Community Awareness and Evaluation of Surface Water Bodies in Osogbo, Osun State, Nigeria

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ABSTRACT: This study covers the examination of socio-economic characteristics of residents, identification of different types of surface water bodies, determination of level of accessibility of those water bodies, the evaluation of the water bodies and the identification of the challenges being faced by communities in Osogbo, Osun State, Nigeria using four hundred (400) well-structured questionnaires. Data obtained were analyzed using frequency counts and percentages with Statistical Package for Social Sciences (SPSS) version 15. Result showed that, 58.3% were married, the male (54.2%) respondents were higher than the females, and the occupation of the majority were informal sector (37.1%). Also, the highest age group was 15-25 years (34.3%) while family size of 2-3 members (61.1%) were higher than the other categories. Educational qualifications ranged from 2.2% - Primary School Certificate holders to 30.5% - NCE/OND/HND (30.5%) graduates. Eighty-one percent of the respondents were aware of the water bodies. River (37.7%) and stream (38.1%) were the major water sources in the study area, and one of the rivers was dammed and used for religious and traditional purposes. The Rate of obtaining the water varied from regularly (19.6%) to rarely (28%) while the Reasons for obtaining water ranged from its natural state (5.9%) to lack of portable water source (27.4%). Approximately fifty-three percent (52.7%) respondents had contacted one disease or the other ranging from bilharzias (6.2%) to malaria (18.1%) due to the use of the water while scarcity during the dry season has often resulted in frequent clashes among most users. Therefore, this study suggests that government and its agencies should provide portable water, care and maintenance of surface water bodies.

Water is the most popular and important liquid for all living things but considered as being polluted when it is detrimental for its planned utilization. Davis *et al*. (2003) reported that the growing demands for water and increased pollution loads threaten the quality of many lakes, rivers, estuaries and groundwater bodies and pose serious threats to public health, agricultural and industrial production, ecological functions, and biodiversity. Urbanization especially in the developing countries makes urban environmental sustainability critical and environmental impacts occurring at an unprecedented rate (Marsalek *et al.*, 2006). With the advent of increasing population and industrialization, the range of requirements for water has increased, together with greater demand for higher water quality (Turdukulov, 2003). The use of water for a variety of human activities include drinking, personal hygiene, fishing, agriculture, industries, transport, recreation and suitable medium to clean, disperse, transport and dispose wastes since the ancient times. The human right to water entitles everyone to sufficient safe, acceptable, physically accessible water environment (Ki-moon, 2010). On 28

July 2010, the United Nations General Assembly *Resolution A/RES/64/292* clearly recognized the human right to water and sanitation and accepted that clean drinking water and sanitation are crucial to the realization of all human rights. Therefore, enhancing surface water bodies in provision of viable, reliable water of acceptable quantity and quality for domestic and industrial uses is essential to healthy living, poverty alleviation and sustainable socio-economic development. However, in many rural communities, the lack of access to water (or inadequate control) contributes to the difficulty of generating acceptable yields. To minimize future human water shortages and undesirable environmental impacts, more equitable sharing of water resources between society and nature is required. This will require physical quantities and social values to be placed on both human and aquatic ecosystem requirements. Current water valuation systems are dominated by economic values and there is need for new quantification and valuation methods that take more account of human well-being and environmental impacts in rural communities of Osogbo. In the light of this experience, it become

compelling and necessary to initiate a study aimed at the public perception and evaluation of surface water bodies in Osun State, Nigeria. Hence, the objective of this study is to investigate community awareness of various surface water body related issues in Osogbo, Osun State.

