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LESSONS FROM COMMUNITY-LED WATER, SANITATION AND HYGIENE INTERVENTIONS IN SELECTED RURAL SETTLEMENTS OF OYO STATE, NIGERIA

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ABSTRACT

Sustainability of Water, Sanitation, and Hygiene (WASH) interventions require a paradigm shift from the supply-driven to community-led approach. Achieving this goal requires an understanding of local efforts and challenges faced in solving their WASH-related problems. This study addressed these concerns through a case study of two affected rural communities in Ibarapa East Local Government Area of Oyo State, Nigeria. Using eight focus group discussions with 92 male and female household heads, and key informants' interviews with four community leaders, the study examined existing WASH situation and the community-led WASH interventions in the study area. Information garnered was audio-recorded, transcribed, and analysed using thematic analysis. Predominant ethnic group in the communities was Yoruba. Most were poorer than the average person. A distant stream, rainwater, and one uncompleted well were the water sources available in study locations and all had poor water quality. Open defecation was common due to the lack of modern toilets or latrines. Starvation, neighbourhood conflict, migration, skipping bathing and meals were major challenges related to WASH. Annual dredging of stream, repair of road linking the communities to the stream, enactment of laws prohibiting open defecating, and partnership with a rural development non-governmental organisation for support were major community-led WASH interventions in the study areas. Rural people tend to require external triggers or support to achieve sustainable solutions to hygiene problems. Collective community action triggered by a sense of disgust for inappropriate behaviours offers a more sustainable solution to WASH challenges.

Keywords: Rural water projects, Self-help intervention, Sanitation and hygiene, Rural poverty.

INTRODUCTION

Poor sanitation has always been associated with Africa. Unfortunately, sanitation has not received the priority it deserves in most African countries (The Guardian, 2012; Walker and Logan, 2016). It appears as not widely recognized how good sanitation policies and practices can underpin socio-economic development and environmental protection. According to Ojo (2017), Nigeria is the worst country in Africa for sanitation access due to unavailability of water for drinking and for other purposes in many homes. Access to clean and safe water is therefore key to achieving proper sanitation and hygiene. Nigeria has made substantial progress in developing policies and strategies for water supply and sanitation service delivery but faces major challenges in translating these into action. Consequently, about 70 million people, out of a population of 171 million, lacked access to safe drinking water, and over 110 million lacked access to improved sanitation in 2013 (UNICEF, 2016).

Poor hygiene and sanitation have serious implications on human's health and socio-economic wellbeing with children paying the most price in lost lives, missed schooling, in disease, malnutrition and poverty. The aforementioned is occasioned by the transfer of bacteria, viruses and parasites found in human excreta which otherwise contaminate water resources, soil and food (WHO, 2008). Poor water supply, sanitation and personal and domestic hygiene ranked among the highest risk factors, being responsible for 5.3% of deaths and 6.8% of disease burden (Hutton, nd).

Sesay (2012) noted that the predisposing factors to disease outbreak especially in unhygienic

areas include overcrowding, lack of sanitary excreta disposal facilities, high water-tables, lack of safe drinking water, poor food hygiene in markets (vendors and purchases), and inadequate solid waste disposal. These factors are more prominent and pronounced in both slum areas of the urban centres and most rural communities and hence, the dwellers suffer a greater incidence of malaria, diarrhoea outbreaks, and death. However, Nigeria Demographic and Health Survey (NPC, 2013) posited that across rural and urban areas, the WASH deprivation is about 1.5 times more in rural areas than urban areas. Unfortunately, Nigeria is ranked as one of the countries with more rural populace than urban [United Nations Population Division, 2017 cited by The Global Economy (n.d., Iruonagbe, 2009)]. This implies that more people are trapped in the water and sanitation poverty in this region when compared with the urban.

