



THE CHALLENGE OF OPEN DEFAECATION (OD) AND COMMUNITY-LED TOTAL SANITATION (CLTS) IN NIGERIA

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ABSTRACT

Recent World Health Organization report ranked Nigeria as number two (2) nation in Open Defaecation (OD). This is affirmed as an environmental nuisance that has over time engaged the attention of both government and non-governmental organizations (NGOs). And as part of their social responsibility the academia and corporate organizations working within the purview of environmental and public health domains have exhibited no less concern. Amidst a number of responses from government and other stakeholders in Nigeria, is the adoption of Community-Led Total Sanitation (CLTS) principle. The objective of this review paper aimed to examine this all-important subject matter, and to take a look at the enormity of the challenges and the efforts made so far in the country. Intense literature review was conducted on peer review journals and published work on OD in Nigeria. This aimed to assess (a) to what extent has OD been a public health risk in our communities? (b) What common practices within existing sociocultural norms in Nigeria constitute the prime drivers of OD? (c) What are the common impediments to combating OD in Nigeria? Conclusive review indicate that one of the proven strategies often deployed at community and programme level, Community-Led Total Sanitation (CLTS) or the Community Approach for Total Sanitation (CATS) as examined in the Nigerian context – its adaptability, effectiveness or otherwise. A few models were critically examined and relevant recommendations were made.

KEYWORDS: Defaecation, CLTS, CATS, Enteropathy, Schistosomiasis, Helminth, Diarrhoeal.

INTRODUCTION

As at the year 2015, WHO/UNICEF reports that 892 million people worldwide were practicing open defaecation (OD) and that about a quarter of this figure (220 million) reside in Sub-Saharan Africa (SSA).^[1] The report also hinted that most countries in Africa had less than 50% coverage with basic hand washing facilities and three out of five people in SSA with basic hand washing facilities (89 million people) resided in urban areas. According to the report almost one in three of the world's population – that's 2.3 billion people – do not have a decent toilet of their own ('basic' or 'safely managed' sanitation). The direct or indirect effects of these poor sanitation indicators include malnutrition, environmental enteropathy, poor child cognitive development and hence lower educational outcomes at schools, increased risk of infectious diseases (trachoma, diarrhea, schistosomiasis, soil-transmitted helminth, etc), and low productivity among adults.^[2,3,4,5] Each day about 1,000 children die from preventable water and sanitation-related diarrheal diseases; and overall water, sanitation, and hygiene was responsible for 829, 000 deaths from diarrhoeal disease in 2016.^[6,7] It is no wonder therefore,

that the Sustainable Development Goals (SDGs) target 6.2 makes a clarion call for ending OD and achieving universal access to sanitation, having due regard for equity, dignity, gender, and sustainability.^[6]

The Nigeria National Demographic and Health Survey, reports that only 30% of households in the country have an improved toilet facility that is not shared with other households and that only 61% of the households in Nigeria have access to an improved source of drinking water.^[8] These socio-demographic figures bespeak high tendencies for OD in the country. This picture has been corroborated by the multiple indicator cluster survey (MICS) 2016-2017 findings which yielded 23.5% national prevalence of OD.^[9] This figure was far higher in the rural (32.4%) than the urban (6.0%) areas, and regionally, North central had the highest (50%), while North West recorded lowest figure (14.3%). The MIC survey also revealed that only 35.9% people in Nigeria are users of improved sanitation facilities, while another 19.1% use unimproved sanitation facilities.

Nigeria is in the group of twenty countries in the world where access to basic sanitation is decreasing rather than increasing and where 67% its people lack decent toilet facilities.^[10] This invariably points to an unacceptably poor open defaecation free (ODF) status and huge gaps in personal health practices with attendant health risks in the country.

