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Evaluation of the Water, Sanitation and Hygiene (Wash) Programme Implementation (Availability/Accessibility of Safe Drinking Water) in Secondary Schools in Cross Rive State, Nigeria

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Keywords

Wash, Availability, Accessibili Safe Drinking Water

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Abstract

This study evaluated the Water, Sanitation and Hygie (WASH) programme implementati (availability/accessibility of safe drinking water) secondary schools in Cross River State, Nigeria. Tv research questions guided the work. Evaluation resear design was adopted with population comprised of all t 4,430 teachers and 16,662 SSS2 students across all 2 public secondary schools in Cross River State for t 2021/2022 academic session. The study's sample was 6 respondents (558 students and 140 teachers) drawn usi the multi-stage sampling procedure. The instrument us for data collection was the Checklist Availability/Accessibility of Safe Drinking Wat (CAASDW). The reliability coefficient was .90 usi Cronbach Alpha reliability method. The collected da were analysed using mean scores. The findings of t study showed that safe drinking water in seconda schools is available and accessible on a low extent. Bas on the findings and conclusions, it was recommend among others that Government and school administrato should provide boreholes, safe sources of drinking wat in secondary schools.

Introduction and Background

The Water, Sanitation and Hygiene (WASH) programme is a subcomponent of the child survival programme component of the United Nations Children's Fund (UNICEF) created in the early 1990s after the International Drinking Water Supply and Sanitation Decade (1981-1990). It was created to serve as a country-level program with a focus on reducing the risk for diseases by creating environments that support good personal hygiene and sanitation. The creation was primarily because access to water, sanitation and hygiene services is fundamental human need as well as human right, as it is vital for the dignity and health of all people. Access to water is strongly linked to effective sanitation and hygiene practices which in turn are strongly associated to good health, which is a strategic human development indicator (Folayan, Obiyan & Olaleye, 2020). This was a reason for the global actions to improve access to safe water, sanitation and hygiene.

The aim of WASH was to empower countries to enhance their access to and use of safe water and sanitation service, and to improve sustainable hygiene practices (Akwataghibe, Wegelin, Postma, Fajemisin, Banda, Khan, Jurji & Toonen, 2018). Its overall initial objective was to contribute to the realization of people's (with emphasis on children's) rights to survival and development through promotion of the sector. It also provided support to national programs that sought to increase equitable and sustainable access to and use of safe water, and basic sanitation services, to promote improved personal hygiene (United Nations, 2015). The importance of the sector was evidential in its inclusion in the then Millennium Development Goals (MDGs) as MDG 7 with its accompanying target 10.

Due to many countries' inability to attain the MDGs, Sustainable Development Goals (SDGs) were designed to drive the global purposes further. SDG 6 and its accompanying targets were designed to spur action within the water, sanitation and hygiene sector. Specifically, targets 6.1 and 6.2 were designed to that effect. Target 6.1 stated that; "by 2030, achieve universal and equitable access to safe and affordable drinking water for all" (UNICEF, 2008. Also, target 6.2 stated that "by 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations" (UNICEF, 2008, p 14). In addition to the aforementioned targets of SDG 6, the indicator for target 4a was also concerned in part with water, sanitation and hygiene. It states that the global indicator selected by UN Member States for monitoring SDG target 4a is "Proportion of schools with access to: basic drinking water; single-sex basic sanitation facilities; and basic hand washing facilities (as per the WASH indicator definitions)" (Boeren, 2019, p 7).

From the foregoing, achieving equitable and sustainable WASH objectives is a long-standing global goal, which has been spurred on by SDG 6 in recent times. Even before the global calls for development goals (the MDGs and SDGs), UNICEF had worked with countries and their cooperating partners to ensure increasing access to and use of improved water sources, sanitation

facilities and hygiene practice. In recent times, UNICEF's emphasis has been on those countries that did not attain the MDGs, which includes Nigeria (Boeren, 2019).