MATERIALS AND METHODS

The Study Area: Osogbo is the capital city of Osun State. The city seats the headquarters of both Osogbo Local Government (situated at Oke Baale area of the city) and Olorunda Local Government Area (situated at Igbonna area of the city). Osogbo is situated between latitude 7°44' and 7°49' North and longitude 4°30' and 4°35' East, with an area of 47 km² (Figure 1) Osogbo shares boundary with Ikirun, Ilesa, Ede, Egbedore and Iragbiji and it is easily accessible from any part of the State, because of its central nature. The major rivers in the area are: Osun River, Erinle River, and Otin River.
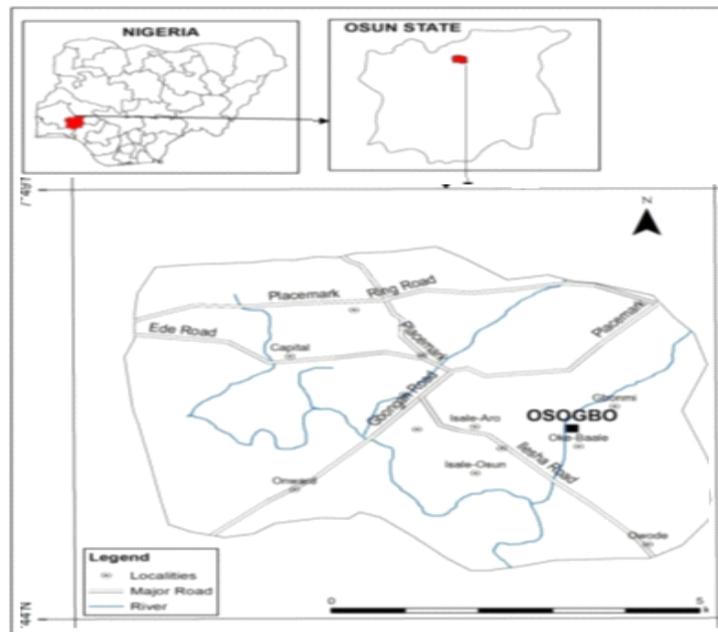

Fig 1: Map of Osogbo showing the study locations.

Data Collection: Primary data were generated from the residents of Olorunda and Osogbo Local Government Area. Four Hundred (400) well-structured questionnaires were administered to the respondents of Osogbo in 2016.

Sampling: The stratified sampling technique was employed for the data collection. The samples were chosen based on the Local Government Areas, Wards, and Residential Location. 200 questionnaires were administered to Olorunda and Osogbo Local Government Area respectively.

Data Analysis: The data collected were analyzed using frequency counts, percentages and cumulative frequency. The data collected was analyzed using Statistical Package for Social Sciences [SPSS] (version 15).

RESULTS AND DISCUSSIONS

Table 1 shows the demographic characteristics of the respondents in Osogbo, in terms of their sex, age, occupation, marital status, family size and educational background. The male (54.2%) were more than the female (45.8%) respondents while the ages of the respondents ranged from 15-25 years (34.3%) to 56 years and above (6.2%). About sixty percent (58.3%) were married while 41.7% were singles. The occupational background varied from unemployed (3.7%) to informal sector (37.1%).The family size of the respondents ranged from 2 to above 10 members but those with 2-3 members were the highest (61.1%). Educational qualifications of the respondents varied from Primary School Leaving Certificate to PhD. Respondents with Primary School Certificate (2.2%) were the lowest while those with NCE/OND/HND (30.5%) were the highest. Table 2 shows the respondents perception of surface water in the study area. About 81.0% were aware of the surface water within their locality while 19.0% claimed they were not. The types of surface water bodies identified by the respondent include river (37.7%), stream (31.8%), rivulets (4.0%), ponds (5.3%) and lakes (2.2%).

ADEJUWON, JO; ADEKITAN, AA; OLADUNMOYE, SL

Table 1: The demographic characteristics of the respondents in Osogbo

Variables		Frequency	%
Sex	Male	174	54.2
	Female	147	45.8
	Total	**321**	**100**
Age	15-25 years	110	34.3
	26-35 years	97	30.2
	36- 45 years	31	9.7
	46-55 years	63	19.6
	Above 56 years	20	6.2
	Total	**321**	**100**
Marital Status	Single	134	41.7
	Married	187	58.3
	Total	**321**	**100**
Occupation	Farmer	76	23.7
	Informal sector	119	37.1
	Self employed	31	9.7
	Civil servant	79	24.6
	Unemployed	12	3.7
	No response	4	1.2
	Total	**321**	**100**
Family Size	2 members	29	9
	3-5 Members	196	61.1
	6-10 Members	58	18.1
	Above 10 members	13	4
	No response	25	7.8
	Total	**321**	**100**
Educational Qualification	Primary school	7	2.2
	Senior Sec School	67	20.9
	NCE/OND/HND	98	30.5
	B.A/B.Sc./B.Ed.	89	27.7
	M.A/M.Sc./M.Ed.	23	7.2
	Ph.D.	23	7.2
	Professional qualification	14	4.4
	Total	**321**	**100**

