

Influence of Socio-Economic Attributes of Water Vendors on Methods Adopted in Cleaning the Jerry Cans used for Water Delivery to Residents of Dutse, Jigawa State, Nigeria.

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Abstract

Various health challenges have been reportedly associated with consumption of unclean water. Water vending is a well pronounced means of providing water for the residents of Dutse metropolis. This study investigates the influence of socio-economic attributes of water vendors (*Mairuwas*) on methods adopted in cleaning the jerry cans used for water delivery to residents of Dutse, Jigawa State, Nigeria. Multi-stage sampling procedure was used to sample eighty one (81) water vendors from whom information on the socio-economic attributes, sources of water, methods used in cleaning kegs and frequency of cleaning were collected using well-structured questionnaires. Data collected were analysed using descriptive and inferential statistics. The results showed that about half (49.4%) of the respondents are within the age category of 25-32 years of age, most (66.7%) were married with a mean household size of 5 members. Majority were Hausa (82.7%), Muslim (96.3%) and non-members of an association (82.2%). Majority (86.4%) had one form of education or the other and a mean year of experience of 5 years in water vending. The result also indicates that a sizeable proportion (43.2%) source water from mixed sources. Water and detergent was adopted by a sizeable proportion (42%) as the methods for cleaning. The result on the categorisation of method used in cleaning jerry cans showed that most (66.7%) of the vendors adopt the preferred method for cleaning. Most (50.6%) of the vendors agree to washing the jerry cans weekly. Significant relationship ($P < 0.05$) existed between level of education, years of experience and methods adopted for jerry cans' cleaning. Even though the majority of the water vendors interviewed in this study reportedly clean their jerry cans always, there is a need to enlighten them on most appropriate methods of washing with a view to ensuring the safety of the water supplied to the residents.

Keywords: Water vendors, water vending, jerry cans and water quality

1. Introduction

Lack of availability of water is one of the major problems facing the world. Access to water is measured by the number of people who have reasonable means of getting an adequate amount of water that is safe for drinking, washing and essential household activities expressed as a percentage of the total population (Ishaku *et al.*, 2011). Gleick (2003) and Adewusi (2003) estimated that more than a billion people world-wide lack access to safe drinking water, while 2.4 billion people lack access to adequate sanitation services and the failure to satisfy basic water needs.

Similarly, a research by World Health Organisation (1997) reiterated that developing countries are hindered more from adequate supply of portable water. Their research further estimated that within the period of 2000 to 2006, the proportion of the population with access to an improved drinking water source rose from 74 percent to 84 percent with nearly 1 billion people still using water from unimproved sources such as shallow wells, rivers, streams, ponds and drainage ditches-with their impending health and safety risks. This scenario is not different from the one obtainable in Nigeria where one of the largest environmental challenges being faced is water scarcity. Ogunleye (2003) stated in his research that studies conducted by the Nigerian National Bureau of Statistics (NBS) and UNICEF showed that as at 1999, only 54% of households in Nigeria obtained drinking water from safe sources. Unfortunately, with the rapid process of urbanization, the percentage would have reduced, one and a half decades after the conduct of the studies.

Zaroff and Okun (1984) defined water vendors as those who sell by distributing water in containers, ranges from the delivery of water in containers brought by carts, bicycles, or jeepneys and in tanks or trucks. The authors further indicated that water may be obtained from private or municipal taps, stand posts, rivers or wells and sold either from a public vending station or door-to-door. Vendors may either sell directly to consumers or act as middlemen, selling water to carriers who in turn serve the consumers. Increasing Patronage of water vendors is now gaining grounds in Nigeria as the increasing gap in the demand and supply of water continues to acquire crisis proportions due to failure of government to provide adequate water supply to the people through piped systems (Onyenechere *et al.*, 2012).

Most patronisers of water vendors are unaware about the source of water that is sold to them nor the hygiene statue of the containers used for distribution as their concern is based on the availability of water for use. In

recognition of this fact, World Health Organisation (2006) reported that vended water has been associated with outbreaks of diarrhoea disease as some of the water was obtained directly from unprotected source such as unprotected wells and surface water including rivers/streams, ponds and canals and so on. In spite of the problems associated with water vending, a report by Cairncross and Kinnear (1991) however acknowledged that water vendors provide an invaluable service for communities in urban areas with no access to piped water and also create job opportunity for persons with low skills performance. Alfie (2014) was also of the agreement that water vending is one of the means of earning livelihood, as the required financial input and skills involved are low. The author further recommended that there is a need for a street vendor's bill which will provide a conducive environment for the street vending activities and their livelihoods.