It is in light of the above that government and development partners in Nigeria have demonstrated concern through the adoption of proven interventions. Some of these responses include the mainstreaming of key programmatic measures such as the Sustainable Total Sanitation (STS) which encourages hardware provision and the community-led total sanitation (CLTS) which aims to change OD behavior at the community level by “triggering” disgust or shame around the practice and initiating community-led provision of sanitary toilet facilities. Government ministries and departments such as the Ministry of water resources at federal and state levels and relevant departments at local government level in collaboration with agencies like Unicef, WaterAid, UKaid have taken buy-in initiatives into programmes aimed at improving water supply and sanitation. Policy documents that provide strategic direction in this regard have been developed and monitoring frameworks put in place. Hence, this paper aims to;

- Look at open defaecation (OD) practices as a public health problem in Nigeria
- Examine the concept of Community-Led Total Sanitation (CLTS)
- Examine the various models of Community-Led Total Sanitation (CLTS) experimented in Nigeria
- Identify the challenges to the prevention of OD in Nigeria
- Recommend some possible solutions to overcoming identified challenges to implementing CLTS in Nigeria

Open Defaecation (OD) practices as a public health problem in Nigeria: UNICEF has defined open

defaecation (OD) as the practice of people going out “in fields, bushes, forests, open bodies of water or other open spaces, rather than using the toilet to defecate”.^[11]

Globally, Nigeria ranks third in OD as about fifty million of the population indulge in it. It is said to be an age-long tradition that has stubbornly persisted among the different cultures in the country. It is widely practiced in both rural (32.4%) and urban (6.0%) areas, as slums and ghettos keep springing up on regular basis and residential buildings make no provision for adequate sanitation or toilet facilities.^[9, 12]

Open defaecation has been implicated in many cases of diarrhoea, typhoid fever, hepatitis, cholera and polio among other diseases in Nigeria. Diarrhoea is the leading cause death in children under five years, with more than 88 per cent of diarrhoea in children attributable to OD which also makes them vulnerable to malnutrition and stunting etc. It increases the risk of polio infection as it is mainly transmitted through the faecal-oral route. Therefore, it is not surprising that Nigeria has found it very difficult to eliminate polio in spite years of relentless efforts.^[12]

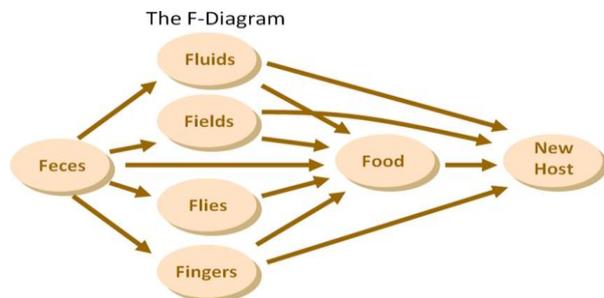
Available evidence shows that a gram of faeces contains about one million bacteria, 10 million viruses and one thousand parasite cysts. Furthermore, children’s faeces is said to contain more bacteria than adults’.^[11]

Generally speaking, OD in urban areas is driven by a number of factors which include giving priority to more dwelling rooms for rent than toilets in densely populated areas and unwillingness to invest in toilets by landlords and tenants. This explains why in the cities faeces are sometimes disposed of in public spaces - in some areas in Lagos, people use rail tracks at night to defecate, and in some cases any nearby refuse dump becomes a quick option for OD. On the other hand, in rural areas, the availability of nearby bushes encourages the option of open defaecation.^[11, 12]



Figure 1: Open defecation scenarios in Nigeria (The Guardian, Nairaland, Inside business online).

If left in the open, faeces are carried by flies, fluid (water), finger and field (the famous four of the F-Diagram of disease transmission) and infect another person through the faecal-oral route. Hookworm, that enters the body through unprotected feet, has a direct link with open defecation.^[13]



Source: Wagner and Lanols, 1958

Figure. 2: The F-Diagram.

The concept of Community-Led Total Sanitation (CLTS): Community-Led Total Sanitation (CLTS) refers to an innovative way of motivating communities to take self-driven initiatives for the complete elimination of open defecation (OD). In this approach communities are facilitated to carry out their own appraisal and analysis regarding OD and take their own actions towards the attainment of open defecation free (ODF) status. The key idea in CLTS is recognizing the fact that mere provision of toilets doesn't translate to their use, neither can it result in improved sanitation and hygiene.^[13]

Community-Led Total Sanitation (CLTS) comes under a general name known as Community Approach for Total Sanitation (CATS). The cardinal principles of CATS (i.e., demand creation for sanitation in communities to stop open defecation within a broader enabling environment), and consists of five pillars: to stop open defecation, promote handwashing with soap, improve household drinking water and food management, and manage solid and liquid waste.^[5]

