

Nigeria's water and sanitation: spaces of risk and the challenges of data

By

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Presented at the XVth World Water Congress, Edinburgh, Scotland: 25-29 May, 2015

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Introduction

Global interest on 'safer water' and 'improved sanitation' coverage has long been sustained by their capacity to trigger public health problems as demonstrated by several scientific conclusions (Curtis et. al 2011, Cairncross et. al 2010, White et. al 1972, Esrey et. al 1991, Khan 1992, Bradley 1977). The very formal and most popular framework that reflected the consensus of the global community at mainstreaming Water and Sanitation issues into the international development agenda came at the instance of the United Nations Millennium Development Goals (MDGs) which proposed to halve, by 2015, the proportion of the world's population without access to clean water and adequate sanitation. This framework has become the basis for producing statistics by government agencies and other public bodies relating to global water and sanitation access most especially for the developing countries (We use official statistics to refer to numerical data collected and published by government agencies or other public bodies such as international organizations).

Official statistics, while capable of indicating levels of coverage and access, hardly address some fundamental theoretical and methodological issues of cultural and socio-economic characteristics of people in developing countries. The processes in which official statistics are churned out may not entirely reflect the realities of complex people, culture, geography and environmental contexts. Most processes for generating such statistics in developing countries use documented infrastructures in given settlements to estimate access without accounting for actual utilization, functionality, sustainability and potential for their long-term usability. There are also related problems of cultural and socio-economic circumstances that likely could lead to strong influence on attitudes and evaluation capabilities of the respondents/users and potential users regarding certain types, characteristics and quality of available infrastructures.

The integrity of official statistics has, of recent, been tested on water and sanitation access and coverage for developing countries. In Brazil, Johansen et. al (2013) discussed the discrepancies in official statistics that classified the municipality of Caraguatatuba as having over 95% of coverage, when in actual fact, the city is constantly troubled by irregular supplies and access which force excessive household water storage. Such water storage practice, the authors noted, have been associated with the difficulty and inability to control dengue epidemics. The authors further argued that available statistics relating to access to water and sanitation hardly accounts for water quality problems as well as inefficient waste management situations. Almost similar claims have been made by Saravanan (2013) regarding access to water and sanitation in the city of Ahmedabad, India.

A review by Briscoe et. al (1990) on rural water supplies in Brazil argued that ‘improved’ systems often do not function the way they are often statistically projected. The report noted that generally one in four systems hardly works at any one time, and that the number of systems being abandoned is approximately equal to the number of systems being commissioned. In Côte d' Ivoire and Kenya, for instance, the report noted that only one third of the population reported to having access to improved facilities actually used them. In rural communities in Zimbabwe, Robinson (1988) observed that protected wells were perceived as being little more than a marginal improvement over the traditional open wells, and, given the many alternative uses for their money, on average families indicated that they would pay less than 0.5 percent of their income for the improvements. For the rural communities in the Indian state of Kerala, Singh and Ramasubban (1989) observed that the existing level of service-public taps-was much too low. Many families were prepared to spend higher tariffs for a reliable yard tap supply (see Briscoe et. al 1990: 117).

Fundamentally, official statistics on water and sanitation access depends on approaches that often ignore choices anchored on cultural perceptions and religious beliefs (Sheat 1992, Madan 1987, Barnabas 1982). What is often perceived by respondents as good quality water, for instance, most often does not take into account chemical, organic or bacterial pollutants, yet simple interview techniques do not delve into these complexities. Consequently, official statistics depending on respondents’ judgments of access in developing countries may not reflect practical realities and standards. This topic is framed to advance a better understanding on the integrity of such statistics on water and sanitation related to developing countries. To what extent do official statistics on coverage and access reflect actual experience and ground realities? The paper uses Akwa Ibom state to evaluate the extent to which official statistics on water and sanitation access and coverage conform to actual reality and experiences. We also attempt to highlight the challenges surrounding the processes for generating water and sanitation statistics in ways that is expected to shape theoretical and methodological discourses. The paper is organized into sections. Immediately following the introductory section is a discourse and description on the geography of the study area as well as the methods of research. The third section uses different subsections to present some empirical findings bordering on current reality vis-à-vis official records on water and sanitation improvements. The section equally discusses issues bordering on the integrity of official statistics and the complexities behind its processes. This is followed by concluding remarks.