In 2010, an initiative tagged the Nigeria's 2014-2017 Country WASH Programme was designed to ensure increased access to, and use of water sources, sanitation facilities and hygiene practices, particularly among vulnerable communities (FGN, 2020). The four components of the 2014-2017 WASH Programme were as follows: Sanitation, Hygiene and Water in Nigeria Project II (SHAWN II); Water Supply Sanitation Sector Reform Programme II (WSSSRP II) (which was a follow-up on WSSSRP I, working in six focal states: Anambra, Cross River, Jigawa, Kano, Osun and Yobe.); Water Supply Sanitation Sector Reform Programme III (WSSSRP III), and; Niger Delta Support Programme (NDSP). With the European Union (EU) as a cooperating partner, the SHAWN II, WSSSRP II/III, and NDSP were designed to be implemented in the following states - Adamawa, Akwa Ibom, Anambra, Bayelsa, Cross River, Delta, Edo, Ekiti, Jigawa, Kano, Osun, Plateau and Rivers. The operating context for the FGN/UNICEF Nigeria WASH Programme (2014-2017) included the development of the 2016-2030 Partnership for Expanded Water Supply, Sanitation & Hygiene (PEWASH) Strategy and the National Roadmap for Eliminating Open Defecation (FGN, 2016; 2020).

WSSSRP II was delivered between 2012 and 2018 before being extended to 2019. It was designed to follow on from the previous WSSSRP I. The activities and strategies included within the programmes for schools had water point rehabilitation and construction as the primary objective (FGN, 2020). The key projects that formed the UNICEF-Nigeria's WASH Programme with the Government of Nigeria (WSSSRPII, WSSSRPIII, SHAWN II and NDSP) focused on: delivering and supporting safe access to WASH services across schools in the aforementioned states; supporting community engagement in WASH for sustainability, and; developing strong and effective systems for delivering and supporting a WASH sector-enabling environment (FGN, 2020). A succeeding WASH Programme for 2018–2022 was to support the government in implementing the PEWASH, and to provide access to basic water supply and sanitation to all rural inhabitants by 2030 (FGN, 2016). The 2018-2022 Programme was specifically designed to among other objectives, to increase the population's proportion using basic drinking water from 69% (baseline) to 76% (target) by 2022.

The focus of the WASH program started with households only, which constituted negligence to schools, before further assessment led to the extension of consideration of schools. As noted by Ohwo (2019), the WHO/UNICEF WASH Joint Monitoring Programme (JMP) was more concerned with households' access to WASH, thus less concerned with institutional (schools') access. With increasing emphasis on education as a basic right for children ever since the 21st century, the risk of acquiring infectious diseases due to inadequate WASH services in schools became high. Hence, since 2010, the JMP has prioritized global monitoring of WASH in schools and healthcare facilities. According to Oluyinka and Adebayo (2019), school-age children constitute about 23% of the population of the average Nigerian community.

In Nigeria, the school environment has direct contact with more than 80% of the nation's population aged 5-17 years for about 7 hours a day, and for a period of up to 13 critical years of their social, psychological, physical, and intellectual development (Ohwo, 2019). For every child, school-age is a critical formative period of rapid growth and development. Even as they are totally dependent and not considered productive as it concerns national income generation, the health status of the school-age and indices are used to determine a nation's state of development.

Safe and adequate water supply is a pre-requisite for the right to basic education for school-age children (Chabo & Akpan-Idiok, 2019). Sufficient and wholesome water supply is considered the most basic and necessary prerequisite for the maintenance and sustenance of healthy living. School, for most individuals, is most often the first contact they make with the environment away from home. Thus, children tend to spend significant and critical number of years learning, growing and developing in such environments (Egbinola & Amanambu, 2015). It has been observed that the level of participation in educational programmes depends on the health status of children. A healthy and mentally alert child is more likely to attend to school activities as required by the curriculum (Ogbe, 2020). Safe water supply caters for some of the most critical students/teachers' needs in schools.