On the other hand, Total Sanitation Campaign (TSC) entails the provision of subsidies or sanitation hardware, and its success measured by the number of people that have access to a toilet. There is complete reliance on administrative action instead of community participation in addressing its sanitation problems. This has, however, often led to uneven adoption, sustainability issues and

partial usage. It has also given rise to a subsidy-dependence culture. Hence, the two methodologies differ not only in philosophy, but in approach and definitions of success.^[14]

Again, CLTS dwells more on behavioural change that is required to ensure genuine and sustainable sanitary improvements. It invests more in community mobilization than in hardware, shifting focus from toilet construction for individual households to the creation of ODF communities/villages. Awareness is created that as long as a few continues to practice OD everyone remains at risk of infections. CLTS triggers the desire for collective change, and propels people into action thereby encouraging innovation, mutual support and sourcing of appropriate local technology, leading to greater community ownership and sustainability.^[13]

CLTS was first introduced by Kamal Kar, an Indian development consultant, working on the platform of a partnership between Village Education Resource Centre (VERC) and WaterAid Bangladesh, in the year 2000 in Mosmoil village, while assessing a typical subsidized sanitation programme. Drawing on his years of experience in participatory approaches on a range of development projects, Kar succeeded in persuading the local NGO to stop the top-down toilet construction subsidy programmes. Strongly advocating change in institutional attitude and the need to draw on more local mobilization and facilitation to enable villagers analyze their sanitation and waste management situation bringing about collective decision-making to stop OD.^[13]

The adoption and spread of CLTS within Bangladesh was rapid with informal institutions and NGOs being prime vehicles – indigenous and international NGOs were quick to adopt the approach. The World Bank Water and Sanitation Programme (WSP) was key in promoting the spread of CLTS to India, Indonesia and parts of Africa. With time, many other organizations became important disseminators and champions of CLTS, - some of whom include UNICEF, WaterAid, SNV, Plan International, WSSCC, Tearfund, Care, WSP, World Vision and others. As we speak, CLTS is in more than 60 countries in Asia, Africa, Latin America, the Pacific and the Middle East, and governments are increasingly taking the lead in scaling up CLTS. Many governments have also adopted CLTS as national policy.^[13]



Figure 3: CLTS Scenarios in Nigeria.

CLTS Experiment in Nigeria – Road Map for ODF Nigeria, Action against Hunger

Models of Community-Led Total Sanitation (CLTS) experimented in Nigeria

CLTS and its adaptations were piloted in Nigeria from 2004 to 2007 in several communities. The pilot interventions were carried out by several organizations such as UNICEF, WaterAid, State and Local governments in collaboration with the National Task Group on Sanitation. Based on the outcome, CLTS was adopted as a major approach for rural sanitation development in the government approved Strategy for Scaling up Sanitation and Hygiene to meet the MDGs in Nigeria (2007). The scaling up of CLTS in most states effectively commenced in 2008 coinciding with the International Year of Sanitation.^[15]

CLTS Pilot Project in Nigeria

Between 2004 and 2006 WaterAid piloted CLTS in Nigeria in 9 communities in Benue state. It started with a visit to Bangladesh by Nigeria stakeholders, and was designed using the Bangladesh CLTS model as a guide. The pilot project was implemented by WaterAid and its LGA and NGO partners with promising results - increases in latrine construction and improvements in hygiene practices in the target communities. Though the pilot recorded remarkable degree of success it had its own challenges. The findings from the pilot were used as the basis for methodology adjustments and the expansion of the CLTS concept into WaterAid's ongoing joint programme with UNICEF in a total of 24 communities in 12 LGAs in the states of Benue, Enugu, Ekiti and Jigawa.^[16]