It is against this backdrop that this study intends to look at the socio-economic characteristics of the water vendors (*Mairuwas*) in Dutse, Jigawa State, Nigeria. The main objective of the study was to look at the people who do engage in water vending, their background, their level of education, and the level of hygiene they practice during the course of delivering the water to their customers. However, the study have the following specific objectives:

- i. To assess the socio-economic attributes of water vendors in Dutse;
- ii. To investigate the source of water being fetched/sold by water hawkers;
- iii. To examine the methods adopted in washing the kegs (jerry cans) used for water delivery; and
- iv. To ascertain the frequency of washing adopted by the water hawkers.

Study Area

Jigawa State comprises of 27 Local Government Councils. The State Capital, Dutse acts as the commercial, administrative and residential hub of the State. With about 3.11% of the Nigerian population, Jigawa State ranked 8th among the most populous states in Nigeria. The population of the state, based on the 2006 Population Census, is 4,361,002 of which 50.4% are males and 49.6% females. 85% of the population of the State live in rural areas. Population density is estimated to be 178 people per square kilometres. This is above the average national population density of 139 people per square kilometres as at 2006. In terms of age distribution it is estimated that about 42.2% are below the age of 15 years, 49% are between 15 – 59 years while 8.8% are 60 years and above. Based on national estimates, life expectancy at birth in Jigawa State was 47.8 years - 47.2 years for males and 48.5 years for females as at 2008 (Sanusi *et al*, 2013).

The daily per capita public water supply is 30 litres with the proportion of total daily water requirement obtained from private water supply being between 40%-59%. The overall literacy rate in 2002 was 37% (22% women and 51% men), with the primary school enrolment rate of 29.6%. Jigawa State has a surface water volume of approximately 477 mcm (streams, rivers and ponds), ground water volume of 30,000- 40,000 m³ per km² yearly and water recharge is 3,676 mcm /year from rainfall (Sanusi *et al*, 2013).

These authors stated further that the state's economy is largely characterised by informal sector activities with agriculture as the major economic activity. Over 80% of households in the state derive their income from farming, including animal husbandry. With its agriculture based economy and a population of 4.4 million people, the state has a high potential for both production and consumption (Sanusi *et al*, 2013).

Dutse is the State Capital and is made up of the three traditional settlements of Garu, Limawa and Fagoji (Sanusi *et al*, 2013). Dutse is an ancient city transformed into modern residential, commercial and industrial layouts, and a growing and vibrant population of almost 250,000 (recorded in the 2006 census). It now contains five districts - Fagoji, Takur, Garu, and Limawa Districts, respectively. Each district has its own potential investment opportunities and characteristics (Sanusi *et al*, 2013).

Study Design

A multi-stage sampling procedure was used for this study. The first stage involved the purposive selection of five localities (Zai, Yelwawa, Mobile Base, Hakimi Street and Maranjuwa Quarters) within the metropolis. The purposive selection was based on the concentration of water vendors in these areas. The second stage involved generating a list of water vendors in the selected areas from which a representative proportion of water vendors were selected using simple random sampling leading to a total of eighty one (81) respondents that were interviewed. Structured questionnaire was used to elicit information on socio-economic characteristics, sources of water fetched, methods adopted in cleaning kegs and frequency of cleaning. A list of all the methods adopted for cleaning jerry cans were listed and scores awarded accordingly, respondents were asked to select the method employed in cleaning their jerry cans. An index was constructed to categorize these methods into best practices and poor practices. Mean scores and above mean scores were categorized into best practices while below mean scores were categorized into poor practices. Frequency of washing was measured as not at all, rarely and always. Data collected were analysed using descriptive statistics (frequency, percentages and charts) and inferential statistics (Chi-square at 0.05 level of significant).