Partly in recognition of the importance of safe drinking water supply in schools, the Federal Government introduced the National School Health Policy (FGN, 2006). Inclusive in it was the school health programme, with her scope covering and ensuring a healthful school environment. According to the Policy, the objectives of the healthful school environment included to provide adequate safe drinking water supply in schools (FGN, 2006). As stated in the Policy, there are conditions required in schools to meet the standard of a safe and healthful physical environment in line with water services. Chabo and Antor (2018), and Folayan *et al*., (2020) observed that in the policy, the conditions required to meet the standard include the presence of provision for safe water, and each water point should serve a maximum of 250 people, and; the water points should be located at least 30 meters from any soak away or toilet.

In order to enjoy the benefits of adequate WASH services in schools, there is need to acquire more reliable and valid data on the actual status of WASH in schools. This is in order to comprehend the extent of issues militating against adequate WASH services in schools and also develop workable intervention strategies to tackle the barriers (Ohwo, 2019). The school approach of enhancing WASH practices could be a veritable route through which the awareness of appropriate and acceptable hygiene and sanitation practices can be entrenched (Olukanni, Ducoste & George, 2014). Schools being the primary agent through which societal change can be brought about could be said to occupy the pride of place as far as it concerns total community sanitation campaign. It has also been established that appropriate and adequate WASH services in schools can enhance health, boost educational accomplishments, improve gender fairness across rural and urban

schools, and bring about a constructive effect influence on communities (Alafin, Adesegun, Izang & Alausa, 2019).

WASH programme in schools within Cross River State has been in implementation since 2012 till date as a result of the WSSSRP II and III programmes (2012-2019), the Nigeria's Country WASH Programme (2014-2017), and the PEWASH programme (2016-2030). In line with the primary objective of the global WASH programme, the objectives of the three programmes in schools include water point rehabilitation and construction. Within secondary schools in Cross River State, observations about the WASH programme appear to show some inconsistencies associated with the programme's implementation vis-à-vis the achievement of its core objectives. Therefore, the extent of provision of the WASH facilities calls for an empirical evaluation.

As a concept, evaluation is often subjected to numerous postulations which usually depend on what is being evaluated, who is evaluating, and the purpose for the evaluation. Generally, evaluation is often associated with obtaining data in order to make a decision or pass an objective judgment (Jenewari & Nwombu, 2019). It is the systematic process of assessing, testing and measuring the extent of success or otherwise of a given programme, for making value judgements (Aboyeji & Eigboghan, 2016) As a process, evaluation involves collecting and analysing information about a collective set of organised activities, characteristics and outcomes concerning criteria intended to be evaluated (Johnson, 2021). The application of the evaluative outcomes leads to the judgment of the effectiveness, efficiency, social utility desirability of a product, process or progress in terms of already carefully defined and agreed upon objectives (Nwigbor & Obilor, 2019).

The importance of an evaluation process is that it helps interventions, institutions, programmes, initiatives or projects to assess any goal, as well as attainable and realizable proposal. It can also ascertain the degree of achievement or value with regards to the main aims and objectives, including also any alternatives in decision making. It is concerned with original aims and objectives, and what was either predicted or accomplished, and how it was accomplished (Jenewari & Nwombu, 2019). Programme evaluation is a well-ordered procedure for collecting, analysing, and using data or information to proffer answers to questions concerning the effectiveness and/or efficiency of projects, policies and programmes (Eneja, Akamigbo & Akujieze, 2020). The extent of accomplishment of set-goals and objectives of a given programme depends on evaluation which must be systematic and strategic. Thus, evaluation in the context of this study involves a well-ordered procedure for collecting, analysing and using the analysed data or information to provide answers to the research questions concerning the implementation of the WASH programme in secondary schools within the area of investigation.

In line with the objectives of the various WASH programmes in schools in Cross River State, it is believed that a systematic evaluation of availability and accessibility of safe drinking water could possibly provide insights into the programmes' progress in schools. Availability and accessibility of safe drinking water refers to the extent to which safe drinking water is available and accessible

for learners and teachers' use in schools. Being one of the core objectives of the WASH programme, it has been reported that lack of or insufficient water leads to dirty school environments, especially dirty toilets (Egbinola & Amanambu, 2015; Alafin *et al*., 2019). Since the implementation of the WASH programme, could it be true to say that there has been availability and accessibility to safe drinking water for learners and teachers in secondary schools in Cross River State?