Improving water access, sanitation and hygiene situation in Nigeria requires more concerted efforts from various stakeholders than is currently being done. Sustainability of water, sanitation and hygiene interventions also require a paradigm shift from the supply driven to community-led approach which has been proven effective in most projects targeted at behavioural change among people (Im, and Rosenberg, 2015; Fadairo and Yahaya 2010). Thus, community-led approach therefore suggests that communities are allowed to steer their Water, Sanitation and Hygiene (WASH) development initiatives while the necessary support or assistance are provided by the government or other development agencies. Achieving this goal therefore requires an understanding of local efforts and



challenges faced in solving their WASH related problems. In this vein, pertinent questions need to be asked from affected communities in order to engender sustainable rural Water, Sanitation and Hygiene (rWASH) interventions. These include, how affected rural communities in Nigeria are responding to their WASH challenges and what kinds of help are needed to make their efforts effective? This study addressed these concerns through a case study of two affected communities in Ibarapa-East Local Government Area of Oyo state, Nigeria.

This paper reports the findings from the fieldwork targeted at the rWASH as a major challenge to sustainable rural development. The purpose of the study was to examine local efforts and challenges faced in solving WASH related problems in Oyo State, Nigeria. The specific objectives were to:

1. describe the existing water, sanitation, and hygiene situations/practices in the study area,
2. identify the social, environmental and health challenges faced by the rural people due to WASH situation,
3. investigate the community-led water, sanitation, and hygiene interventions in the study area; and
4. understand through collective community decision the kinds of support needed to enhance sanitation and hygiene within the rural settlements in study area.

METHODOLOGY

The study area is Ibarapa-East Local Government Area of Oyo State. The area is located within latitudes 70.15' N and 70.55' N and longitude 30E and 30.30' E. The study utilised a case study approach to fulfil its objectives. The phenomenon under study for the case was rWASH where the case were the sampled communities of Agele and Mogba in Ibarapa-East area of Oyo state. These communities were purposively selected for the study due to obvious conditions of water poverty which is thought to have implications for sanitation and hygiene of the people. In addition, previous studies have rated southwestern region of Nigeria as being the worst hit by the problem of open defecation (Federal Ministry of Water Resources, 2015) and Oyo State as one of the most fraught with problems of poor sanitation and hygiene in the region (The News, 2017). The population of the study comprised of all male and female household heads and community leaders in the sampled locations. Qualitative methods utilising focus group discussion and key informants' interviews were used for data collection. A short survey was carried out among the households in each of the locations to generate a pool of potential participants for focus group discussion as follows:

“Are you willing to participate in a 90-minute focus group discussion about water, sanitation and hygiene practices in your community?”

A total of 92 (47 female and 45 male) potential participants identified from the short survey were included in the study. Thus, eight focus group discussions comprising of 9-12 members per group were held in the study locations. Four community chiefs were purposively selected for in-depth interviews due to their prominent roles in communal governance and decision making. Focus group discussion/key informant interview guide prepared in English language and interpreted into Yoruba (local) language were used to facilitate discussion for data collection. These were backstopped with field observations. The facilitators for the focus group sessions utilised participatory tools such as pairwise ranking and problem tree analysis to elaborate collective participants position on topics discussed. The discussions which were done in the local language of the people (Yoruba) were audio taped in addition to notes that were taken. The audio recordings were later transcribed and analysed using thematic analysis. This involved coding responses into broad categories according to the interview questions. Codes were examined to identify related concepts and families of related themes were formed, creating a structure of issues that had a similar theme. In the results section, tables and figures generated from the use of participatory tools during focus group discussions were inserted. In addition, illustrative comments in quotes for the various themes were included in the narratives.

RESULTS AND DISCUSSION

Community characteristics

A combination of subjective measure and field observation were used to determine community characteristics such as ethnicity, religion and socio-economic status of the people. The predominant ethnic group in the communities was Yoruba representing about three-quarter of the population. Other residents were thinly spread among two ethnic minorities such as Fulani and Tiv including foreign migrants from the republic of Benin who migrated to the locations for farming purposes. This confirms the assertion that agriculture is a major attraction for migration into rural communities (Fadairo, Olutegbe and Eforuoku, 2018). More than half of the dwellers in the communities were Muslims and the rest practiced Christianity. In terms of socio-economic status, the participants adjudged most of the residents in the study area as poorer than the average person confirming the predominance of poverty in rural areas when compared with the urban (Proctor *et al.*, 2015). Both communities explained they had received assistance in the past such as provision of an uncompleted well in Agele community in 2016 and health care support to contain the problem of guinea worm disease outbreak in Mogba community

