

Assessment of Water Supply and Toilet Facilities in Selected Primary Schools of Kolo Creek Area, South-South Nigeria

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Abstract: The importance of adequate water supply and toilet facilities to good hygiene practices that leads to healthy individuals cannot be overemphasized especially for primary school pupils in rural communities. This study therefore assessed water supply and toilet facilities in selected primary schools in Kolo creek area of Nigeria. The cross sectional research method was used for this study. A total of 25 public primary schools were identified in the study area of which 16 schools representing 60% of the identified schools were sampled. 184 copies of questionnaires were administered to teachers of the sampled schools while focal group discussions were also held with the school pupils and some teachers of the sampled schools. The data collected were analysed using tables while the stated hypothesis for the study was tested using the chi-square statistical tool. The result showed that 75.5% of teachers in the study area were educated to the bachelor's degree level and 85.16% have 10 years' experience and over. The two major sources of water in the study area are river (30.9%) and borehole (30%). However, 75% of the respondents stated that daily water requirement in the study area is insufficient while 96.7% stated that there is a prevalence of water supply challenge. Pit latrine is the common type of toilet facility used in the study area. While 56.6% of the respondents stated that toilet facilities are not available, 75% stated that the functionality of the toilet facility is not adequate. The Chi-square calculated value of 13.96 being greater than the critical value of 3.481 rejected the null hypothesis therefore confirming that there is a relationship between toilet facility availability and functionality of the toilet facility. The study concluded that there is a prevalence of water supply and requirement challenge in the study area. Most of the available toilet facilities in the study area are not functional and therefore not adequate. These challenges pose great health risk to the pupils thereby impacting academic and extracurricular activities of the schools in the study area. It is therefore recommended that local authorities ensure provision, maintenance and regular inspection of water supply and toilet facilities in schools especially in rural communities to improve hygiene and ultimately academic performance. Regular hygiene education by stakeholders will create awareness and help break the cycle of diseases in the study area.

Keywords: Water supply; Toilet facilities; Primary schools; Kolo creek; Availability; Risk

I. INTRODUCTION

Environmental sanitation, safe and adequate water supply with good hygiene practices promotes the health of people and communities by breaking the cycle of diseases.

However, unsafe and inadequate water supply, poor sanitation and hygiene practices have become a burden to developing countries (WHO 2004) including Nigeria.

Breaking the cycle of diseases require a holistic approach by all stakeholders through sanitation interventions measures like regular environmental cleanliness, cleanliness of toilets, sewage and drainage systems, good hygiene behaviours and effective education especially in schools.

School children deserve the right to safe and adequate water supply facilities including functional toilet facilities to ensure healthy living and full participation in academic and extra-curricular activities. Diarrhoea caused by polluted water, poor hygiene and sanitation kills an estimated 11 children in every 1000 for children less than five years each year in Nigeria. (WaterAid, 2016)

Continuous awareness is required to bridge the knowledge gap and ensure authorities are taking action to prevent the death of children. Several studies have indeed been conducted on water and sanitation conditions in Nigerian schools (Aremu, A. S 2012), (B. Adeleye et al 2014), (Agbo H Abigail et al 2012), (Best Ordinioha et al 2008) among others, but relatively very few have conducted studies on the Kolo Creek area consisting of communities from both Rivers and Bayelsa States of Nigeria.

This study therefore focuses on the assessment of water supply and toilet facilities in selected primary schools in Kolo Creek area of South-South, Nigeria. It aims to ascertain the water related issues and the influence of available toilet facility on the functionality of the toilet facility in the study area.

Study Area

Kolo Creek is located in the Niger delta region of South-South, Nigeria. It flows from Okarki in Rivers State to Otuoke in Bayelsa State, Nigeria. It is a non-tidal fresh water creek that serves several communities some of which are Imiringi, Otuasega, Emeyal 1 and Emeyal 2 among others. The Creek has greatly been impacted by several years of anthropogenic activities (Agamini O et al 2018) since the commencement of oil and gas exploration in the surrounding area.