A sample of 13 of the 24 communities was assessed at end line. The main finding of the evaluation is that the CLTS approach in the project area has generally been very successful in promoting significant reductions in the practice of open defecation in communities, with many of the assessed communities achieving open defecation-free status. The project was remarkably successful in promoting the construction of latrines: the 13 communities progressed from a total of 116 latrines before CLTS was initiated to 1,060 over an eight month period – all unsubsidised. This was an unprecedented rate of progress in Nigeria for unsubsidized latrines. Other key findings included significant improvements the environmental sanitation of communities, better personal hygiene, improved security and dignity for girls etc. However, the approach was much less successful in urban communities, in larger communities and in communities influenced by past or ongoing latrine subsidy programmes. The evaluation also found that the CLTS approach was most effective in communities where trained external facilitators guide communities through an intensive, participatory mobilisation process making use of the full set of CLTS tools (including transect walks, social mapping and faecal load calculations). Finally the evaluation found that an easily

accessible source of water is very important for the effectiveness of CLTS.^[16]

Nigeria was one of the first few countries in Africa to have resorted to the Community-Led-Total- Sanitation (CLTS) Approach in 2005-2006 (Unicef/FMWR, 2016). Since 2010, UNICEF has helped to promote the Community Led Total Sanitation (CLTS) approach in Nigeria, aiming to accelerate access to sanitation in poor, rural communities.^[17]

Under the UK Aid supported, Sanitation, Hygiene and Water in Nigeria (SHAWN) project, UNICEF supported nearly two million people gain sustainable access to sanitation, water and hygiene over a five-year period covering 2010-2014. Under the SHAWN project, two wards (out of 10 wards) in Mai'Adua LGA have been prioritised for CLTS interventions by Katsina State Rural Water Supply and Sanitation Agency (KTRUWASA), Bakori LGA WASH Department along with UNICEF.^[17]

Major institutions supporting CLTS implementation in the country are: the National Task Group on Sanitation (NTGS), National Water Resources Institute, the State Task Group on Sanitation (STGS), the State Rural Water Supply and Sanitation Agencies (RUWASSA), the Local Government Water, Sanitation and Hygiene (WASH) Departments or Units, the Community Water, Sanitation and Hygiene Committees (WASHCOMs) and many Community Based Organizations. 28 States have established Rural Water Supply and Sanitation Agencies; 24 States have LGA WASH Units while 7 States have WASH Departments.^[18]

The NTGS was established in 2002 under the direction of the Department of Water Quality Control and Sanitation of the Federal Ministry of Water Resources as a coordinating body and a national platform for the promotion of sanitation and hygiene in the country. Members are drawn from relevant Government Ministries, Departments and Agencies (Education, Environment, Health, Housing and Urban Development, Water Resources, Women Affairs, NAFDAC, NPHCDA, NPC); Development Partners (UNICEF, DFID, JICA, World Bank, EU); CSOs (NEWSAN, Youth WASH, WASH Media Network); and the Private Sector (Unilever). The Group meets regularly; and facilitates as well as participates in national and international events on sanitation and hygiene. There have been increased levels of subscriptions from governments at national and sub-national levels. The Federal Ministry of Water Resources is providing the required leadership in the promotion and advocacy for CLTS in the country in collaboration with other members of the NTGS for more funding from States and Local Governments to scale up CLTS implementation in the country.^[18]

Over the years and with all the 36 states and FCT now implementing CLTS at different scales, close to 10,000 personnel at Local, State and Federal levels have

undergone training or re-training on the approach. Also the capacity of over 10,000 Natural Leaders (NLs), Voluntary Hygiene Promoters (VHPs) and Water, Sanitation and Hygiene Committees (WASHCOMs) had been built at the community level across the country. Some Natural Leaders are also engaged as Community Consultants to facilitate CLTS promotion in neighbouring communities. As of June 2015, data from 48 LGAs populated on the WASHIMS showed that 9,962 communities have been triggered, of which 4,255 are certified ODF and 1,864 are claiming ODF status.^[18]

In Nigeria initially a scattered approach involving triggering communities all over a State was adopted. But soon it was realized that such an approach was not effective and hence an LGA-wide approach was introduced with encouraging results. As of July, 2014 CLTS has been initiated in all 36 States and FCT. Triggering has taken place in 19,467 communities of which 9,728 (around 50%) were declared ODF. Of this 3,276 (close to 34%) have been certified.^[18]

Status of CLTS Implementation in Nigeria - (As of July 2014)