in 2002. The participants explained that the well in Agele community was abandoned by the contractor after failing to reach water as at when expected. They argued that members of the community were not consulted in the process otherwise, they would have suggested a better location for the well which they were sure would have become successful. Apart from the failed well and health care support for guinea worm, the communities had not received any other assistance or intervention from the government or development agencies. This situation depicts the conditions of neglect most rural areas suffer in Nigeria and aligns with the positions of Anyanwu, (2013) and Omoniyi (2018). In addition, the story of a failed well project in Agele community further lends credence to the arguments for deliberate social inclusion of beneficiaries of development projects in planning and implementation process for sustainability to be guaranteed (Fadairo, 2017).

Existing WASH situation/practices in the study area

The impact of inadequate water, sanitation services and hygiene fall primarily on the poor (Pruss-Ustun, 2008). In this section, we probed into sources of water for various domestic purposes in the study area and their waste management/disposal practices. The available water sources for the communities were stream (*Opeke stream*), rain and well which was only partially functional. The stream which is located about 1-hour walking distance from the community was the mostly used and accessed water source by the people as rain does not fall all year round and the only available well never spring adequate water even during the wet season (Table 1). Most respondents fetched water from the stream for drinking, cooking and household chores all year round. They supplement with rain water and the little produced by the only well available during the wet season. However, they only use water from the stream for agricultural purposes during the wet season while they ration the available water from the stream for other domestic purposes during the dry season.

Table 1: Access to and use of water in Agele and Mogba communities

	Water Sources/Season					
	Well Wet season	Dry season	Rain Wet season	Dry season	Stream Wet season	Dry season
Water use for domestic/agriculture						
Drinking	Yes	x	Yes	x	Yes	Yes
Cooking	Yes	x	Yes	x	Yes	Yes
Household chores such as washing and bathing	Yes	x	Yes	x	Yes	Yes
Agriculture	x	x	Yes	x	Yes	x

Agriculture which is the major livelihood of the people in the study area is seriously affected as a result of their poor access to sufficient water as farming activities are suspended during dry season in order to give priority for basic needs such as drinking and cooking. Participants noted that water availability worsens during dry season, as the stream usually dry up, leading to shortage and water crisis. One of the participants in the focus group discussion reported thus:

“There is nothing as disturbing as lack of water in this community. When we do not even have water to drink, how do you expect us to utilise the available one for agricultural purpose”

Another participant from Mogba community also explained how the difficulty of accessing water especially in the dry season had resulted in conflict between community members as follows:

“Fights usually occur between the Fulani herdsmen and the other ethnic groups in the community because the water is not usually enough for household and agricultural use, and the Fulani will want to feed their cattle with the limited water and so this caused quarrel in the community. At times, we use cutlass to chase the Fulani and their cattle”

In terms of quality of the water sources, observation reveals that both the well and stream water were in a poor condition for safe consumption. For instance, the well is uncovered predisposing the content to dirt and contamination by microorganisms. Also, the stream water is unclear and turbid. Unfortunately, no serious treatment procedures are undertaken to purify the water before use apart from occasional manual sedimentation and treatment with alum as explained by the respondents. Many noted that they drink the water directly. The high level of disparity between urban and rural areas in terms of maternal mortality, neonatal deaths, epidemic outbreak and spread (Ishaku et al, 2011) are not unlikely to be connected to the rural people’s lack of access to basic needs of life among which is safe water (Alemu, 2017). Akpabio (2017) posited that a lineal and interlocking connection exists between water, sanitation, and diseases; and that water mediates the transmission of micro-organisms or parasites onto humans.

Furthermore, discussions on community’s waste management practices reveals a connection between rural access to water and hygiene (Table 2). Participants in the focus group discussions indicated that they practice open defecation as neither latrine nor modern toilet was available in any of the



communities. The lack of latrine was not only due to financial constraints but also due to lack of water which is needed to run the facilities. This situation has a potentially negative effect on the people’s health as the excreta could be washed off from the soil and carried during rainfall into the stream where drinking water is fetched. Open defecation results in a polluted environment in which diseases spread fast (WaterAid, 2016). World Health Organization

(2011) also stated that poor management of human excreta creates a serious health risk associated with the potential contamination of local water sources. Agricultural wastes such as crop residue are left on the farmland to decompose while animal waste such as dung and droppings are also disposed in the open on the farmland. Household wastes are usually disposed on dumpsites and occasionally burned during dry season.

