Ibara II.

The fourth stage involves the random selection of polling units in each sampling ward, and the random selection of buildings occupying targeted households and locating within 1 kilometre radius from the polling units. The polling units are nationally recognized landmarks for further categorising spatial entities into smaller homogenous units. All the polling units in each of the sampling wards were identified. In Ogijo/Likosi ward, out of the available 19 polling units, 5 namely: St Paul's school Igbode; St Micheal RCM Fakale;U.A.M.C School Iraye; St Francis school Igbosoro; and St John school Ogijo, were randomly selected. In Ilaro I, out of the available 17 polling units, 5, namely : State hospital ; Opp Soyinka's house I; Idowu's house(Otegbeye street);U.A.M.C school Pahayi; and Orita Kajola; were randomly selected. In Sodeke/Sale-Ijeun II, out of the available 25 polling units, 5, namely: Onijoko Mosque OkebodeII; Opp Oke-Itoku Mosque II; Ile Ogboni Oke Itoku; Near Town Planning; and Open space Ojulakijena, were

randomly selected. This made the total number of polling units within the radius of which households were surveyed in the study area to be 15. Using the systematic random sampling technique on the basis of the 5th building interval, 11 households were administered questionnaires within 1 kilometer radius of each of the 5 randomly selected polling units in Ogijo/Likosi ward ; 10 households were administered questionnaires within 1 kilometer radius of each of the 5 randomly selected polling units in Ilaro I; while 12 households were administered questionnaires within 1 kilometer radius of each of the 5 randomly selected polling units in Sodeke/Isale-Ijeun I.

A total of 165 questionnaires were administered to representative households in the study area. This implies that 55, 50, and 60 questionnaires were administered in Ogijo/Likosi, Ilaro I, and Sodeke/Sale-Ijeun I wards, respectively, on the basis of ratio 1.1:1.0:1.23, which reflects the variance in population of 1,250,435(33%), 1,112,761(30%), and 1,387,944(37%) for Ogun East, Ogun West and Ogun Central, respectively. The multi-stage method adopted, which several random processes enable eventual selection of suitable samples within homogenous clusters, immensely reduced the chance of sampling error that could be associated with the sample percentage.

Data collected for this study was checked for errors, and necessary corrections were made. Coding of variables as well as classification of data was equally carried out to facilitate analysis. SPSS software (Version 16.0) was employed to analyze the data collected. For bivariate analysis, chi-square (Pearson) statistics was used to assess relationships between how household toilets are shared ,income level of households , and the level of education of the household heads, with the level of significance at <5%. Binary logistic regression was used to assess the significant predictor variables that best explain why respondents who have toilets still défécate in the open,and their odd ratios equally determined. Variables with a p-value of <0.05 after backward elimination were retained in the final model.

III. MAIN RESULTS

A. SOCIO-ECONOMIC CHARACTERISTICS OF SURVEY RESPONDENTS

The age of respondents ranged from 27 years to 78 with a median age of 52 years and a standard deviation of 12.8. Most of the respondents were male (64.2%) and essentially of the Yoruba ethnic demographic. Also, 79.5 % of respondents had as minimum, secondary education. 97.4% were employed either as artisans, civil servants and private sector employees, while the rest are unemployed. In addition, while majority of respondents (45.9%) were ranked as belonging to the Lower-Middle Class, others belonged to the Upper-Medium Class (26.1%), Floating Class (12.1) and the Rich (4.8%). This is in line with the World Bank classifications of economic classes on the basis of per capita consumption levels in Africa, which are < \$61 dollars per month, < \$124 per month,< \$310 per month, <\$ 620 per month, and > \$ 620 per month for the Poor,

Lower-Middle Class, Upper Middle Class, and the Rich, respectively (Corral Rodas, 2017).

B. SANITARY PROFILE OF HOUSEHOLDS

As shown in Table 1 it is evident that majority of the households have toilets (95%). The major types of sanitation facilities in the study area are the pit latrines with slabs (54.5%) and the WC to septic tanks (40.5%). Moreover, while 84.02% of the total households share toilet facilities with other households, with mean total number of households living in their buildings being 6, only 15.8% do not share toilet facilities with other households. Table 1 is instructive on the proportions of households who either share or, use exclusively, specific sanitation systems. Of the 90 households using pit latrines with slabs, none actually use the toilets exclusively. However, while 25.4% of the households in the study area share their flush WC to septic tank systems with other households, 15% of the households, who use same, do not share them. In line with Tsinda(2013), which classified improved sanitation facilities as including a pour flush toilet systems connected to an off-site central sewage system by sewers, a septic tank, or a pit latrine; Ventilated Improved Pit latrines; and a pit latrine with a slab; which are equally exclusive to unit households, only 15% of the households in the study area can be said to have access to improved toilet facilities.