Since there is no known available and accessible research evidence that the WASH program has ever been subjected to an evaluative study since its inception, there was need to do so. Also, the evaluation of the WASH program in secondary schools in Cross River State can help to provide an empirical information about the extent of success or otherwise of its implementation. Therefore, this study undertook an evaluation of the implementation the WASH programme with specific focus on availability/accessibility of safe drinking water from 2016-2021 in Secondary Schools in Cross River State.

Statement of the Problem

Prior to the introduction and implementation of WASH, lack of safe drinking water in schools was an indicator of risk of transmitting infections and diseases which could cause short term illness and absence from schools. In some other cases, it served as a contributory factor to health and psychological conditions that persisted beyond school and manifested in seriously malignant forms in later life. It mostly affected learners and teachers severely, especially for those with disabilities or additional needs, and children with bladder conditions. With the advent of the WASH program, safe and adequate water supply in schools is considered a pre-requisite for the right to basic education for school-age children. Safe water caters for some of the most critical students/teachers' needs in schools. The WASH programme was implemented in schools within Cross River State since 2012 till date as a result of the WSSSRP II and III programmes (2012-2019), the Nigeria's Country WASH Programme (2014-2017), and the PEWASH programme (2016-2030).

In line with the primary objective of the global WASH programme, the objectives of the three programmes in schools include water point rehabilitation and construction. Since its implementation till date, there is no available and accessible empirical evaluation to ascertain the extent of implementation and achievement of laid down goals and objectives based on available and accessible literature. Therefore, it is not clear if the problems that warranted the implementation of WASH programme in Cross River State are still persistent, have been solved or to what extent the implementation has been done and objectives achieved. Therefore, this study answered the following question - what is the extent of implementation of the WASH programme in secondary schools with specific focus on availability/accessibility of safe drinking water in Cross River State.

Purpose of the Study

The purpose of this study was to evaluate the implementation of the WASH programme in secondary schools with specific focus on availability/accessibility of safe drinking water in Cross River State.

Research Questions

1. To what extent is safe drinking water available in secondary schools?
2. To what extent is safe drinking water accessible in secondary schools?

Literature Review

Provision of available water to fulfil specific needs in terms of both quality and quantity requirements, whether domestic, industrial, or agricultural is referred to as water supply (Bature, Opotu & Mounkaila, 2021). Thus, effective and efficient water supply systems are those that meet requirements for public, commercial, and industrial activities. Water supply projects include reservoirs (for rain catchment and water run-off), dams, wells, etc. Water supply is generally gotten from three major sources which are surface water supply, underground water supply and precipitation. Precipitation includes rain, snow, ice, hail, dew, mist, etc. and it serves as the primary source of water on the surface of the earth (Eneji, Eneji, Asuquo & Ubom, 2015). Underwater ground supplies include springs and wells while surface water supplies include streams, lakes, rivers, seas and oceans.

Adequate water supply is the most crucial prerequisite for the sustenance and maintenance of healthful living. In the event of water supply undergoing improvements, it is accompanied with a corresponding improvement in the health of people (Inah, Ntekim, Nji, Egbonyi & Mboto, 2020). Also, access to sufficient water supply is a strategic step towards a sustainable future. According to UNESCO (2015), progress in all facets of sustainable development is based on the limits fixed by the finite and often vulnerable water resources. Basically, even as water is mostly used for consumption, the other human activities in which water serves as an essential natural resource include – personal hygiene, food production, irrigation, environmental hygiene, industrial processes, recreation, economic development as well as the social and economic transformation of people (Iduseri, Abbas, Izunobi, Ogedegbe & Ogbonna, 2021).