The Kolo Creek area enjoys similar climatic conditions as other Niger delta regions which are characterised by high rainfall. The area belongs to the coastal sand ridges zone of the Niger delta and is drained by the Orashi River. It is a low

lying area with its attendant poor drainage. The study area is located around 4°.47'0"N – 6°.25'0"E within the lower Niger Delta. The figure 1 below shows the Kolo Creek with communities.

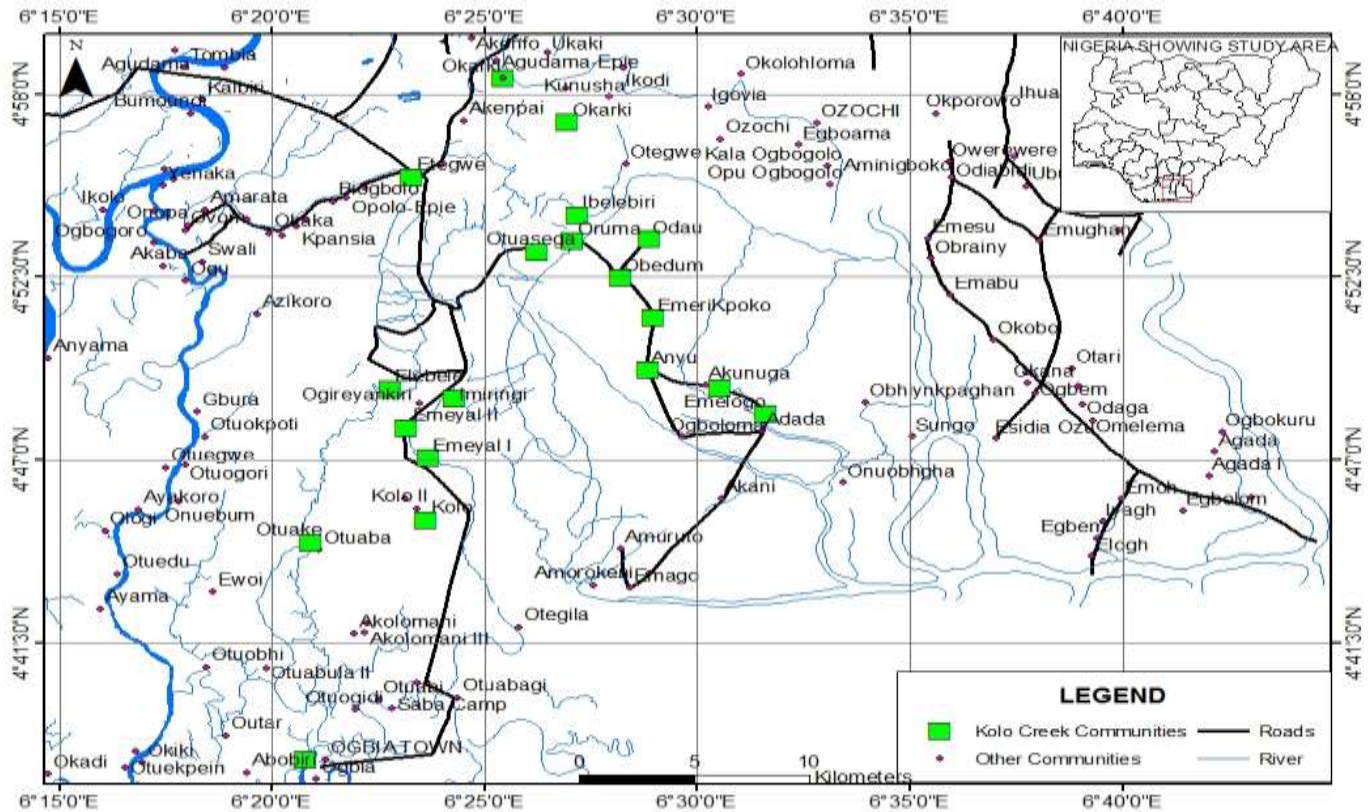


Figure 1: Map of Kolo Creek showing Communities

Source: Author's Field Work 2014

II. MATERIALS AND METHODS

The cross sectional research method was used for this study which focused mainly on primary data with questionnaire as the instrument of data collection. A total of 184 copies of questionnaires were distributed and administered to teachers in the identified schools. Focal group discussions and interviews were also held with the pupils and teachers of the various schools. A total of 25 public owned primary schools were identified in the study area of which 16 schools were sampled for the study accounting for over 60% of the total number of schools in the study area.