Description of the Study Area

Akwa Ibom state, located in south-south Nigeria, has three major ethnic groups namely Ibibio, Annang and Oron with a total population of 3,920,208 spread across a landmass of 7,081 km² (NPC 2006). A state in Nigeria's oil rich Niger Delta, Akwa Ibom state shares its southern boundary with the Atlantic ocean which, to a large extent, contributes to shaping and influencing the livelihood activities of the coastal settlements. Its being a State within the Nigerian State means every national public policy on water and sanitation is, accordingly, reproduced.

Based on soils and land use surveys (AKS, 1989), Akwa Ibom state is divided into 3 hydro geological areas based on the regional water table. They include: (A) the South (Ikot Abasi, Eket and Oron local government areas with water level accessible at less than 40 m). The south happens to be an area dominated by onshore/offshore petroleum oil exploration with such major oil multinationals (Shell, Exxon Mobil, Agip, Elf and Total) whose activities pose pollution problems to available sources of drinking water. It is also constantly washed by the southern Atlantic ocean; (B) the Middle (Uyo, Etinan, Abak, Essien Udim, Oruk Anam, among others) with a water level values ranging between 40 and 55 m. As coastal plain sands, the lithology of the area is very favorable for the storage and extraction of groundwater. Consequently, private and commercial borehole engagement are very common in this region, especially taking advantage of high urban and consequent demographic growth; (C) and the North (Itu, Ini, Ikono, northern part of Ikot Ekpene local government areas with the water level values greater than 55 m). The northern boundary of the aquifer is formed by the impervious clays and shale of the Ameke and Imo shale formations (AKS, 1989). This geological condition makes it difficult for ground water extraction and where such extraction is possible, there is the other problem of mineral-based water pollution.

Over 80% of the population are estimated to live in rural areas and are involved in semi-subsistent agriculture and related activities including trades, skilled crafts, commerce and other important livelihood occupations (Okoji 2000). Several land holding systems have been recognized in rural Akwa Ibom State (Ekong 2003). The most important ones with implications for water resources management and sanitation practices include individual holdings (*Okpokpo Ikot or Ndedep Ikot*); secret society land (*Owok Ekpe or Owok Nka*); and sacred groves (pieces of land dedicated either to deities or for the disposal of those who did not die in the proper manner). Individual holdings imply right of ownership of all available groundwater under the land area according to the Land Use Act of 1978, while surface water, notwithstanding the types of land holding system, belongs to the community. Water bodies found in sacred groves or secret society lands carry the same treatment as the land itself, such as restricted entry and persistent religious and symbolic rituals. In all ramifications, there is a blending of some basic elements of the traditional and Christian beliefs, and the Christians most often respect and are subject to the traditional institutions of governance especially in the rural areas.

Daily water supplies either come from the natural sources (rivers/streams, ponds, rain, and hand-dug wells) or modern supply sources (public sector and private or commercial supplies). Access to public water and sanitation services remain poor for both the urban and rural areas (Nyong and Kanaroglou 1999; Stoveland and Basse 2000; FGN 2000; Sanusi 2010). More so, water supply services in general are not planned in a way that integrates or incorporates sanitation concerns. Such absence of coordinated planning implies that while one sector, mostly water supply, seems to receive some attention, the sanitation sector remains largely unattended

to. This means that sewage and sullage in urban areas either lie stagnant or are disposed through the storm water drainage system. Official records on access and coverage for water and sanitation for Nigeria largely remain confusing and highly contradictory (Nyong and Kanaroglou 1999, Salaam-Blyther 2012, Sanusi 2010, WHO/UNICEF 2010). Given that water and sanitation situations in Nigeria are determined by several interrelated factors a study that attempts to empirically highlight coverage and access situations will contribute in deepening understanding of the true situation beyond what is reflected in official statistics.