The essence of water for consumption is due to its numerous critical functions within the human system. About 60-75% of the human body is water and it is critical for the continuation of life and homeostasis of the body (Popkin, D'Anci & Rosenberg, 2010). Without adequate hydration, physiological systems within the body would certainly malfunction. Scientists have proven severally that a human being can survive for 3 weeks without food but may not survive after 4 days without water (Rahman & Akter, 2020). Water is not only the number one source of nutrition but also a fundamental necessity for the human body. Other vital functions include serving as a lubricant in the body, regulation of body temperature, Water is needed for the numerous functions of the human body such as assimilation, digestion, sweating, digestion, respiration, brain function, movement, filtration, elimination, maintaining temperature (homeostasis) integrity, strength of all bodily structures, removal of harmful toxins in the body, transporting nutrients throughout the

body, etc. (Khalifa & Bidaisee, 2018). The physical wellbeing and continued existence of every human being depends largely to the extent of accessibility to water deemed fit for consumption.

According to WHO/UNICEF (2014), most people rely on non-piped water and public standpipes such as hand dug wells, boreholes, springs and water vendors for water consumption. The aforementioned sources of water for consumption are all categorised as "improved drinking water sources" (WHO, 2011). An improved drinking water source is a source that is appropriately constructed in a manner that the source is protected (especially from faecal matters and other contaminations from outside) (WHO/JMPR, 2013). On the other hand, surface water sources such as rivers, streams, lakes and ponds and bottled water are categorised as "unimproved drinking water sources since they are not deemed to be protected. Below is a table of the categorisation of improved and unimproved drinking water sources as stipulated by the Joint Monitoring Programme (JMP) for WASH programmes.

Table 1: **Improved and unimproved sources of drinking water by the JMP**

Improved drinking water source	Unimproved drinking water source
• Piped water into dwelling, yard or plot • Public tap or standpipe • Tube-well or borehole • Protected dug well • Protected spring • Rainwater collection	• Unprotected dug well • Unprotected spring • Cart with small tank or drum • Tanker truck • Surface water (river, dam, lake, pond, stream, canal, irrigation channel) • Bottled water

SOURCE: WHO/UNICEF (2014)

Water regulations are necessary to ensure the provision of drinking water has the following characteristics; sufficient in quantity, safe, accessible, acceptable, affordable, and reliable. The regulations involve control of the water supply systems whose components are the water source, water treatment, distribution, use, wastewater and grey water (Dinka, 2018). The regulation of drinking water varies across countries as such is dependent on the quality of their water source. The concept and theory of water quality is very wide-ranging as a result of the many factors that influence it. The quality of water is most often based on the intended uses of water for various objectives, that is, various water uses require various criteria to be satisfied (Dinka, 2018). Depending on the objective of a given water quality analysis, water quality can be viewed based on a set of biological, chemical, and physical variables, which are closely connected to the water's intended use. As a principle, drinking water is expected to be free from toxic chemicals and harmful pathogens (Bos, Alves, Latorre, Macleod, Payen, Roaf & Rouse, 2016).

Clean water is a basic human need. Clean/pure water refers to water that has no minerals and only contains hydrogen and oxygen (Dinka, 2018). Every human being requires at least 20 to 50 litres

of clean, safe water a day for consumption (drinking, cooking, and simply keeping themselves clean) (Rahman & Akter, 2020). Fatal diseases such as cholera, dysentery, hepatitis A and typhoid all occur when contaminated water is consumed. Clean water is necessary not only to stay safe from related diseases but also to maintain good health. Clean, fresh and safe drinking water also enables the human body rid a variety of toxins, whether created due to bodily biochemical reactions, gotten from external sources or ones that occur due to the consumption of contaminated water (Rahman & Akter, 2020).

Safe drinking water is viewed as the water which does not represent any significant risk to an individual's health over a lifetime of consumption (Fogden & Wood, 2009). For the WASH Joint Monitoring Programme (JMP), safe drinking water refers to water from an "improved water source," (this includes boreholes, household connections, protected dug wells, protected springs, public standpipes and rainwater collections (WHO/UNICEF, 2014). Safe drinking water (at times referred to potable water) is water delivered to the user which is safe for consumption and personal hygiene (Bos *et al*., 2016). According to Stanley, Ugboma, Okeke, Olodiama, Odubo and Oboro (2018) potable water refers to any water that is good for drinking without fear of disease or poisoning.