The use of surface water in the study area is shown in table 3. The reasons given by the respondents for obtaining surface water ranged from preference for the natural state of the water (5.9%) to inability to obtain water from public sources (27.4%) while the rate of obtaining the water varied from regularly (19.6%) to rarely (28.0%). Most of the respondents were not satisfied with the use of surface water as only 31.8% admitted satisfaction. The level of water obtained by the respondents varied from 1-50 litres to more than 500 litres everyday. Only 0.9% obtained over 500 litres while 29.0% fetch 1-50 litres per day. Approximately, sixty four percent (63.6%) claimed that the water bodies were scarce in their environment.

The period of water scarcity ranged from when much people were involved in fetching water (4.0%) to the dry season period (48.6%). Other uses attached to the water bodies include recreation, sports, religious worship, agriculture, fishing and tourism. Those who engaged in recreational (20.9%) and agricultural (20.1%) activities were the highest users while the lowest users were people on tourism (5.6%).

Table 2: Respondents perception of surface water in the study area

Variable		Frequency	%
Awareness of surface water bodies	Yes	260	81.0
	No	61	19.0
	Total	**321**	**100.0**
Types of surface water bodies	River	121	37.7
	Stream	102	31.8
	Rivulets	13	4.0
	Ponds	17	5.3
	Lakes	7	2.2
	No response	61	19.0
	Total	**321**	**100.0**

Table 4 shows the perception of water quality and the method of treatment. The quality of the water obtained was unsatisfactory to the majority (50.2%) of the respondents while 22.1% showed satisfaction. More than 70% of the respondents always purify the water before use. The various methods of water treatment ranged from herbs (2.8%) such as *Moringa oleifera* in treating water to chemicals such as, Alum (46.7%) for purification. However, 11.5% of the respondents adopted the traditional method of use of cloth to sieve their water before drinking. Table 5 also shows the types of diseases encountered by the respondents, other problems and solutions to the problems encountered. About 52.7% of the users of surface water bodies admitted they have contacted diseases such as diarrhea, cholera, malaria, bilharzias and dysentery due to surface water usage, with the variation of 6.2% (bilharzias) to 18.1% (malaria).

The problems encountered ranged from frequent clashes among most users (5.6%) to long distance (29.3%) covered by the respondents from the location of the water sources. The respondents suggested that, the solution to mitigating this problems include regular dredging, trimming of weed, boosting the tourist, prohibition of refuse dump into water and beautification.

The prohibition of refuse dump into water courses alone accounted for 43.3% of the respondents. Result revealed that males were more aware of the water bodies than females in the study area. More than half of the respondents were married with family size of 2-3 members.

Table 3: The use of surface water in the study area

Variables		Frequency	%
Reasons for obtaining water	Only source of water	20	6.2
	Do not obtain from public source	88	27.4
	Prefer it to other source	24	7.5
	Easy access	61	19.0
	Suitable for use	25	7.8
	Natural state	19	5.9
	No response	84	26.2
	Total	**321**	**100.0**
Rate of obtaining the water	Regularly	63	19.6
	Occasionally	67	20.9
	Rarely	90	28.0
	No response	101	31.5
	Total	**321**	**100.0**
Satisfaction Requirement	Yes	102	31.8
	No	129	40.2
	No response	90	28.0
	Total	**321**	**100.0**
Level of water obtained	1-50 litres	93	29.0
	50-100 litres	54	16.8
	100-200 litres	31	9.7
	200-500 litres	35	10.9
	Above 500 litres	3	.9
	No response	105	32.7
	Total	**321**	**100.0**
Scarcity of water bodies	Yes	204	63.6
	No	44	13.7
	No response	73	22.7
	Total	**321**	**100.0**
Period at which scarcity is common	During dry season	156	48.6
	Heavy downpour	25	7.8
	Much people	13	4.0
	Flooding	30	9.3
	Pollution	28	8.7
	No response	69	21.5
	Total	**321**	**100.0**
Other uses attached to the water bodies	Recreation	67	20.9
	Sports	32	10.0
	Religious Worship	39	12.1
	Agriculture	65	20.2
	Fishing	46	14.3
	Tourism	18	5.6
	No response	54	16.8
	Total	**321**	**100.0**