The Research and the Procedures for Arriving at Findings

This paper draws on data from four different research opportunities. Two specific doctoral studies on this theme significantly established the extent of water and sanitation coverage for Akwa Ibom state (Udom 2011 and Ansa 2013). The third opportunity for data came from a project specifically on water and sanitation choices for coastal dwellers in Akwa Ibom state (Akpabio and Brown 2012). Follow-up interviews, observations and further data collection were conducted in 2013 and 2014 (with the assistance of some MSc students on the subject) to reconcile issues of discrepancies, note progress and strengthen available data base. The lead author's over 4 years research experience on water, sanitation and hygiene practices in southern Nigeria was very helpful in data and literature (see Akpabio 2012a, Akpabio 2012b, Akpabio and Subramanian 2012, Akpabio and Brown 2012 for full description on methodologies). Specifically, the lead author was the leader in a research team for the survey of environmental problems in Akwa Ibom state (funded by Nigeria's Niger Delta Development Commission- NDDC- in collaboration with STILL Waters limited, Port Harcourt, 2009-2013). These diverse academic, research, consultancy and experiential backgrounds have contributed to shaping the focus of this paper. The funding opportunity offered by the Japanese Society for the Promotion of Science (JSPS) enabled the actual analysis, data extrapolation and aggregation, synthesis, further literature research and writing-up of this paper.

Two key limitations need be highlighted. First, though some quantitative data sets were extrapolated, the significant part of the discussion on these issues is largely qualitative as the greatest proportion of available data was estimated through discussions, interviews and observations. Second, as the study is focused on Akwa Ibom state (one of the 36 states in Nigeria), this paper acknowledges that data from Akwa Ibom state alone may not give adequate representation of the complex environmental, socio-economic and cultural diversities of the Nigerian state. In spite of these limitations, this study is very important and has the potential to contribute to the global debates on progress relating to water and sanitation practices in developing countries.

Findings

Relative access to water and sanitation elements reflected State priorities, environmental contexts and socio-economic and cultural circumstances for urban, rural and the coastal communities in Akwa Ibom state. All the areas and respondents claimed access to drinking water though at different levels of sources, perceptions, quality and costs. Access to sanitation and sanitation facilities significantly varied between the three focus areas. Sanitation facilities graduated from household private sewer system in selected urban areas to pit, open defecation and 'wrap and throw' in some urban spaces as well as the rural and coastal areas. Discussions on these are segmentally organized to reflect situations at the three domains.

Urban Water and Sanitation Perspective

For the major urban areas in Uyo, Eket, Abak, Etinan, Ikot Abasi, Ikot Ekpene, Itu and Oron, public drinking water supply services could only cover between 0.1% and a maximum of 3.8% of the urban population between the periods 2001 and 2006. While Itu urban recorded consistently the least coverage figure of 0.1% under the period, it was only Uyo urban (capital of Akwa Ibom state) that recorded the highest figure of 3.8% coverage level (2004-2006), and this was related to its status as the administrative capital of Akwa Ibom state (Table 1).

Table 1. Percentage of Urban population served by AKWCL (2001-2006)

Urban LGA	2001	2002	2003	2004	2005	2006
Abak	0.7%	0.7%	0.7%	0.7%	0.1%	0.1%
Eket	2.1%	2.1%	2.2%	2.2%	2.2%	2.2%
Etinan	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%
Ikot Abasi	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%
Ikot Ekpene	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%
Itu	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Oron	1.3%	1.3%	1.4%	1.4%	1.4%	1.4%
Uyo	2.3%	2.3%	1.1%	3.8%	3.8%	3.8%

High quality residential areas tended to receive high priorities as public water services within the period exclusively served the public housing estates and high residential areas and streets mostly occupied by high ranking public officials and the business class. Beyond such areas, public water services diminished giving way to massive dependence on private and commercial water services as well as natural sources (rain, streams, ponds and hand dug wells).