The table below shows the schools selected and the number of teachers interviewed for the study.

Table 1: Sampled Primary Schools in Kolo Creek Area

| S/N | Schools | No. of Teachers |
|-----|---------------------------|-----------------|
| 1. | Community Primary, Okarki | 14 |
| 2. | State School, Odau | 6 |
| 3. | State schools, Emerikpoko | 5 |

| | | |
|-----|--|-----|
| 4. | State School, Obedum | 7 |
| 5. | State School, Anyu | 9 |
| 6. | State School 11, Oruma | 13 |
| 7. | State School, Otuegwe 1 | 8 |
| 8. | State School, Otuegwe 11 | 9 |
| 9. | State school 1, Emeyal | 16 |
| 10. | State school 11, Emeyal | 12 |
| 11. | Christ the King State school, Imiringi | 15 |
| 12. | U.P.E, Imiringi | 21 |
| 13. | State school 1, Oruma | 16 |
| 14. | State school 1, Otusega | 10 |
| 15. | State school 11, Otusega | 12 |
| 16. | State School, Ibelebiri | 11 |
| | Total | 184 |

Source: Author's Field Work 2014

The focal group discussion with the pupils from the different schools aimed to ascertain their access to potable water supply and toilet facilities as well as their behaviour towards the sanitary condition of their schools.

A visual study of the toilet facilities in each of the schools were conducted and graded to ascertain the adequacy and quality of the toilet facilities in relation to its availability,

using basic housing quality criteria. Toilets to pupil ratio in each school were determined. The data collected for this study was presented using tables, while the stated hypothesis for the study was tested using the Chi-Square statistical tool.

III. RESULTS

The demographic and socio-economic characteristics of respondents are as described in the table below.

Table 2: Socio–Economic Characteristics of Respondents

| Sex | | Age | | Marital Status | | No of years of teaching | | Educational Qualification | |
|--------|-------------|-------|------------|----------------|-----------|-------------------------|-------------|---------------------------|-----------|
| Male | 50 (27.2%) | 30-39 | 50 (27.2%) | Married | 160 (87%) | 5-10 | 42(22.8%) | NCE | 45(24.5%) |
| Female | 134 (72.8%) | 40-49 | 52(28.3%) | Single | 24(13%) | 11-20 | 142(77.16%) | B.ed | 114(62%) |
| | | 50-59 | 82(44.5%) | Divorced | Nil (0%) | 21-30 | Nil (0%) | B.sc | 25(13.5%) |
| | | 60 + | Nil (0%) | Widowed | Nil (0%) | 31+ | 8(0.04%) | M.sc | Nil (0%) |
| | | | | | | | | Ph.D | Nil (0%) |
| Total | 184 (100%) | | 184(100%) | | 184(100%) | | 184(100%) | | 184(100%) |

Source: Author's Field Work 2014

Table 2 showed 50 of 184 respondents were male, representing (27.2%) of the total respondents while 134 of them were female, representing (72.8%). On the age bracket, 50 respondents (27.2%) were within the ages of 30-39yrs, another 52 respondents (28.3%) in the age bracket of 40-49yrs while 82 respondents representing (44.5%) were in the age brackets of 50-59years. The marital status showed that none of the respondents were either divorced or widowed. A total of 160 respondents representing (87%) of the population were married while 24 respondents representing (13%) were single. The years of teaching among the respondents showed that 42 respondents representing (22.8%) had been teaching between 5-10years, 142 of the respondents representing (77.16%) had been teaching between 11-20years and finally 8 of the respondents representing (0.04%) of the population had been teaching for over 31 years.

The table also showed that most of the respondents (114) representing 62% of the sampled population possessed B.ed, 40 respondents representing (24.5%) possessed NCE while 25 respondents representing (13.5%) of the total sampled population possessed B.sc degrees.