Table 2: Common waste management/disposal practices in Agele and Mogba communities

Waste type	Disposal methods			
	Water bodies such as river	Rainwater/flood	Burning/dumpsite	Bush
Human waste (excreta)	X	X	X	✓
Household waste	X	X	✓	X
Agricultural waste (crop residue, poultry dung)	X	X	X	✓

WASH related social, environmental and health challenges faced by Agele and Mogba communities

Problem tree analysis was conducted during the focus group discussions to ascertain the WASH related challenges faced in the communities. Respondents indicated the root causes of their WASH challenges to include lack of safe water, poor transportation, lack of sanitation facilities, poverty and inadequate government support. The effects of these are seen in major health challenges such as hunger/starvation, fever, blur sight, dizziness, ulcer, body rashes, skin diseases, stress and fatigue. Environmental effects include air and water pollution arising from unsafe waste disposal while social effects include neighbourhood conflict due to competition for scarce water resource, migration, skipping of bathing, meals and delay in washing of plates/clothes in order to manage water.

The women who are mostly involved in fetching water from the stream mentioned stress and fatigue resulting from the long-distance trek to the stream and back home as one of the challenges they face relating to their poor WASH situation. Delay in household meal preparation and occasional skipping of meals during dry season when water access becomes very difficult was also indicated by most of the men as one of the resulting challenges from lack of water in their communities. The combined effects of the stress/fatigue involved in search for water and skipping of meals have often resulted in cases of hunger, ulcer, aging, and conflicts with neighbours in the study area. There were also reports of temporary migration in extreme cases to the town in order to cushion the harsh effects of lack of water. Some of the participants at the focus group discussions were quoted as follows:

“There was a time I could not prepare meals for my children for two days, so I decided to

beg for water from people on queue at the stream but on my way back, I began to feel dizzy, then I collapsed, and the water eventually spilled. I thank God there were people around to rescue me”

“The water situation especially in dry seasons is really distressing. We wear clothes repeatedly, even up to a week before washing. My household take turns in using dishes to eat and sometimes, we gather to eat from the same dish so as to minimize water use for washing dishes.”

“We don’t bath every day during dry season because we don’t have access to water, so we skip bath by bathing at the interval of three days or more. At times, we stay a week without bathing and then go to town at the end of the week to have our bath and wash our clothes”

“The struggle for water during dry seasons usually leads to conflict. Our children sometimes fight with one another for water. There was a time when some families left this village to reside temporarily with relatives in town during dry season because of water scarcity”

**Community-led WASH interventions in the study area and support needed for enhancement
Community-led interventions in study sites and lessons learned**

Participants explained that they organise together every year during the peak of dry season to dredge the stream by scooping off excess sand from the surrounding in order to improve flow of water. This collective effort carried out annually has been helpful in reducing the scourge due to lack of water in these communities. Participants also explained that narrow foot-path access road linking the communities to the stream is constantly being maintained through communal effort. Participants’ commitment and cooperation shown in the dredging of the stream and maintenance of the village-to-stream road compared with their more reserved

approach towards the supply-driven well project in the area amplifies the argument for community-led approach in development intervention in order to guarantee sustainability (Im and Rosenberg, 2015). It was obvious from the participants' responses that the well project was not owned by the people and consequently, no serious effort was channelled by the villagers to complete the project from the point at which it was abandoned. Members of the community only draw water from it during the rainy season when it only produces, and they afterward abandon it for their stream until the next wet season. It was garnered during the focus group discussion that the well project was started by a politician (probably for cheap political goal) who did not carry the people along as expected. Unfortunately, the project (well) was hastily completed without reaching the required depth necessary to produce water all year round. Thus, the well project that could have been a great relief from the water scourge experienced by the villagers has unfortunately left them without much difference on their water access and use.

While the idea here is not to rule out the importance of external trigger (such as individual donor or governments support) for eliciting a positive behavioural change towards WASH, the overarching argument however is that participatory approach should be embraced, and adequate efforts should be allowed to generate appropriate response from the people after triggering before support activities are implemented. This is consistent with the recommendations of Community Led Total Sanitation (CLTS) model of Kamal (Kar and Chambers, 2008) and the central argument of self-help initiatives or development (Ebong et al, 2013).