Having access to urban public water services did not translate to regularity of supply. All the respondents agreed to this fact as some still maintained their private channels of water supplies while few others equally depend on commercial and natural supplies as complementary sources. Different categories of services were identified among the respondents as ‘regular’ and ‘irregular’. Only 14% of the respondents indicated that they had regular water supplies. By the standard of the respondents, ‘regularity’ did not imply 24 hours of supply but measured sometimes on other indicators, for instance, weekly flows and limited visits to other sources of supplies. A male respondent (in his early 50s) observed: *‘if we are able to have water three times in a week, it is fine and even more than enough...we can store some water in tanks and containers to serve us the rest of the days...’* Respondents who claimed ‘irregularity’ in services said they can stay several days and weeks without supplies, and this did not have any effect on monthly billing commitment: *‘it does not matter whether you have water in your home or not...at the end of the month...you still have to pay the bill...we have no choice...’*, so said one male respondent in his early 40s. Several cases of irregularities, high cost of initial participation, low and selective coverage and general poor services were used by the respondents in downgrading the public water services provision. For instance a male respondent in Uyo (in his

early 40s) gave insight into the problem as follows: ‘...now before you are linked into the public supply network you have to have an initial capital of not less than #30,000 (\$187.5)...for a person like me...with family members...who may not earn up to #20,000 (\$125) such amount is like asking me to steal...I can’t save such money...even if you can afford it, the services are such that you still have to keep spending extra money to buy water from commercial operators...it is better to spend daily to buy water from the commercial vendors...’ Apart from the initial high cost of being linked into the public network, the respondents were not even assured of regular public supplies given the general complaints of irregular public water services by those who use it.

For sanitation, access still depended dominantly on pit latrine. Field data showed that 85% of the respondents still used the pit system of toilet across the urban areas. About 8.7% used the in-house flush system while a little above 5.3% claimed they depended on open defecation. Only 1% indicated ‘others’, which could be river or ‘wrap and throw’ methods (Table 2).

Table 2. Household Sanitary Disposal Facilities for Urban Areas

Disposal Facility	A (Eket) (%)	B (Uyo) (%)	C (Ikot Ekpene) (%)
Pit latrine	91	69	95
Open field	2	12	2
Flush Toilet	6	17	3
Others (e.g., river)	1	2	0

All the urban areas do not have public sewerage sanitation system. Sanitation practices (toilet system) generally depend on individual provision, mostly determined by income and wealth. Public sanitation efforts mainly centered on street cleanliness, evacuation of drains and urban waste management practices.

Rural Water and Sanitation Practices

Rural areas only depend on the natural sources of water for drinking, domestic and other social, economic and cultural needs. Across the three distinct hydrogeological areas (A, B, C) natural sources of water supplies come from stream, rivers, rain, hand-dug wells and ponds. Apart from rain water (which occurs in rainy season), all communities visited depend on some walking distances to access other natural sources of water. In Udung Uko (southern zone) for instance, distance to stream sources could range between 2000 meters and 4000 meters depending on the relative location of a household. For Ini area (northern zone), average distance could range from 600 meters to as long as 3000 meters for Ananamong and Nsanabua, while communities in Nsit Ibom (Afaha Nsit and Afaha Abia) in the middle zone could access natural sources of water supplies at distance ranges of between 200 meters and 1000 meters.

Various means of transport including bicycle, motorcycle, wheel barrow, and vehicle are important for transporting two or more containers of water depending on the relative location of a household. A male respondent at Ediko (in his early 20s) said it takes about 6 minutes bicycle ride to the nearby stream to fetch water for household use-an everyday task for him and his younger brother. Households living close to natural sources of water depend on foot walk,