Type of Sanitation System			How Toilet is Being Shared					
			Shared		Not Shared		Total	
Categories	N	%	N	%	N	%	N	%
WC to Septic Tank	67	40.5	42	25.4	25	15	67	40.6
Pit Latrines with Slabs	90	54.5	90	54.6	0	0	90	54.5
No Toilets	8	5	-	-	-	-	8	4.9
Total	165	100	25	80	25	15	165	100

Table 1: Sanitation Profile of Households

C. RELATIONSHIP BETWEEN HOW HOUSEHOLDS' TOILETS ARE SHARED AND ASSOCIATED VARIABLES

How households' toilets are shared as the dependent variable for this analysis, at 0.00 significant levels, for both Kolmogorov-Smirnov and Shapiro=Wilk tests, failed the normality test. This made imperative the adoption of a non-parametric chi-squared test to assess inherent study's bivariate relationships. Table 2 shows that significant association was found between how households' toilets are shared and the level of education of the representative households heads (P=0.00) Furthermore, how households' toilets are shared was significantly associated with the economic class of households (P = 0.00). The import of these is that the propensity to construct and use toilets that are shared by households is influenced by both the level of education and economic classes of households' heads.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square 1	62.826[a]	12	.000
Pearson Chi-Square 2	49.372[a]	9	.000

Table 2: Relationships Between How Households' Toilets Are Shared and Other Associated Variables

D. PERCEIVED REASONS WHY HOUSEHOLDS WHO HAVE TOILETS STILL DEFECATE IN THE OPEN

Investigation of households' perceptions on why they still defecate in the open despite the availability of toilets relied on two major scales. First, perceived reasons why households with shared toilets still defecate in the open. Second, the perceived reasons of why households with improved toilets still defecate in the open. Both scales were deemed reliable at Cronbach's alpha coefficient values of 0.71 and 0.76, respectively. Findings revealed that households who use shared toilets (76.2%) believed that queues, occasioned by the need for households to use toilets, most especially in the morning, cause households to recourse to open defecation. In addition, 62.2% of respondents believed the fact that toilets are messy and odorous explains why households may defecate in the open. While, 85.5% of respondents perceived the danger of contacting disease in toilets as a reason households defecate in the open, 61% agreed scarcity of water can make households resort to the less water intensive open defecation. Furthermore, 55.1 percent believed that, that privacy is not afforded in the architecture of toilets is not a reason households defecate in the open. The largest chunk of respondents overwhelmingly agreed with the phenomenon of poor illumination, especially at nights, best explained by the paucity of electricity supply in the study area, as being an important factor that can make households rather be wont to open defecation. 50% of the respondents believed that the not too easily accessible nature of toilets' locations within buildings' sites equally account for why households indiscriminately defecate in the open.

Description of Variables	Agree		Undecided		Disagree	
	N	%	N	%	N	%
There is usually queues during peak periods	125	76.2	5	3	34	20.8
The toilets are usually not neat	102	62.2	-	-	64	37.8
The Fear of Contacting Diseases	141	85.5	-	-	24	14.5
Scarcity of Water	100	61	-	-	64	39
Privacy not afforded	53	32.1	21	12.7	91	55.1
Toilets not properly illuminated at nights	153	92.7	4	2.4	8	4.8
Toilet not easily accessible	66	50	18	13.6	48	23.4

Table 3: Perceived Reasons Why Households with Shared Toilets still Defecate in The Open

For households who use improved toilets, 68% believed occasional unavailability of water, which renders the flush

system non-functional, makes households resort to open defecation. 80% of the respondents believed households would defecate in the open whenever they are pressed, not at home, and there are no public toilets in sight at such critical moments, while 68% actually do not think people do not check whether there are public toilets in the environment, at the points they get pressed, as a reason they openly defecate. While 84% believed available public toilets are odorous and unclean, 60% deemed the lack of the deterrent factor, as open defecators do not get cautioned, as a reason households with improved toilets still defecate in the open. However, 52% of respondents believed that, that most people defecate in the open spaces is not a justification for households to also defecate in such spots. Finally, 84% of respondents reckoned households would not recourse to open defecation if they knew clean public toilets were available within the neighbourhoods, especially whenever they are not at home.