Furthermore, key informants' interviews with some community chiefs also revealed that there are locally enshrined laws prohibiting dumping of refuse, defecating and bathing in and around the Opeke stream which serves as the major water source for the community. The community mobilisation and enactment of laws to safeguard their source of water are consistent with the "carrot and stick" response at the triggering stage of Community-Led Total Sanitation process as envisaged by Kar and Chambers (2008). We understand that the laws have been effective in reducing the extent of abuse of the water resource. It thus implies that if the necessary follow up and

support activities are secured by the communities, achieving adequate hygiene and sanitation will become less difficult and sustainable. It is important to note that post-field follow up to the study sites reveal that the communities are now working with a local non-governmental organisation named Rural Nurture Initiative (RNI) to support their efforts.

Support needed to boost sanitation and hygiene efforts in study sites

The outcome of the pairwise priority ranking of supports needed by the communities to enhance sanitation and hygiene within their localities is presented in Table 3. The Table shows that the priority of the people was assistance to site a well or borehole in order to guarantee an easier access to water for domestic and agricultural purposes. This was followed by road and sanitation facilities such as toilet. However, respondents did not consider support in terms of building of schools and provision of agricultural loans as very urgent. A community chief in Mogba while emphasising on their priority for water support amongst other needs stated that:

'We don't need money or school; it is when our children are able to eat that they will be able to go to school. If the government should give us money, we will collect it and spend it but our water problem will still remain. Water is more important to us now than any other thing'.

For effective sanitation at any level, water must be available. This collective preference for support in the form provision of bore hole or well among the respondents even in the face of enticement of money (loan) which ranked least on their scale of preference, showed their willingness to adopt good sanitation practices if they have improved access to water. Perlman (2017) asserted that water plays crucial roles between hygiene and sanitation interlinkages. Similarly, Chipp et al (2011) noted that rural people are not oblivious of their challenges and needs, but only require support to solve their problems by themselves. Development practitioners should therefore understand that they cannot assume to know what the problems of the rural people are more than the people themselves. This further amplifies the need for consultation with the people and their involvement in designing and implementing development interventions targeted at their environment.



Table 3: Priority ranking of support needed in the study area to improve their WASH conditions

Needs	Rank
Loan	6 th
Accessible road	2 nd
Health care center	3 rd
Borehole/well	1 st
Primary school	5 th
Sanitation facilities such as toilets	4 th

Framework for understanding WASH challenges and community-led actions in the study area

Figure 1 presents a framework for understanding the WASH challenges and the community-led actions in the study area. Poor WASH facilities resulting from inadequate access to water and lack of toilet facilities had meted hardship conditions such as conflict on the villagers. In addition, poor hygiene behaviours such as open defecation also became common, worsening the hygiene conditions and general wellbeing of the people. Following these triggers, collective community action utilising the village level social capital led to the establishment of measures for shaming and discouraging poor hygiene behaviours. This positive village-level response to natural triggering resulted in a collaboration between the

community and a non-governmental organisation (Rural Nurture Initiative-RNI). The combined effects of the collective community action and the external support from RNI or a local authority has the prospects of sustaining positive behavioural change. There are two major paths connecting community-led intervention and sustainable sanitation. First, community-led intervention can enhance hygiene-related behavioural interventions which can prove effective in eliciting improved knowledge and practices around water-sanitation-hygiene interrelationship. Second, community-led intervention can attract genuine governmental or non-governmental agency’s support. The findings in this case study aligns with Bissong and Elliot (2014) study on social capital and improvements in health, environment and development.