usually with a container on the head. Few public (100% government owned) or semi-public (joint project with communities) water services were located in these communities. At Ananamong and Nsanabua, only one public water scheme was identified; same status was recognized for Eyokpu and Ediko (one public water scheme) while Afaha Nsit and Afaha Abia had two public water schemes. None of these schemes functioned to their optimum capacities. At Ananamong and Nsanabua (Ini) for instance, the project is currently at abandoned state as the drilling machine of the State rural water and sanitation agency (AKRUWATSAN) was confiscated by the affected communities for inability to successfully execute the scheme for which the communities were involved in financing. The only functioning public water scheme at Nsanabua was located at the private compound of a former political representative, and whose service depends entirely on the goodwill of the Politician (funding for service operation and maintenance). At Nsit Ibom, a total of 9 water supply schemes were counted with only 5 of the schemes (about 55%) identified as still functioning though with highly irregular services, according to the respondents. While irregular public power supply was blamed for the corresponding irregularity in the water schemes, the availability of several natural sources of water supplies (at short distances) minimized undue and heavy dependence and interest on available public water schemes. It is equally possible the relatively functional status of most of the schemes has to do with the presence of the Akwa Ibom State College of Education which seems to influence government interests in their sustenance.

Rural public water schemes in Akwa Ibom state are mostly packaged in the form of boreholes. Statistics and field data indicate that approximately 113 public rural water projects (the highest) are available for zone C (the northern part of the state), followed by about 88 projects for zone B (the mainland) while zone A (the southern areas) has the least of 69 public water projects. Zone C records extremely very few and highly irregular and unreliable supply services made possible through private goodwill (as in Nsanabua) or community efforts. Although zone C records the highest frequency of public water projects than zone 'A', fieldwork result showed that there are relatively very few functional public water infrastructures in zone 'A' than 'C'. Such discrepancy mostly has to do with seasonality and pollution challenges in zone 'A' than 'C'. Zone 'C' has the optional advantage of resorting to natural stream sources (which are relatively of improved quality) over zone 'A'. This probably explains why efforts were made to sustain the survival of some public water infrastructures especially in areas where water problem is most acute. Zone 'B', on the other hand falls within easy reach of ground water, giving rise to all forms of public and private interest in exploitation. Zone 'B' equally has the advantage of being relatively urbanized over other zones (Uyo, the administrative capital of Akwa Ibom State, is within this zone). Public water supplies and investments for this zone are organized by different water agencies and private interest etc. Even with the presence of these diverse service providers and interest, it was observed that the greatest number of people still depend on private/commercial water sources owing to the irregularity and poor coverage of the public water schemes.

Rural areas in Akwa Ibom State dominantly depend on pit toilet and all forms of open defecations for disposing of human excreta. Extremely few individuals (about 3%) had in-house flush toilet. The contexts of environments, prevailing historical habits and socio-economic circumstances were mobilized to explain the sanitary practices of the respondents. Relatively well-organized and close or nucleated settlements types tended to be associated with pit toilet systems. About 85% of the respondents had pit toilets either as shared facilities in large

compounds or only for a specific household. Respondents who practiced open defecation were 16%, while the rest of the respondents (about 6%) who could not say of any of the specified methods were classified as 'others'. For such classes of individuals, a combination of 'shallow pit', open defecation, 'wrap and throw' etc play diverse roles in the disposal of human excreta. While pit latrine was recorded as the most important choice for disposing human excreta in the rural areas, most of them were shared among several households (or several members in a household) in a large compound. Shared status of most pits contributed, to a large extent, to the poor quality of such facility. An instance of one large compound with 5 different household units sharing one pit latrine attracted a remark from one male respondent (one of the occupants in the compound, who should be in his late 20s) as follows: '*...you have to wake up early to use the toilet...otherwise you learn to queue for your turn...the other way to escape such queue is to use the nearby bush...if you cannot wait...*' Within this context, the nearby bush serves as a complementary alternative in case of emergency needs.