Description of Variables	Agree		Undecided		Disagree	
	N	%	N	%	N	%
Occasionally when water is not available	113	68	-	-	52	32
When Pressed and not at home	165	100	-	-	-	-
There are usually no public toilets around those critical moments, especially whenever I am not at home	132	80	-	-	33	20
I do not bother to check whether there are public toilets at the points I get pressed	52	32			113	68
The public toilets available are usually odorous and messed up	137	84			18	16
I do not get cautioned by anyone for defecating in the open	99	60			66	40
Most people also defecate in the open spaces where I defecate whenever I am pressed	79	48			86	52
Even when I am aware clean public toilets are available, I still prefer defecating in the open	26	16			139	84

Table 4: Perceived reasons of Why Households with Improved Toilets still Defecate in The Open

E. FACTORS PREDICTING WHETHER HOUSEHOLDS WITH TOILETS WILL STILL DEFECATE IN THE OPEN

Logistic regression which assessed the impacts of key factors on the phenomenon of open defecation by households who have toilets revealed a lot of key information. First, in the classification table, the overall percentage of correctly classified cases is 52.3%. Second, the Omnibus Tests of Model Coefficients, which suggests the goodness of performance of the model and equally known as the goodness of fit test, at a significance value of 0.00(< 0.05) and chi-squared value of 62.8 with 17 degrees of freedom is significant. It indicates that the model is better than SPSS's original guess that no households with toilets still defecate in the open. Third, the Hosmer and Lemeshow Test, at a chi-squared value of 3.334 with a significance level of 0.853(> 0.05) also corroborates the validity of the model. Fourth, Cox & Snell R Square and Nagelkerke R Square values of .333 and .445, respectively, which are the pseudo R square statistics, suggest that between 33.3% and 44.5% percent of the variability is explained by the model's predictors. Fifth, the variables in the equation show HIEDQU (2), HIEDQU (4)(The dummies of the categorical variables of the highest education attained by respondents), and NRODHT(Neatness of Toilets as the reason households defecate in the open) at significance levels of 0.016, 0.011, 0.10, were the only significant predictors. Other variables like Age(AGE), Marital status(MATSTA), Economic level (ECOLEV), Technology of sanitation facility(LATEC), How toilets are shared (HTISBH), Queues, occasioned by the need for households to use toilets, most especially in the morning(QRODHT), Fear of contacting diseases(FRODHT), water scarcity(WRODHT), and privacy of toilets(PRODHT) did not significantly contribute to the model. The significant equation is:

$$Log(p/1-p) = -17.891 - 3472*HIEDQU(2) - 3.245*HIEDQU(4) + 0.741*NRODHT. \quad (1)$$

The negative B values in HIEDQU (2) and HIEDQU (4) implies that the higher the level of the two dummies of level of education, the lower the propensity to defecate in the open. Also, the higher the perception that households' toilets are odorous and messy, the greater likelihood that households would seek recourse to open defecation. This is evident in the positivity of its B value. Sixth, as shown in column Exp (B) of Table 5, the odd ratios of 0.31 and 0.39 for HIEDQU (2) and HIEDQU (4), respectively, suggests that the likelihood for households with toilets to still defecate in the open is 0.39 lower for households where the heads are tertiary institution graduates than households where the heads' highest education attainment is secondary school. Moreover, at odd ratio of 2.097 for NRODHT, the tendency for open defecation increases for households as the perception that household toilets are odorous and messy, increases. Seventh, as shown in the last two columns of Table 5, one can be 95% confident that the actual value of 0.39 odd ratio for HIEDQU (4) in the population lies between .003 to .471. Similarly, one is 95% confident that the actual value of 2.097 odd ratio for NRODHT in the population lies between 1.196 to 3.678. That all the ranges exclude the value of 1, which would have indicated equal opportunity for the responses Yes/No in the question of whether open defecation is still being practiced by households who have toilets, the results can be said to be statistically significant.