Table 3: Major Sources of Water Supply

| Water Sources | Frequency | % |
|---------------|-----------|------|
| Bore hole | 55 | 30 |
| Hand dug well | 10 | 5.4 |
| Rain water | 38 | 20.7 |
| Stream / Pond | 24 | 13 |
| River | 57 | 30.9 |
| Total | 184 | 100 |

Source: Author's Field Work 2014

From table 3, the responses indicated that Bore hole, Hand dug well, Rain water, Stream/Pond and River sources of water supply had 30%, 5.4%, 20.7%, 13.0% and 30.9% respectively. It therefore showed that most schools depended on River and Bore hole water sources as their major water supply in the study area.

Table 4: Sufficiency of Daily Water Requirements

| Response | Frequency | Percentage % |
|----------|-----------|--------------|
| Yes | 46 | 25 |
| No | 138 | 75 |
| Total | 184 | 100 |

Source: Author's Field Work 2014

Table 4 showed that 75% of the respondents indicated that most schools in the study area have insufficient water supply to meet their daily requirements while 25% responded to the contrary.

Table 5: Prevalence of Water Supply Challenge

| Response | Frequency | Percentage% |
|----------|-----------|-------------|
| Yes | 178 | 96.7 |
| No | 6 | 3.3 |
| Total | 184 | 100 |

Source: Author's Field Work 2014

Table 5 indicated that 96.7% of the respondents agreed that there was a prevalence of water supply challenge within the study area while only 3.3% disagreed. This therefore agreed with table 4 that most schools do not have sufficient water supply to meet daily requirement.

Table 6: Impact of Water Related Issues in the Study Area

| Water related issues | Response | Frequency | Percentage% |
|---|----------|-----------|-------------|
| Slowing down of school activities | Yes | 112 | 60.9 |
| | No | 72 | 39.1 |
| Total | | 184 | 100 |
| Too much time is wasted in search of water | Yes | 98 | 53.3 |
| | No | 86 | 46.7 |
| Total | | 184 | 100 |
| Long queues in fetching water, resulting in quarrels | Yes | 79 | 42.9 |
| | No | 105 | 57.1 |
| Total | | 184 | 100 |
| Students usually are late for commencement of classes in school | Yes | 70 | 38 |
| | No | 114 | 62 |
| Total | | 184 | 100 |
| Risk of drinking polluted water from open wells and surface water due to water shortage | Yes | 148 | 80.4 |
| | No | 36 | 19.6 |
| Total | | 184 | 100 |

Source: Author’s Field Work 2014

Table 6 described the responses related to the water issues in the study area. 60.9% of the respondents agreed water related issues slowed down school activities, while 39.1% contradicted the opinion. While 53.3% agreed too much time is wasted in search of water, 46.7% thought otherwise. 57.1% did not agree that long queues in fetching water resulted in quarrels, 42.9% had a contrary opinion. 62% of respondents said students were usually not late for classes due to water related issues, while 38% said they were usually late for classes. 80.4% of the respondents agreed that there was the risk of drinking polluted water from open wells and surface water while 19.6% disagreed. Therefore, it can be deduced that water related issues impact the schools in the study area.

Table 7: Availability of Pupil Toilet Facility

| Response | Frequency | Percentage % |
|----------|-----------|--------------|
| Yes | 80 | 43.5 |
| No | 104 | 56.5 |
| Total | 184 | 100 |

Source: Author’s Field Work 2014

From Table 7, 43.5% of respondents said there were available student toilet facilities while 56.5% responded in the contrary.

Table 8: Type of Toilet Facility Available

| Type of toilet | Frequency | Percentage % |
|----------------|-----------|--------------|
| Water closet | 38 | 20.7 |
| Pit latrine | 54 | 29.3 |
| Bucket | 28 | 15.2 |
| No toilet | 64 | 34.8 |
| Total | 184 | 100 |

Source: Author’s Field Work 2014

Table 8 showed 20.7% of the schools in the study area used Water closet toilet facility, 29.3% used Pit latrine facility, 15.2% used Bucket as toilet facility while 34.8% of the schools had no toilet facility. This therefore implied that pit latrine was the predominant type of toilet facility being used in the study area. It also showed that most schools (34.8%) did not have toilet facility therefore leaving the students with no option but to defecate in nearby bushes and water bodies, exposing them to the risk of contracting diseases and sustaining personal injury.