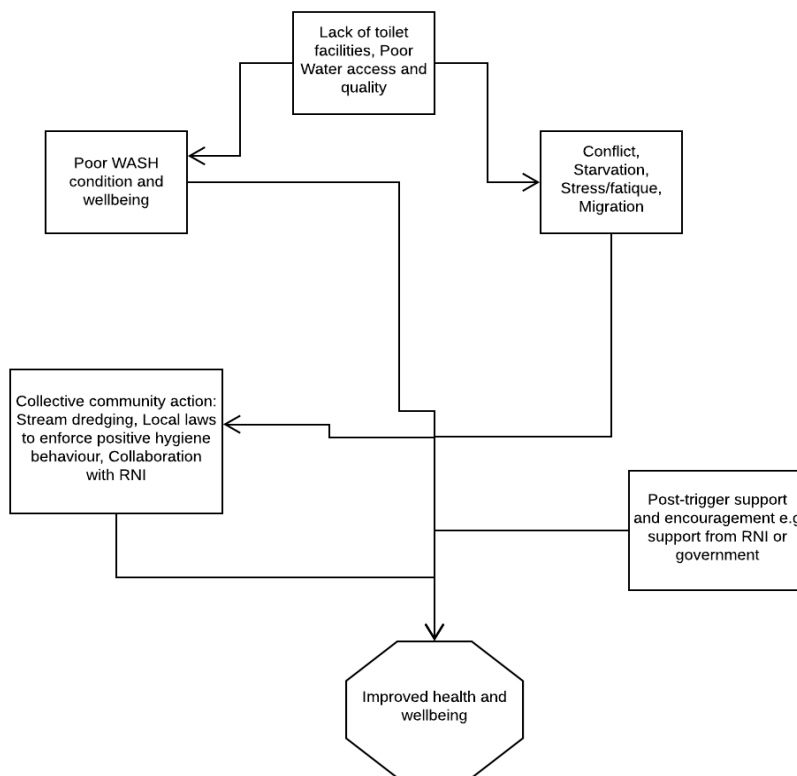


Figure 1: Framework on WASH challenges and community-led actions in the study area
 Source: Authors

CONCLUSION AND RECOMMENDATIONS

Poor WASH condition in rural areas has implications for household food security, sustainable rural livelihoods, health and overall wellbeing of the people as access to water remains critical in achieving sanitation and hygiene in rural settlements. Nevertheless, the people are willing to adopt good sanitation practices if they have improved access to water combined with the right trigger. Mostly, people in the rural communities are aware of their WASH challenges but they exhibit varied levels of collective community action towards promoting self-help interventions, depending on the strength of their social capital. Therefore, rural capacities to effectively respond to their water and sanitation challenges could be weakened by widespread poverty, hence, they tend to require external trigger or support to achieve sustainable solutions. While external rWASH interventions could grant impetus to community-led efforts, their effectiveness however depends on the extent of social inclusion and involvement of the local beneficiaries from the project identification till completion. Furthermore, promoting community-led WASH efforts in rural areas requires that poverty alleviation initiatives that would ensure improved income generation and enhanced social capital are given priority attention in rural development efforts of the government. This will enhance rural populace capacity to form self-help groups and embark on community-led micro-projects that can have far reaching impacts on their wellbeing before external support which usually take a long time is secured.