The young people between the age of 15 and 25 years were the highest user of the water bodies in the study area. There activities were not limited to fetching of water but swimming and washing of cloths. This age range is more educated, adventurous, curious about the occurrences in their environment and interested in discoveries. Rivers and stream are the major sources of water supply and they accounted for 70% of all the water sources. Easy access and lack of public water supply were the major reasons for obtaining the water.

Water from borehole and hand-dug wells is believed to be safer than water from rivers, streams and lakes. It was also discovered that, large percentage of the respondents have regular access to the water bodies, while some does not. Some of the respondents have difficulties accessing the water bodies during dry season and whenever there is heavy down pour which often pollutes it. Other difficulties encountered include long distance before acquiring the water, too much patronage by other users and frequent clashes among users.

Table 4: Perception of water quality and treatment

Variables		Frequency	%
Satisfaction with the quality of the water	Yes	71	22.1
	No	161	50.2
	No response	89	27.7
	Total	**321**	**100.0**
The various methods used for water treatment	Use of cloth	37	11.5
	Use of chemicals (Alum)	150	46.7
	Use of herbs	9	2.8
	Use of industrial	36	11.2
	No response	89	27.7
	Total	**321**	**100.0**

Table 5: Types of diseases encountered by the respondents, other problems and solutions

Variables	Diseases	Frequency	%t
Types of diseases	Diarrhea	25	7.8
	Cholera	35	10.9
	Malaria	58	18.1
	Bilharzias	20	6.2
	Dysentry	31	9.7
	No response	152	47.4
	Total	**321**	**100.0**
Other problems	Long distance	94	29.3
	Too much demand	47	14.6
	Impure state	36	11.2
	Activities carried out	82	25.5
	Frequent clashes	18	5.6
	No response	44	13.7
	Total	**321**	**100.0**
Suggested solutions to problems encountered	Regular dredging	91	28.3
	Trimming of weed	24	7.5
	Boosting the tourist	20	6.2
	Prohibition of refuse	139	43.3
	Beautification	13	4.0
	No response	34	10.6
	Total	**321**	**100.0**

The impure state of water quality for a long period of time, and the activities carried out by most users including religious worship and agriculture wastes such as herbicides and insecticides were found to be repulsive in the study area. Increasing disposal of wastes has caused a lot of environmental damage, and

ADEJUWON, JO; ADEKITAN, AA; OLADUNMOYE, SL

emphasizes the need to monitor, protect and manage water resources.

However, water quality should be preserved from the viewpoints of living environment for biota and the ecosystem. Impact of water pollution on these means direct and indirect adverse effects on human beings through the food chain and disturbances in the ecosystem (Umuhoza Mbateye *et al.*, 2010). Defra (2001) found water pollution to be the environmental issue over which respondents had most concern, and concluded that 54% were concerned about pollution in rivers, bathing waters and beaches. As indicated in the result, most of the surface water users had contacted one disease or the other, including diarrhea, cholera, malaria, dysentry and bilharzias**.** Pimentel *et al.* (2004) reported that water pollution facilitates the spread of serious human diseases and diminishes water quality. They also observed that water shortage severely reduce biodiversity in both aquatic and terrestrial ecosystem, and threaten human food supply. Research commissioned by Scottish Government in 2006 demonstrated the importance of the water environment to people's quality of life, with about half stating that the water environment was very important to them (Dalrymple, 2006).

Conclusion: This study has shown many similarities between attitudes towards the water environment and other environmental issues, and a number of key findings that relate specifically to respondents relationship with water as a unique resource. It is evident that significant improvement in low water quality in the study area might lead to more recreational use of the environment, with consequent benefits for human well-being and the local economy when properly managed.

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