Table 9: Functionality of Toilet Facility

| Functionality | Frequency | Percentage% |
|-----------------|-----------|-------------|
| Very adequate | 0 | 0 |
| Adequate | 7 | 3.8 |
| Fairly adequate | 39 | 21.2 |
| Not adequate | 138 | 75 |
| Total | 184 | 100 |

Source: Author’s Field Work 2014

Table 9 indicated that Adequate, Fairly adequate and Not adequate had values of 3.8%, 21.2% and 75% respectively. This therefore showed that most schools in the study area did not have adequate toilet facility.

Table 10: Toilet Facility to Pupil Ratio

| Ratio of toilet to pupil | Frequency | Percentage% |
|--------------------------|-----------|-------------|
| 1:5 | 0 | 0 |
| 1:10 | 4 | 2.2 |
| 1:15 | 49 | 26.6 |
| 1:20 and above | 131 | 71.2 |
| Total | 184 | 100 |

Source: Author’s Field Work 2014

Table 10 showed that 2.2%, 26.6%, 71.2% were attributed to ratio of 1:10, 1:15 and 1:20 and above respectively. This implied that the usage of available toilets is over stretched due to the high ratio of toilet to students, exposing the students to possible health risks.

Table 11: Presence of Hand Washing Facility

| Response | Frequency | Percentage % |
|----------|-----------|--------------|
| Yes | 155 | 84.2 |
| No | 29 | 15.8 |
| Total | 184 | 100 |

Source: Author’s Field Work 2014

Table 11 showed that 84.2% of the respondents agreed to having hand washing facilities in the schools within the study area while 15.8% responded to the contrary.

Hypothesis Testing

The hypothesis of the study states as follows;

H_0 : There is no statistically significant relationship between toilet facility availability and the functionality of the toilet facility.

H_1 : There is a statistically significant relationship between toilet facility availability and the functionality of the toilet facility.

Table 12: Chi-Square analysis for Influence of Toilet Facility Availability on Functionality

| Response | Frequency | Frequency | Total |
|----------------------|-----------|-----------|-------|
| | Yes | No | |
| Toilet availability | 80 | 104 | 184 |
| Toilet functionality | 46 | 138 | 184 |
| Total | 126 | 242 | 368 |

Source: Author's Field Work 2014

Table 13: Chi-Square Contingency Table

| Observed | Expected | O-E | (O-E) ² | (O-E) ² |
|-----------------|--------------|----------|--------------------|--------------------|
| | | | | E |
| 80 | 63 | 17 | 289 | 4.59 |
| 46 | 63 | -17 | 289 | 4.59 |
| 104 | 121 | -17 | 289 | 2.39 |
| 138 | 121 | 17 | 289 | 2.39 |
| | | | | $X^2 = 13.96$ |
| $df=(R-1)(C-1)$ | $(2-1)(2-1)$ | $df = 1$ | | |

Source: Author's Field Work 2014

The X^2 calculated value is 13.96, while the critical value at 1 degree of freedom and 95% significant level is 3.841. Therefore, since the calculated chi-square statistic value of 13.96 is greater than the critical value of 3.841, the null hypothesis which states that there is no statistically significant influence of toilet availability on functionality of toilet facility is rejected and the alternate hypothesis which states that there is a statistically significant influence of toilet availability on functionality of toilet facility is accepted.