S/N	State/FCT	No of LGAs	Total no of Triggered communities	No of ODF declared Communities	%	No of ODF Certified Communities	%
1	Abia	17	368	166	45.1	18	10.8
2	Adamawa	21	209	3	1.4	0	0
3	Akwa Ibom	31	215	0	0	0	0
4	Anambra	21	559	506	90.5	106	20.9
5	Bauchi	20	2200	1690	76.8	394	23.3
6	Bayelsa	8	92	0		0	0
7	Benue	23	1607	1385	86.2	639	45.8
8	Borno	27	85	30	35.3	0	0
9	Cross River	18	1461	742	50.8	373	50.3
10	Delta	25	65	0		0	0
11	Ebonyi	13	343	281	81.9	19	6.8
12	Edo	18	75	0	0	0	0
13	Ekiti	16	274	95	34.7	22	23.2
14	Enugu	17	578	441	76.3	34	7.7
15	FCT (Abuja)	6	98	9	0	0	0
16	Gombe	11	42	17	40.5	0	0
17	Imo	27	462	401	86.8	10	2.5
18	Jigawa	27	1404	513	36.5	386	75.2
19	Kaduna	23	226	58	25.7	1	1.7
20	Kano	44	1569	75	4.8	23	30.7
21	Katsina	34	1595	1242	77.9	729	58.7
22	Kebbi	21	197	114	57.9	88	77.2
23	Kogi	21	322	157	48.8	20	12.7
24	Kwara	16	384	230	60	0	0
25	Lagos	20	327	5	1.5	0	0
26	Nasarawa	13	149	0	0	0	0
27	Niger	25	190	46	24.2	0	0
28	Ogun	20	679	257	37.8	84	32.7
29	Ondo	18	207	123	59.4	0	0
30	Osun	30	1500	670	44.7	220	32.8
31	Oyo	33	131	88	67.2	10	11.4
32	Plateau	17	56	0	0	0	0
33	Rivers	23	133	0	0	0	0
34	Sokoto	23	671	159	23.7	0	0
35	Taraba	16	721	190	25.4	76	40
36	Yobe	17	219	25	11.4	14	56
37	Zamfara	14	44	10	22.7	10	100
	Total	774	19,467	9,728	50	3,276	33.7

Source: Ministry of Water Resources, Abuja

The sanitation situation in the country prompted the National Council on Water Resources in 2014 to

prioritize the development of a roadmap towards eliminating open defecation in the country, in line with

the United Nations global campaign for ending open defecation. This initiative tagged “Making Nigeria Open Defecation Free by 2025: A National Roadmap” was developed by the Federal Ministry of Water Resources with invaluable support from UNICEF and other key sector players across Nigeria. In 2016, the National Council on Water Resources endorsed this road map as a mean to eliminate open defecation in Nigeria.^[18]

Community Led Total Sanitation (CLTS) has proven to be an effective approach towards accelerating sanitation access in the country having exponentially grown from a mere 15 ODF communities in 2008 to over 14,000 ODF communities in 2016. The expansion of CLTS program has led to a growing pool of trained CLTS facilitators and has improved the quality of triggering and ODF certification process. In terms of providing the enabling environment for the implementation of the ODF road map, the Ministry of Water Resources has clearly prioritized elimination of open defecation in its recently launched “Partnership for Expanded WASH (PEWASH)” program.^[18]

Achieving an ODF Nigeria would require constructing nearly 20 million household toilets and 43,000 toilets in schools, health centres and public places requiring an average annual investment of about NGN 100 billion (approximately 75% household investment; 25% government contribution).^[18]

A laudable institution-driven CLTS initiative by the academia has been piloted by the Kwara State University (KWASU) Centre for Ecological and Environmental Research Management and Studies (CEERMS) Malete, in 19 states and the Federal Capital Territory (FCT) Abuja, Nigeria.^[19]

Challenges to the prevention of OD in Nigeria

Though there are quite a good number of drivers of OD in Nigeria, three might be more fundamental: poverty, lack of lavatories and ingrained cultural norm, which makes the practice socially accepted in some parts of the society.^[12]

Challenges related to implementation of CLTS in Nigeria include

- Lack of skilled facilitators for scaling up CLTS
- Inadequate follow-up and monitoring by the LGA WASH units
- Poor documentation, record keeping and reporting of CLTS outputs at the LGA and State level.
- Slow pace in moving up sanitation ladder.
- Huge gap between the number of triggered communities and the number achieving ODF.
- Slippage - Relapse of ODF communities to OD status
- Weak political commitment to CLTS projects
- Incentives for Natural Leaders
- Other existing pre-CLTS sanitation projects with latrine hardware subsidy components

- Lack of sustainability local resource mobilization framework
- Poor coordination

RECOMMENDATIONS

To be able to overcome most of the challenges outlined above it is imperative to institute the following measures.