Results and Discussion

Table 1. Socioeconomic Characteristics

Variables	Percentage	Frequency
Age		
17-24	22.2	18
25-32	49.4	40
33-40	24.7	20
≥ 41	3.7	3
Marital Status		
Single	33.3	27
Married	66.7	54
Ethnicity		
Ibo	1.2	1
Hausa	82.7	67
Yoruba	0.0	0
Others	16.0	13
Religion		
Islam	96.3	78
Christianity	0.0	0
Traditional	3.7	3
Membership		
Yes	17.3	14
No	80.2	65
No response	2.5	2
Washing of Jerry Cans		
Yes	91.4	74
No	6.2	5
No response	2.4	2

Table 1 above shows the age bracket, marital status, ethnicity, religion, and membership status of respondents as well as their frequencies and percentages. 49.4% of the respondents are between the ages of 25-32 the result conforms with the finding of Onyenechere *et al* (2012) which states that majority of water vendors in Nigeria are youths striving to earn a living with water vending. 24.7% age range from 33-40 and 22.2% is 17-24, while the lowest percentage (3.7) is reflected above age 41.

Table 1 also indicates that a higher number of married men engage in water vending as major occupation. The study shows that 66.7% of respondents are married while 33.3% are single. Most of the water vendors are Hausa by tribe (82.7%) and Muslims also ((96.3%). However, there are a few vendors who are of other ethnic groups (16.0%) and one Igbo. Also, some of them are traditionalists (3.7%) but no Christians amongst them. Most of them are not members of any water vending association as shown in the table above whereby 80.2% of the respondents responded negatively as regards being a member of any association.

Finally, the table equally shows that most water vendors do wash the jerry cans used for water vending. 91.4% of them wash the jerry cans, 6.2% do not perform any form of hygiene technique neither do they wash their jerry cans used for water distribution and 2.4% did not respond to the question.

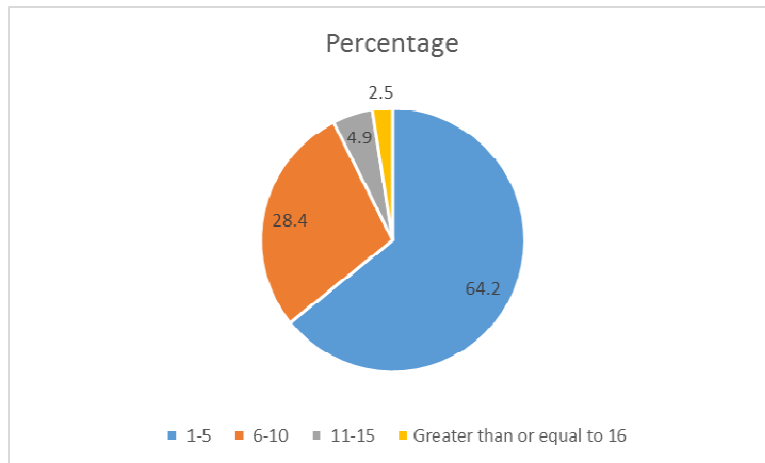


Figure 1. Household size of the Water vendors

Results from Figure 1 indicate the various household sizes of the respondents. The household survey shows that 64.2% of the respondents have household sizes of 1-5, 28.4% have sizes of 6-10, 4.9% have a total household size of 11-15, and 2.5% have 16 and above total of their household size.