Ideally, drinking water should actually be safe and acceptable to all. Guidelines on the quality of safe drinking water as provided by WHO indicates standards in terms of chemical, microbial, and radionuclide content, in addition to physical properties for safe drinking water (WHO, 2011). When delivering safe drinking water, it must meet the required biological, chemical and physical quality standards at the point of supply to the users, thus the safe drinking water must be delivered that is healthful, potable, pure and wholesome (Dinka, 2018). Being that water regulations, standards and guidelines vary among countries, safe drinking water is often seen as a relative term due to the difference in different quality parameters. The following are some definitions of safe water delivery-related terms as given by JMP in WHO/UNICEF (2014):

a. Water availability refers to both reliability of service provisions and sufficient quantities.
b. Adequacy refers to each of quality and quantity of water.
c. Reliability refers to sustained continuity of service provisions for the current and future generation, and covered under the principles of resilience, sustainability, and system robustness.
d. Acceptability refers to the aesthetic value of water. This implies the acceptable appearance, odour and taste of water. It is highly subjective parameter which mostly depends critically on the perceptions of the local ecology as influenced by culture, education and experience, thus, there is no set explicit and objective global acceptability standards.
e. Accessibility to water refers to the convenience to a reliable supply of water on a continuous basis close to the point of demand within everyone's reach – (home, school, work, public places, etc). It is depicted by the distance of water source from where demanded (30 minutes-walk or 0.2 km).

Basically, everyone needs access to safe drinking water in adequate quantities for consumption, personal hygiene and sanitation which do not compromise health or human dignity. Thus, as declared by the United Nations and ratified by almost all the countries of the world in 2010, access to safe, dependable, clean and fresh water is a fundamental/basic right of humans (Samra & Fawzi, 2011). Declaring access to safe drinking water as a right is predicted as a strategic step toward improving living standards worldwide. Research evidences abound which indicate that access to safe drinking water has a variety of direct and indirect benefits related to education, the environment, health, and poverty. The UNESCO (2015) World Water Development Report revealed that there is a nexus or connection between water and sustainable development, far beyond its economic, environmental and social dimensions. The report explicitly indicates that access to safe drinking water has a strategic role in addressing the development-related issues, such as climate change, food and energy security, human health, industrial growth, and urbanization. Especially, the report reveals a very strong is a strong linkage between water, food and energy (Bos *et al*., 2016).

Galamaji, Aisha and Hafsat (2018) researched on soil-transmitted helminths among Nigerian primary school pupils. Study's posers included verifying the sources of drinking water in schools and the result showed that 101 (50.5%) indicated borehole, 76 (38%) reported well water while 23 (11.5%) stated pipe-borne. Mudassiru, Suleiman, Dibal, Abdulhamid and Abba (2018) examined prevalence of schistosomiasis among primary school pupils in Nigeria. The study's aims included assessing the sources of drinking water in school and the result showed that 216 of the respondents indicated surface water (rivers, streams, reservoirs, etc.), 89 of them reported well water while 55 reported tap/borehole. Ogunmakin (2018) probed community participation/ownership in sustainability of water and sanitation programme in primary and secondary schools in Nigeria. One of the study's research questions centred on ascertaining the main sources of water supply in schools across the state and the result showed that borehole provided 21% of water supply in schools across the state, well water 8%, pipe borne water 3%, other water sources 1% while no source at all was 67%.

Adamu, Dzikwi, Akefe, Alimi, Adikwu, Idoko, Kore, Okita, Yikawe, Bello, Lamai and Kolo (2019) explored prevalence and risk factors associated with urinary schistosomiasis among Nigerian secondary school students. One of the study's aims was to verify the drinking water sources for the students in school. It was revealed that 428 (53.5%) of them indicated well, 164 (20.5%) reported borehole, 140 (17.5%) stated tap water while 68 (8.5%) indicated surface water (rivers, streams, ponds, etc.,). Agbo, Agere, Dawuda, Agatsa and Alfred (2019) assessed prevalence of intestinal parasites among primary school pupils in Nigeria. The study's objectives involved examining the drinking water sources in schools. The result showed that 135 indicated surface water (streams and rivers), 23 reported tap waters while 22 stated well water. Muhammad, Abdullahi, Bala and Shinkafi (2019) determined prevalence of urinary schistosomiasis among primary school pupils in Nigeria. One of the study's enquiries was to ascertain the sources of

drinking water for the pupils in school and the result showed that 301 indicated well water as their source of drinking water, 97 reported tap waters while only 2 of them indicated surface water.