- In addition to the participatory community appraisal approach of CLTS, there is the need to coerce non-compliant communities or households to stop open defecation, by passing appropriate laws and advocating peer sanction mechanism at community level.
- Town planners and other government agencies in charge of built environment should ensure that toilets are incorporated in building plans and structures being developed.
- Policy and budgetary provisions on Water and sanitation must be seen as critical elements of governance. And to facilitate the achievement of ODF status in communities and for the sustainability of the gains of CLTS in Nigeria, it is recommended that the following be continued.^[15]
- Capacity building in resource mobilization for the provision of sanitation facilities in public places and institutions.
- Promotion of networking and Partnership with Civil Society Organizations and media for mobilization of financial and human resources for scale-up
- Continuous sensitization and advocacy to policy makers
- Innovations in terms of sanitation marketing strategies to address high demand for sanitation services
- Promotion of local, innovative and affordable technologies for the construction of latrines that is resilient to collapse and other challenges
- Sharing of best practices in knowledge and technology across national, States, LGAs and Community boundaries
- Continuous engagement of Natural Leaders to facilitate CLTS promotion in contiguous communities
- Continuous training and orientation of community facilitators
- Institutional strengthening by providing technical assistance and other forms of operational support
- Intensifying monitoring and follow up using verifiable data
- Strengthening the integrated Water, Sanitation and Hygiene Information Management System (WASHIMS) for improved reporting and management of CLTS and other WASH data

CONCLUSION

The persistence of OD despite documented efforts by the government and its development partners, underscores the Public Health significance of the problem in Nigeria. Hence, the call for continued efforts by all stakeholders for more locally oriented innovations to address the underlying issues of poverty, cultural norms and lack of

public infrastructure for sanitation and hygiene should be intensified. Again, proactive response measures targeted at proffering solutions that suits the different epidemiological patterns of OD should be deployed. For instance, the approach to tackling OD in rural communities should be different from that of urban OD communities. There should be more multi-sectoral synergy among all key players like research bodies and the academia, development partners, agencies, CSOs and superintending government organs in the country. And in view of the tremendous success of the elimination of OD by means of CLTS strategy in other climes,^[20, 21, 22, 23] all efforts must be aimed at the effective implementation of the approach and its adapted forms in Nigerian communities. The attainment of 100% ODF verified and certified communities in Nigeria is not only a doable task but a task that must be done.