Water and Sanitation Practices at Coastal Settlements

The sources of water supplies were mixed but dominated by rainwater (through roof harvesting), commercial supplies and complemented by many other sources including the seawater, private system, public supplies and locally dug wells. All the respondents indicated rainwater and commercial supplies as their regular and steady sources of water for various uses. While rainwater was discussed as the most regular source for every activities (drinking, domestic uses, washing), commercial supplies were available options in case of delayed or absence of rainfall. Household economy determines patronage of commercial supplies. The geological condition of the study area is very unfavourable to borehole drilling as the respondents reported of borehole water as colourful, salty and of poor quality even after chemical treatments. Household or individual choices for commercial (borehole) supplies are constrained by a lack of regular alternative especially in periods of delayed rainfall. Given that the cost for a 25 liter of water is fixed at #10 (\$0.06) (Currency conversion rate 1 USD = NGN 160), island settlements such as Itak Abasi and Okoroutip (at the other side of the sea) tends to spend more to access commercial water supplies at Upenekang. The sum of #100 (\$0.6) is spent as transport cost to cross over the sea by boat to Upenekang and back, excluding the cost of conveying the water in containers. Given such hard choices, the respondents admitted having to depend on the sea water and locally dug wells for occasional drinking, bath and washing. Although public taps were found in each of the settlements, they were not supplying water; they carried the status of abandoned infrastructures. For Itak Abasi, the 2010 coastal flood had submerged the only public tap which the respondents claimed were not even supplying water prior to the flooding incident. One woman in her late 30s (at one of the Island settlements) spoke on the water situation in the area and is here translated as follows: '*we depend on rainwater for drinking and domestic activities...we bath and wash in the sea but some people drink the sea water when rainwater is exhausted....as many people cannot be paying to buy water at Upenekang (the other side).*'

The sea not only served as local dominant source of water supply, it was understood to be at the center of sanitation practices. All the respondents admitted the sea has dominated the sanitation practices of the coastal settlements. Virtually every respondent had no toilet facilities in the areas. Consequently, fecal wastes are openly disposed of at the beach and inside the surrounding bodies of water. Three means of fecal wastes disposal were identified as 'wrap and throw', open defecation in the bush or on the sand beaches and controlled defecation (through in-

house toilet system). All the respondents practiced 'wrap and throw' either into the sea or bush; and 'open defecation' either in the bush or on the sand beaches. Only 2 respondents (>6%) maintained in-house toilet systems. There was no respondent with knowledge of the availability of pit toilet system.

Fecal wastes disposal among the population was noted to be determined not only by the spatial distance from the sea, time factor equally was discussed as important. While the two island settlements of Itak Abasi and Okoroutip depended mainly on the sea and available bush for their fecal waste disposal, the nature of Upenekang, to some extent, provided little opportunity for those who could afford to maintain in-house toilet and sanitation facilities depending on location of settlements. For instance, households located in-land away from the sea have the option and opportunity of running in-house toilet system depending on the household economy. The two households who were able to run in-house toilet facilities happened to be the elite members of the area who have their houses a bit far away from the sea. Time elements featured as important determining factor of sanitation behaviors. 'Day or night', 'dry or wet' seasons etc accounted for 'where to defecate' or 'what method to use.' Incidence of 'wrap and throw' was known to be time dependent: 'wrap' at night and 'throw' away in the early hours of the morning for some, especially for safety reasons or 'wrap' at certain hours of the day and 'throw' away subsequently for others, especially those with 'privacy' concerns. For safety reasons, the women and children were discussed as needing more protection. For privacy reasons, the women and visitors were discussed as priorities. This observation seems not so significantly different from the study by Avvannavar and Mani (2008) who observed that women in Africa focused more on privacy and safety when making decisions on where and when to defecate. The authors argued that in such circumstance, the natural environment with bushes and shrubs suits their requirement the most, with the option to defecate in the early hours of the day in the absence of the later.

The most important outcome of human waste practices were excreta materials or fecal wastes either floating on the sea or lying at every walking distance on the sand beaches. The filth were most common at Upenekang side of the settlements than the island settlements of Itak Abasi and Okoroutip. In the wet season, regular tidal washes keep the beaches relatively less filthy than the situation in the dry season. Interestingly, the beaches serve as sporting grounds (for children and adults), eateries, strolling and relaxation as well as providing avenues for diverse economic activities including buying and selling, fishing and points for take-off and landing for local boat transportation. At every visit, the sea was observed to serve swimming, washing and bathing needs of the local settlements. Instance of direct drinking from the sea was not confirmed although some respondents and local informants claimed the inhabitants occasionally drink directly from the sea.