Amadi, Yakubu, Iro, Azuamah, Amadi and Ukah (2020b) probed water supply and bacteriological qualities of drinking water in primary schools in Nigeria. An enquiry of the drinking water sources in schools and it was revealed that 463 (30.6%) reported borehole, 383 (25.3%) indicated pipe borne water, 350 (23.1%) reported self-sourced bottle/sachet water, 142 (9.4%) indicated well/spring water, 106 (7.0%) reported no source at all, 27 (1.8%) indicated rainwater catchment, 24 (1.6%) reported surface water (lake/river/stream) while 18 (1.2%) indicated cart/tanker/truck. Inclusive in the finding was that 1004 (66.3%) reported that the water source was within the school compound while 510 (33.7%) said the water source was outside the school compound. Lastly, 623 (41.1%) of the respondents reported that the water from its source was always treated before they drank in school, 361 (23.8%) indicated that the water was sometimes treated while 530 (35.1%) reported that the water from the source was never treated before they drank it.

Ayuba, Danladi, Ombuagdu, Pam, Njila, Nkup, Luka and Mamot (2020) examined prevalence and associated risk factors of urinary schistosomiasis among Nigerian primary school pupils. An enquiry of the sources of drinking water in school was conducted. Data analysis showed that 77 indicated well water, 39 reported tap water while 2 each reported surface water and pipe borne water, respectively. Chidiebere, Nwobu and Mgbowula (2020) investigated prevalence of urinary schistosomiasis among primary school pupils in Nigeria. Inclusive in the study's purpose was to examine the sources of drinking water in schools. The result showed that 390 reported self-purchased sachet waters, 130 indicated water from a borehole, 80 reported waters from wells and 20 of them indicated pipe borne water source. Hassan, Fagbemi, Ogungbemi and Adedini (2020) probed Nigerian secondary school students' sanitation practices. The study's posers included verifying from the students their source of safe drinking water in school and the result showed that 102 (53.1%) of them indicated tap water, 86 (44.8%) reported borehole, 3 (1.6%) stated bottle/sachet water while 1 (.5%) indicated well water.

Ojukwu and Chukwu-Okeah (2020) assessed water supply and toilet facilities across Nigerian primary schools. The study's enquiries included ascertaining sources of drinking water supply, sufficiency of daily water requirements and prevalence of water supply challenges in schools. The result revealed that 81 (43.9%) indicated surface water (river, stream, pond), 55 (30.0%) said borehole, 38 (20.7%) reported rain water while 10 (5.4%) stated that it was from hand-dug wells. 138 (75%) stated indicated "no" to sufficiency of daily water requirements while 46 (25%) reported "yes". Lastly, 178 (96.7%) reported "yes" to prevalence of water supply challenge while 6 (3.3%) reported "no". Okusaga, Ombugadu, Yako and Amuga (2021) explored microscopic/molecular detection of *entamoeba histolytica* among Nigerian primary school pupils. Data obtained from the respondents included an assessment of drinking water source in school. The result revealed that tap water was the drinking water source for 72 (22.50%), well/borehole was for 213 (66.56%) while stream/river was for 35 (10.94%).

Sanni, Offiong, Anigilaje, Airede and Imam (2021) conducted a pre-COVID-19 assessment of school health programme in Nigerian primary schools. The study inquired schools' accessibility of pipe-borne water, main source of water supply in schools, and location of school water source (within or outside school premises). The result showed that while 58 (39.7%) of the schools had access to pipe-borne water, 88 (60.3%) did not have. 75 (51.4%) reported that borehole was the main source of water, well water was the main source for 11 (7.5%) of them while surface water was the main source for 4 (2.7%) of them. Lastly, it was revealed that 79 (54.1%) had their source of water located within the school premises while 67 (45.9%) did not have their water source located within the school premises.