REFERENCES

1. WHO/UNICEF Joint Monitoring Programme. Progress on Sanitation and Drinking Water—2017 Update and SDG Baseline; World Health Organization: Geneva, Switzerland.
2. Olorunfoba, E. O., Folarin, T. B., & Ayede, A. I. Hygiene and sanitation risk factors of diarrhoeal disease among under-five children in Ibadan, Nigeria. *African Health Sciences*, 2014; 14(4): 1001–1011. <http://doi.org/10.4314/ahs.v14i4.32>
3. Strunz, E.C.; Addiss, D.G.; Stocks, M.E.; Ogden, S.; Utzinger, J.; Freeman, M.C. Water, sanitation, hygiene, and soil-transmitted helminth infection: A systematic review and meta-analysis. *PLoS Med.*, 2014; 11: e1001620.
4. Mbuya, M.N.; Humphrey, J.H. Preventing environmental enteric dysfunction through improved water, sanitation and hygiene: An opportunity for stunting reduction in developing countries. *Matern. Child Nutr.*, 2016; 12(Suppl. 1): 106–120.
5. Odagiri, M., Muhammad, Z., Cronin, A., A., Gnilo, M., E., Mardikanto, A., K., Umam, K., & Asamou, Y., T. Enabling Factors for Sustaining Open Defecation-Free Communities in Rural Indonesia: A Cross-Sectional Study. *Int. J. Environ. Res. Public Health*, 2017; 14: 1572; doi: 10.3390/ijerph14121572.
6. United Nations. Sustainable Development Goals (SDG). <https://www.un.org/sustainabledevelopment/water-and-sanitation>, 2018 (Accessed on 14/09/2018).
7. WHO/GHO. Global Health Observatory (GHO) data - Mortality and burden of disease from water and sanitation. http://www.who.int/gho/phe/water_sanitation/burden/en, 2018. (Accessed on the 15/09/2018).
8. National Population Commission (NPC) [Nigeria] and ICF International. Nigeria Demographic and Health Survey 2013. Abuja, Nigeria, and Rockville, Maryland, USA: NPC and ICF International, 2014.
9. National Bureau of Statistics (NBS) and United Nations Children's Fund (UNICEF). Multiple Indicator Cluster Survey 2016-17, Survey Findings Report. Abuja, Nigeria: National Bureau of Statistics and United Nations Children's Fund.
10. WaterAid. Sustainable Total Sanitation: An emerging framework, 2018.
11. Unicef, India. Eliminate Open Defecation - Eliminate Open Defecation. <http://unicef.in/Whatwedo/11/Eliminate-Open-Defecation> (Accessed on 19/09/2018).
12. Punch Newspaper. Open defecation: Nigeria's sanitation challenges. (April 22, 2018). <https://punchng.com/open-defecation-nigerias-sanitation-challenges/>(Accessed on 16/09/2018)
13. IDS. Community-Led Total Sanitation Approach. CLTS Knowledge Hub. Institute of Development Studies (IDS). 2018; <http://www.communityledtotalsanitation.org/page/clts-approach> (Accessed on 14/09/2018).
14. Dyalchand A., Khale M., Vasudevan S. Institutional arrangements and social norms influencing sanitation behaviour in rural India. In: Mehta L., Movik S., editors. *Shit Matters: The Potential of Community Led Total Sanitation*. Practical Action; Rugby, UK. 2011.
15. IDS. Community-Led Total Sanitation, Nigeria. CLTS Knowledge Hub. Institute of Development Studies (IDS). 2015, <http://www.communityledtotalsanitation.org/country/nigeria> (Accessed on 14/09/2018)
16. Unicef, Nigeria. Case Study: Community-Led Total Sanitation in Nigeria. (n.d.) https://www.unicef.org/wcaro/WCARO_Nigeria_CLTSCase-studies.pdf (Accessed on 23/09/2018)
17. Unicef Nigeria. Nigeria: community-led total sanitation pays off. 2011; https://www.unicef.org/nigeria/media_6517.html (Accessed on 18/09/2018).
18. UNICEF & FMWR, Federal Ministry of Water Resources. Making Nigeria Open Defecation Free by 2025: A National Roadmap. 2016; https://www.unicef.org/nigeria/NATIONAL_ROAD_MAP_FOR_ELIMINATING_OPEN_DEFECATION_IN_NIGERIA.pdf (Accessed on 16/09/2018)
19. KWASU (2018) Kwara State University (KWASU) Centre for Ecological and Environmental Research Management and Studies (CEERMS) Community-Led Total Sanitation (CLTS) Project (Unpublished).
20. Alzua, M., L., Pickering, A., J., Djebbari, H., Lopez, C., Cardenas, J., C., Lopera, M., A., Osbert, N., & Coulibaly, M. "Impact Evaluation of Community-led Total Sanitation (CLTS) in Rural Mali," CEDLAS, Working Papers 0191, CEDLAS, Universidad Nacional de La Plata. 2015.
21. Kar, K & Chambers, R (2008). Handbook on Community-Led Total Sanitation; Plan UK & Institute of Development Studies at the University of Sussex: London, UK.
22. Kar, K (2014). The road to 2015: experiences and challenges from Community-Led Total Sanitation (CLTS). <https://steps-centre.org/blog/road-2015->

experiences-challenges-community-led-total-sanitation-clts/ (Accessed on 19/09/2018).

23. Tessema, R. A. (2017). Assessment of the implementation of community-led total sanitation, hygiene, and associated factors in Diretiyara district, Eastern Ethiopia. *PLoS ONE*, *12*(4): e0175233. <http://doi.org/10.1371/journal.pone.0175233>.