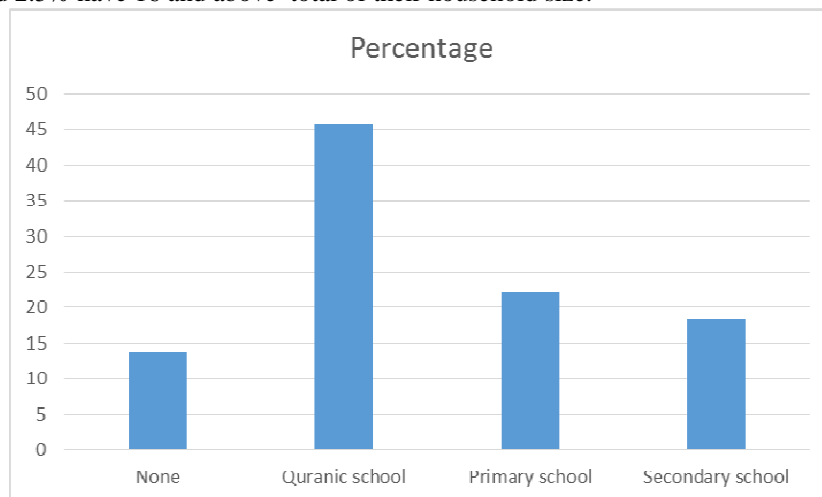


Figure 2. Level of Educational Attainment

The educational attainment of the respondents (Figure 2) also varies but most of them have one form of education or another. Majority of them have Quranic education (45.7%), some have had western education up to primary school (22.2%), and secondary school (18.5%) respectively. Furthermore, there are respondents who do not have any form of education (13.6%). This survey thus concurs with finding of Karthikeyan and Mangaleswaran (2013) which observed that most water vendors own low skills and lack tertiary education.

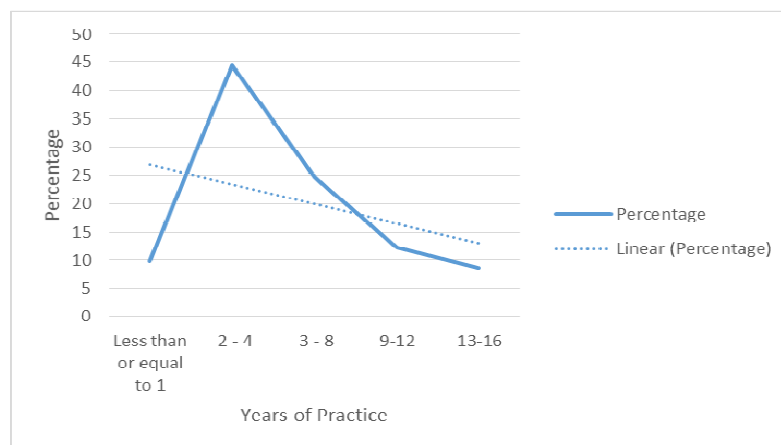


Figure 3. Years of experience of the respondents

The results in Figure 3 indicate that the years of experience associated with water vending amongst the

respondents vary. 44.4% of the water vendors have attained on the job experience for a period of 2-4 years, 24.7% have been on the job for 3-8 years, 12.3% have been doing it for 9-12 years, 9.9% have been engaging in water vending for less than or exactly 1 year, the remaining 8.6% have been on the job for 13-16 years and the mean years of experience for water vending amongst the water vendors is 5 years.

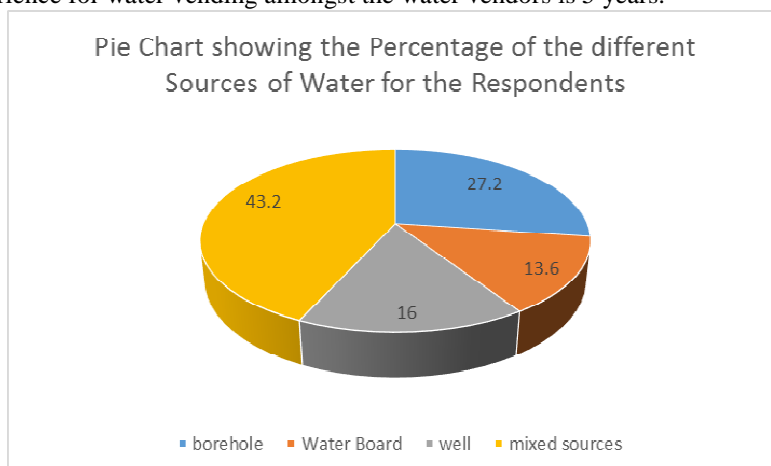


Figure 4. Sources of water sold to residents.

Figure 4 shows the different sources of water obtained by the vendors for distribution around the metropolis. Most water vendors get their water from boreholes around the town (27.2%) but a high number of them (43.2 %) source their water from other sources like streams and ponds. More so, 16% of them get their water from wells, 13.6% of the respondents get their water from the supply of Jigawa State Water Board.