IV. DISCUSSION

This study revealed from table 2 that there were more female teachers (72.8%) than their male counterparts (27.2%). It also showed that most of the teachers in the study area (75.5%) were educated to the bachelor's degree level and 85.16% of the teachers had teaching experiences of over ten (10) years. These attributes of teachers in the study area serve to contribute positively to the academic achievement of the pupils. (Kola A.J et al 2015)

Table 3 indicated that major sources of water supply in the area are river, borehole and rainwater in that order, however sufficiency and supply remained a challenge as table 4 and 5

stated that 75% of the respondents agreed that the daily water requirement in the schools were insufficient and also 96.7% of the respondents supported that there was a prevalence of water supply challenge in the various schools. These revelations were in agreement with other studies that describes the impact of water shortages in Nigerian communities (Adeleye B. et al 2014, Jasper C. et al 2012, Aremu A. S 2012, Agbo H. A et al 2012). The greater challenge had to do with the impact on vulnerable primary school pupils. The prevailing conditions as observed in the study area definitely affects the learning and extra-curricular activities of the pupils. This was showed in table 6 where 60.9% of respondents supported the fact that water related issues slowed down school activities. 53.3% also affirmed that much time was wasted in search of water. Table 11 showed 84.2% of respondents said hand washing facilities were available. However, water supply availability and requirement challenge as stated in tables 4 and 5 made it difficult for effective hand washing to take place. When all these challenges occurred, pupils were forced to behave in an unhygienic manner thereby endangering their health as was stated by 80.4% of the respondents that the schools are faced with the risk of drinking polluted water.

When water supply challenges as indicated in tables 4, 5 and 6 are prevalent in schools, especially at the primary level, it will be far from the truth to suggest that sanitary conditions will be any better in those schools. Table 8 indicated that 34.5% of respondents affirmed that no toilets exist within the school premises in the study area. The figure was higher than the percentage of schools with pit latrine (29.3%), water closet (20.7%) and bucket (15.2%) toilet systems. Even though the table 10 showed that 71.6% of respondents agreed that the ratio of toilet to pupil is 1:20 and above, table 7 indicated that 56.5% of respondents said that toilet facilities were not available in the various schools while 43.5% disagreed. However, 75% of the respondents had said that the functionality of the toilet facilities were not adequate, throwing back the hypothesis as to whether there is a relationship between available toilet facilities and functionality of the toilet system or not, being one of the questions this study set out to answer.

Toilet facilities that are available need to be functional and vice versa in order to be used effectively. Provision of adequate water supply for cleaning or washing during and after toilet facility usage is very important to maintaining a hygienic environment, especially in primary schools with vulnerable children. A functional toilet facility should be made accessible to the user. A toilet facility that is built some distance away from the class room and possibly covered by over grown weeds poses a risk to the user and cannot be said to be available even if the facilities are functional. The pupils may decide to seek self-help by defecating in a nearby open and "more comfortable" place usually around the school premises, posing additional health risks to all.

Toilet usage overcrowding or overstretching of the toilet facility not only poses great health risk to its users, it may

possibly lead to the toilet facility damage, thereby rendering an available toilet facility non-functional. This scenario was confirmed by the hypothesis since the calculated chi-square statistic value of 13.96 is greater than the critical value of 3.841 therefore, the null hypothesis was rejected and the alternate accepted, which stated that there is a statistically significant relationship between toilet facility availability and the functionality of the toilet facility.

Therefore, an available toilet facility that is functional or a functional toilet facility that is available should have the ability to serve its purpose with no health risk to its user, together with an acceptable level of comfort during usage.

V. CONCLUSION AND RECOMMENDATIONS

The study revealed that even though the teachers of the primary schools within the study area were well educated and experienced which served to contribute positively to the academic performance of the pupils, the schools were faced with water supply challenges that had impacted the academic and extra-curricular activities of the school pupils in the study area. Most of the available toilet facilities in the study area were not functional and therefore not adequate, posing great health risk to the pupils and presented situations for unhygienic behaviors among the primary school pupils within the study area. The hypothesis also confirmed that there is a statistically significant relationship between toilet facility availability and the functionality of the toilet facility.

Arising from the above, the study made the following recommendations;

1. Local authorities should ensure adequate water facility provision and maintenance in rural communities especially within educational institutions.
2. Toilet facility availability and functionality should be vigorously pursued by school authorities and management boards, noting the implication of this to the health of all especially the pupils.
3. Water, sanitation and hygiene (WASH) stakeholders should be encouraged and supported to conduct regular hygiene education for pupils and teachers in all educational institutions especially those in the

rural areas to increase their awareness and to help break the cycle of diseases.

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