By comparison, the island areas (Itak Abasi, Okoroutip) have relatively better sanitary conditions (largely attributed to natural factors) than Upenekang areas. The availability of bushes and surrounding bodies of water including the Atlantic Ocean provide natural sinks for all sanitary practices. The other side of the islands namely, Upenekang, was observed to be very poor in sanitary condition. A combination of high population (Upenekang has 7856, over three times heavily populated than Itak Abasi and Okoroutip combined), high economic activities (Upenekang provides the major market for the island areas) and limited number of surrounding bodies of water were observed as possible factors for observed differences.

Water and Sanitation Statistics for Nigeria: Current Reality and Official Releases

Clearly, water and sanitation coverage for Akwa Ibom state falls under ‘unimproved’ categories across the urban, rural and coastal settlements. Over 95% of the urban population still depends on natural and commercial sources of drinking water supplies. The highest percentage of the urban population (3.8%) with public drinking water access is located within Uyo urban (the administrative capital of the state) mostly at high quality residential areas (see data for 2004-2006). Beyond Uyo, drinking water access statistics for other urban areas could be as low as 0.1% (Table 1). On the other hand, over 90% of the urban population still depends on pit latrine, open defecation and other unimproved channels of disposing human excreta. Besides high quality residential estates and streets, few individuals maintain good quality houses with in-house toilet system at low residential places, and depend on private or commercial water supplies for domestic sanitation management. One male household respondent who occupied a private 4 bed-room flat in one of such areas discussed how their house sanitation system is managed as follows: ‘...normally everybody has to use toilet in the morning before we flush them at once with available domestic waste water...we are 7 in this flat and it would be challenging to be flushing toilet at every point of use...’ The rural and coastal settlements entirely depend on the natural sources of water, comprising of streams, rivers, ponds, rain, hand-dug wells for drinking and other uses. The sanitation facilities equally passed for generally ‘unimproved’ category, dominated by the pit toilets and open defecation depending on environmental and locational factors.

Available water and sanitation statistics for Nigeria are, however, contradictory. FGN (2000) estimates the ratio of 42% to 29% of urban and semi-urban to rural population as having access to safe drinking water supplies. WHO/UNICEF (2000), NBS (2007) indicated that 72% of urban to 47% of rural populations have access to improved water sources (see Onabolu et al 2011). In Akwa Ibom state specifically, the Niger Delta Environmental surveys (NDES 2000) reported a ratio of 20 - 24% of the rural as against 40-45% of the urban communities are estimated as having access to safe drinking water. Statistics related to sanitation coverage are equally interesting for Nigeria. While the water Supply and Sanitation Interim Strategy note (2000) observed that no urban community in Nigeria has a sewerage system except for Abuja (the Federal Capital Territory) and limited areas of Lagos, Salaam-Blyther (2012) reported that Nigeria made significant progress of 32% in improving sanitary facilities and 58% in improving drinking water access. Geographically, the north central (NC), north eastern (NE) and north western (NW) zones of Nigeria have been reported as having improved drinking water access of 48.9%, 30.7%, 50.6% respectively compared to 73.5% and 40.8% in the south western (SW) and south eastern (SE) zones respectively. On the other hand, 46.6%, 45.4%, 61.6% representing the NC, NE, NW respectively used improved sanitation in comparison to 69.5% and 62.1% in SE and SW zones respectively. The south-south (SS) in which this study is based has 45.9% and 55.0% as using improved water and safe sanitation respectively (see Amakom 2009). While the SW and NW areas are noted as relatively better off than others in access to water supply and sanitation, the SE and SS fare relatively better in sanitation over water supplies than others.