IV. CONCLUSION

The paper offers a different view to the open defecation phenomenon that can be of help to government policy makers, Non-governmental Organizations and International stakeholders in the quest to eradicate open defecation and

ultimately meet sustainable development goal 6 and its target B. The critical point is that toilet provisioning without the adoption of holistic infrastructural and policy framework would not suffice in the quest to eradicating open defecation. Urban Planning is key to ensuring building plans that can afford improved and unshared toilets are only considered approvable by planning agencies. It can also be the instrument for discouraging open defecation through proactive landscape planning of open spaces, mainstreaming of transport terminals that integrate adequate toilet facilities in cities' master plans, and the equitable distribution of public toilets in neighbourhoods. Moreover, water, electricity and the will to enforce sanitation laws by municipal authorities should equally be ranked as imperative.

REFERENCES

[1] Aung, T.T. (2017) Insufficient Toilets Pose Risk to Women and Girls, https://www.irrawaddy.com/news/burma/insufficient-toilets-pose-risk-women-girls.html(accessed: 11 November 2017)

[2] Corral Rodas, P.A., Molini, V. and Oseni, G. (2017) No Condition Is Permanent: Middle Class in Nigeria in the Last Decade, http://documents.worldbank.org/curated/en/143471467986244382/pdf/WPS7214.pdf (accessed 11 January 2018).

[3] Dailytrust (2017) Nigeria loses $1bn to open defecation yearly – UNICEF, https://www.dailytrust.com.ng/news/environment/nigeria-loses-1bn-to-open-defecation-yearly--unicef/198994.html (accessed 14 October 2017).

[4] Ezekwe I.C, Odubo T.V, O.E. and A.I(2011) HousingSanitationandFaecalSludgeManagementinOwerri Nigeria. Journal of Geographic Thought (Journal of Department of Geography and Environmental Management, University of Port Harcourt), 12(1&2), 89–102.

[5] Harada, H., Strande, L. and Fujii, S. (2016) Challenges and Opportunities of Faecal Sludge Management for Global Sanitation. In: Takeshi Katsumi, S.H., (ed.) Towards Future Earth: Challenges and Progress of Global Environmental Studies. Kaisei Publishing, Tokyo, pp.81–100.

[6] Oyesile, S. and Olapeju, O.(2012) Assessing_Fecal_Waste_Management_In_Ilar. Urban and Regional Planning Review, 1&2(3), 163–170.

[7] Thisday (2017) New Statistics Reveal Huge Challenge on Water, Toilets for All in Nigeria, https://www.irrawaddy.com/news/burma/insufficient-toilets-pose-risk-women-girls.html [Accessed: 11 November 2017].

[8] Tsinda, A. Abott P., Pedley, S., Charles, K., Adogo, J., Okurut, K., Chenoweth, J.(2013) Challenges to achieving sustainable sanitation in informal settlements of Kigali, Rwanda. International Journal of Environmental Research and Publi Health, 10(12),.6939–6954.

[9] WaterAid (2013) Women and WASH, file:///C:/Users/HP/Downloads/Briefing Note How can water sanitation and hygiene help realise womens rights and gender equality (1).pdf (accessed14 October 2017)

[10] WaterAid(2016) Nigeria' s sanitation crisis, file:///C:/Users/HP/Downloads/Nigeriassanitationcrisis2016worldtoiletdaynigeriasupplement.pdf(accessed 14 October 2017).

[11] WHO (2017a) World Health Rankings Live Longer Live Better, http://www.worldlifeexpectancy.com/nigeria-diarrhoeal-diseases (accessed14 October 2017].

[12] WHO (2017b) WHO Key facts, http://www.who.int/mediacentre/factsheets/fs297/en/, (accessed 14 October 2017).

[13] WHO/UNICEF JMP (2017) Progress on Drinking Water, Sanitation and Hygiene WHO Library

[14] Cataloguing-in-PublicationData,

[15] http://www.wipo.int/amc/en/%0Ahttp://www.who.int/about/(accessed: 11 November 2017)

[16] World Bank, (2012) The key messages Sanitation Data from 18 Countries in Africa, http://siteresources.worldbank.org/INTAFRICA/Resources/economic-impacts-of-poor-sanitation-in-africa-factsheet.pdf, (accessed 14 October 2017).