REFERENCES

- Akpabio, E. M. (2017). Water, sanitation, hygiene and public health: some fundamentals. *WASH Insights*, 8pp.
- Alemu, A. M. (2017). To what extent does access to improved sanitation explain the observed differences in infant mortality in Africa? *African Journal of Primary Health Care and Family Medicine*, 9(1), 1-9.
- Anyanwu, J. C. (2013). The correlates of poverty in Nigeria and policy implications. *African Journal of Economic and Sustainable Development*, 2(1), 23-52.
- Chipp, C., Dewane, S., Brems, C., Johnson, M. E., Warner, T. D., & Roberts, L. W. (2011). "If only someone had told me...": lessons from rural providers. *The Journal of Rural Health*, 27(1), 122-130.
- Ebong, F., Otu, J., & Ogwumike, F. (2013). Self-help initiatives and the development of rural communities in Nigeria. *Research on Humanities and Social Sciences*, 3(12), 2222-1719.
- Fadairo, O.S. (2017) Climate change projects aren't working because communities are left out. The Conversation Newsletter. Retrieved December 7, 2018 from <http://theconversation.com/climate-change-projects-arent-working-because-communities-are-left-out-71905>
- Fadairo O.S and Yahaya. M.K. (2010). Effectiveness of the CDD approach for facilitating grassroots development: lessons from the Local Empowerment and Environmental Management Project (LEEMP) in Nigeria. *The Nigerian Journal of Rural Extension and Development*, 3: 1-8.
- Fadairo, O. S., Olutegbe, S., & Eforuoku, F. (2018). Agricultural Markets as Drivers of Rural-Urban Interdependence: Lessons from Selected Produce Assembly Markets in Oyo State, Nigeria. *Rural-Urban Linkages and Sustainable Development in Africa: Spears Media Press LLC, Denver*, 93-121.
- Federal Ministry of Water Resources (2015) Nigeria Overview: Water, Sanitation and Hygiene. Retrieved November 18, 2018 from http://sanitationandwaterforall.org/wp-content/uploads/download-manager-files/2017%20Nigeria%20Overview_final.pdf
- Hutton, Guy (2015). Health impact and economic cost of poor water and sanitation. *Water and Health*, Vol. I, 5p.
- Harlin J., Kjellén. M, Tropp. H., Connor R., Talafre J., Peloffy K., Hasan E. and Dumont M. (2015). Poverty and social equity. The United Nations World Water Development Report 2015. Retrieved January 21, 2020 from www.unescap.org/sites/default/files/_WDR-2015
- Im, H., and Rosenberg, R. (2015). Building social capital through a peer-led community health workshop: A pilot with the Bhutanese refugee community. *Journal of Community Health*, 41(3), 509-517.
- Ishaku H. T., Majid M.R., Ajayi A.P., and Haruna A. (2011). Water Supply Dilemma in Nigerian Rural Communities: Looking towards the Sky for an Answer. *Journal of Water Resource and Protection*, 3: 598-606.
- Kar, K. and Chambers, R. (2008) *Handbook on Community-Led Total Sanitation*. Plan UK, London, UK
- National Population Commission. (2013). *Nigeria demographic and health survey 2013*. National Population Commission, ICF International. Retrieved December 7, 2018



- from
<https://ngfrepository.org.ng:8443/handle/123456789/3139>
- Ojo, J (2017). Reversing Nigeria's deplorable water and sanitation situation. *Punch Newspapers*, October 11.
- Omoniyi, B. B. (2018). An examination of the causes of poverty on economic growth in Nigeria. *Africa's Public Service Delivery and Performance Review*, 6(1), 1-10.
- Proctor, B. D., Semega, J. L., & Kollar, M. A. (2016). Income and poverty in the United States: 2015. *US Census Bureau, Current Population Reports*, 14.
- Pruss-Ustun, A., & World Health Organization. (2008). *Safer water, better health: costs, benefits and sustainability of interventions to protect and promote health*. World Health Organization.
- Sesay, Mustapha (2012). Poor sanitation and its consequence. Retrieved 18 January, 2020 from
<https://washjournalists.wordpress.com/2012/01/18/poor-sanitation-and-its-consequences/>
- The Guardian (2012) Water and sanitation still not top priorities for African governments. Retrieved October 12, 2019 from
<https://www.theguardian.com/global-development/2012/aug/30/water-sanitation-priorities-african-governments>
- The News (2017) Ibadan: Tale of a Dirty City. Retrieved October 10, 2018 from
<https://www.thenewsnigeria.com.ng/2017/02/ibadan-tale-of-a-dirty-city/>
- UNICEF (2014). Water sanitation and hygiene: the situation. Retrieved December 12, 2020 from
<https://www.unicef.org/nigeria/wes.html>
- Walker, C. and Logan, C. (2016). Africa is failing to close the gap on providing water and sanitation. *The Conversation Newsletter*. Retrieved August 16, 2020 from <http://theconversation.com/africa-is-failing-to-close-the-gap-on-providing-water-and-sanitation-58820>
- WaterAid (2016). Nigeria's sanitation crisis: 2016 World Toilet Day Nigeria supplement. Retrieved November 29, 2020 from URL <https://washmatters.wateraid.org/>
- World Health Organization (2011). Disaster risk management for health: water, sanitation and hygiene. *Disaster Risk Management for Health Fact Sheets, Global Platform – May 2011 Cyclone, Luzon, Philippines, DOH/WHO*. Retrieved January 17, 2020 from
http://www.who.int/hac/events/drm_fact_sheet_wash.pdf