One important outcome of this study was the remarkable opportunity to have insights on the attitudes and behaviors of the respondents. A significantly larger proportion of the respondents have limited education, with very low income background. Majority still lives on goodwill and informal credit system. Attachments to cultural and religious values and beliefs are

still deeply part of the social livelihood system. Consequently, local knowledge and expectation of what should constitute improved water quality or best sanitation practices was less understood among the vast majority. Even after describing what should be the appropriate standard and characteristics, most respondents' knowledge and discussions still reflected poor understanding while others depended on cultural and religious beliefs in explaining their water and sanitation behaviors. Bodies of water were still ascribed with meanings, beliefs and taboos which tended to discount consideration for quality (Akpabio 2012a).

Over 90% seemed not to be bothered about access to improved water as well as the methods of disposing human excreta and related wastes. In the word of one elderly man (in his late 50s) from the coastal settlement of Ibeno: *'we have lived here for ages...and the water has always been serving the same purposes of bathing, drinking, washing from childhood...we depend on it to dispose of all our material and human wastes without any problem...'* Long term experiences of living and socializing in the conditions of 'water and wastes' enable certain pattern of local attitudes and orientation which hardly acknowledge the risks associated with inappropriate water and sanitation behaviors (Douglas 1966, Akpabio and Brown 2012, Akpabio 2012a). Very few respondents (less than 6%) mostly in urban locations, however, displayed some elements of awareness related to the risk of living with 'unimproved' water and sanitation condition. Socio-economic improvements (improvements in income, education, exposure to relevant information etc) probably accounted for such differences.

Concluding Remarks

Clearly, claims of access to water and sanitation system in Nigeria are mediated by perceptions, local cultural knowledge, socio-economic conditions as well as long history interaction with the ecosystem. A broad range of sub-concepts and themes are part of individual and group water and sanitation attitudes. Questions associated with access are most likely to be interpreted from the point of view of quantity than quality (for water) and available opportunities/facilities for human excreta disposal rather than concerns for the quality of such facilities (for sanitation). Most national governments work on the number of public water and sanitation infrastructures at given points and time to estimate coverage and access. The question of wider coverage in water and sanitation infrastructures hardly addresses the related questions of actual use or motivations for use. Official statistics that is anchored on available infrastructures hardly account for functionality, usability, long-term sustainability as well as who benefits from such facilities. On the other hand, researches and surveys depending on responses of individuals are more likely to be fraught with hypothetical and in some cases compliance biases especially if rigorous attention is not given to environmental, socio-economic and cultural contexts. Respondents are most likely to supply answers which depend on their diverse knowledge capacities, values, beliefs and practical experiences, among other factors.

Official statistics on water and sanitation are often produced for diverse purposes and goals, some of which may have some political meanings and implications especially in developing countries. The means and methods of obtaining such statistics, in most cases, not only lack the necessary rigor, they are modeled on procedures often utilized for statistical data collection in industrial and developed economies with stable water and sanitation infrastructures and services that are easily predictable. This paper does not entirely condemn western-based methods of collecting statistics relating to water and sanitation services in developing countries. As this study has shown, several issues relating to socio-economic, environmental and cultural

circumstances influence water and sanitation attitudes, behaviors and practices. Consequently, official assessment procedures hardly recognize these factors. Most methods use isolated cases to generalize for the entire population. The report that only Abuja and limited areas of Lagos have sewerage system, while 35 other States and hundreds of urban centers have none exposes the weaknesses and limitations of excessively depending on official statistics in estimating coverage and access to water and sanitation for Nigeria. Findings from this study reinforces the idea that statistical data collection methods for measuring progress in developing countries should go beyond simple structured models (e.g., simple questionnaires and ‘yes’ or ‘no’ interviews) and over-reliance on official statistics. More emphasis should be focused on deeper engagement with the local respondents to understand not only the reasons behind some responses, but also to have a first-hand assessment of project performance and quality of available facilities. In-depth discussion, focus-group interviews, village meetings, keen observations, elite discussions could serve as important channels at least in very highly complex societies with cultural, socio-economic and development challenges.

Acknowledgement: We thank the Japanese Society for the Promotion of Science (JSPS) and Kyoto University, Japan, whose funding and infrastructural supports respectively enabled the assemblage of necessary data, further literature review and eventual compilation of this paper. The ideas in this paper are, however, of the authors’ and not the institutions named above.

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