Table 2a. Methods Adopted in Cleaning Jerry Cans

S/N	Methods Adopted	Frequency	Percentage
1	Otherwise	16	19.7
2	Water only	11	13.6
3	Water and detergent	34	42.0
4	Water, sand and detergent	20	24.7

Table 2b. Categorisation of Methods Adopted for washing

Categories	Scores	Frequency	Percentage
Less preferred	0-1	27	33.3
Preferred	2-4	54	66.7

Table 2a and 2b show the methods employed by vendors in washing their jerry cans. A sizeable proportion (42.0%) employs the use of water and detergent, 24.7% agree to using water, sand and detergent, water alone (13.6%) while 19.7% do otherwise. The results on the categorisation of the methods show most (66.7%) of the vendors employ the best practised method while 33.3% employ poorly practised method in cleaning their jerry cans. The results also suggest that more awareness still needs to be created with a view to ensuring that water vendors employ best cleaning practices since water plays a significant role in human health.

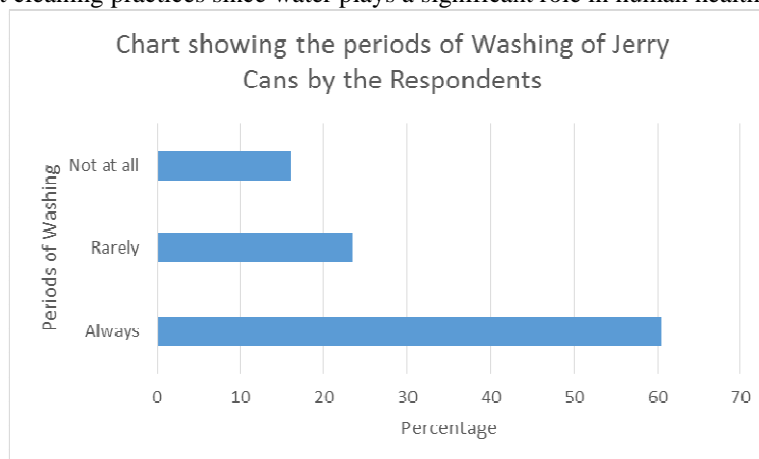


Figure 5. Frequency of washing jerry cans

Analysis on the frequency of washing of jerry cans shown in Figure 5 indicates that 60.5% of the water vendors wash always, 23.5% wash rarely while 16% do not wash their jerry cans at all. This implies that most of the respondents (60.5%) wash their jerry cans always.

Table 3. Results of Pearson Chi-Square Test

Variables	Degree of Freedom (df)	χ^2 – Value	P-Value	Significance
Age	3	3.175	0.365	Not significant
Marital Status	1	0.250	0.617	Not significant
Household Size	3	2.310	0.511	Not significant
Level of Educational Attainment	3	7.840	0.049	Significant
Ethnicity	2	4.071	0.131	Not significant
Religion	1	0.000	1.000	Not significant
Years of Experience	4	9.740	0.045	Significant
Membership of Association	2	1.014	0.602	Not significant

Table 3 shows the test of relationship between socioeconomic attributes and methods adopted for cleaning the water vendors' jerry cans. There was significant relationship ($P < 0.05$) between levels of education, years of experience ($P < 0.05$) and method adopted for cleaning jerry cans. This implies that as both variables improve, the greater the tendency to adopt the best practices in the cleaning of jerry cans. Thus, only education and years of experience are factors that influence the methods employed in the cleaning of jerry cans. The assertion on education is in total agreement with the submission of Fadairo *et al* (2015) indicating that the basic objective of any form of education is to impact knowledge which would influence a change in attitude, skills, or knowledge.

Conclusion and Recommendations

The study concludes that respondents are in their active ages, with families and have gathered some reasonable years of experience in water vending with less affiliation with government or artisans' created associations. The results generated from this study clearly indicate that water vending is sustainable and perhaps a viable means for income generation.

Again, the results obtained from this study strongly suggest that more awareness campaigns are still needed to ensure that water vendors maintain proper hygiene as humans consume and utilize the vended water directly. Even though the majority of the water vendors interviewed in the course of this study reportedly clean their jerry cans always, there is a need to enlighten them on most appropriate methods of washing with a view to ensuring the safety of the water supplied to the residents. However, there is a need to undertake a follow up study with a view to analysing the quality of the vended water so as to ascertain the absence of water pathogens and other attributes that may lead to water related health problems. Finally, in line one of the cardinal programmes of the sustainable development goal projects of the World Bank, government must be proactive in the provision of potable water for her citizenry.

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