Aleru and Jime (2022) assessed potable water supply and toilet facilities as components of healthful school environment in secondary schools in Nigeria. One of the study's research questions enquired water-related issues in schools. The result revealed the following – (i) 847 (84.7%) agreed that staff and students regularly complained about lack of safe drinking water supply while 153 (15.3%) disagreed; (ii) 838 (83.8%) disagreed that there was sufficient water supply while 162 (16.2%) were in agreement, and; (iii) 832 (83.2%) disagreed that water supplied in school is safe for consumption while 168 (16.8%) agreed. Olabimpe, Mohammed, Omotayo, Ayodele, Samson and Taye (2022) assessed implementation of school health programmes in Nigerian primary schools. Inclusive in the study's aims was to verify the main water sources for schools and their location (within or outside the school premises). Data analysis showed that for 32 (25.0%) of the schools it was pipe borne water, for 44 (34.4%) it was borehole/mono-pump, for 48 (37.5%) it was a well while 4 (3.1%) had no main source of water. The result also showed that 83 (64.8%) of the schools had their source of water within the school premises while 41 (32.0%) had theirs outside the school premises.

Methodology

An evaluation research design was utilized for the study. The study was conducted in Cross River State. All secondary school teachers (4,430) and SS2 students (16,662) in the area served as the population (Planning, Research and Statistics Department, Cross River State Secondary Education Board, 2022). Multi-stage sampling procedure was used, Purposive and Simple random sampling technique were employed to select 698 respondents for the study. A questionnaire tagged "Checklist on Availability/Accessibility of Safe Drinking Water" (CAASDW) was used for collecting data. The reliability estimate method used was Cronbach Alpha and the result was .90. Mean scores were used for data analysis. Each of availability and accessibility of safe drinking water in schools were evaluated and analyzed using judgmental mean and standard deviation (SD) scores. The key for the judgmental mean scores is as follows - VLE = Very Lowly Extent, LE = Lowly extent, HE = Highly Extent, VHE = Very Highly Extent.

Presentation of Results

Research Question One: To what extent is safe drinking water available in secondary schools?

Table 2: Mean and SD scores of extent of the availability of safe drinking water in secondary schools

S/N	Item Statement	Mean ($\bar{x}$)	SD	Decision
1	Streams are available for drinking	1.81	.962	VLE
2	There is pipe borne water in school for drinking	2.15	.953	LE
3	There are wells in school for drinking	2.10	.943	LE
4	My school supplies sachet/bottle water for drinking	3.05	.860	VHE
	Cluster mean	2.27	.521	LE

The result in Table 2 shows the mean scores of students and teachers on the extent to which safe drinking water is available in secondary schools. The results show that their mean scores ranged from 1.81 to 2.10 for items 1, 2, and 3. This implies that the extent safe water is available in secondary schools is low (2.50). However, the mean scores of the respondents on item four was 3.05, indicating that the safe sachet and/or bottle water are available in secondary schools to a high extent. Furthermore, the SD values for all the items ranged from 0.860 to 0.962 for all the items. The close nature of the SD values indicates that the responses of the respondents are similar. Moreover, the overall mean response of the respondents is 2.27 with SD value of .521. The result implies that the extent of availability of safe drinking water in secondary schools is low.

Research Question Two: To what extent is safe drinking water accessible in secondary schools?

Table 3: **Mean and SD scores of the extent of accessibility of safe drinking water in secondary schools**

S/N	Item Statement	Mean ($\bar{x}$)	SD	Decision
1	The most accessible source of drinking water in my school in borehole	2.40	.560	LE
2	The most accessible source of drinking water in my school in stream	2.10	.778	LE
3	The most accessible source of drinking water in my school in sachet/bottle water	3.32	.579	VHE
	Cluster mean	2.41	.460	LE

The results in Table 3 show the mean and SD scores of students and teachers on the extent to which safe drinking water is accessible in secondary schools. The result shows that their means scores are 2.49 and 2.19 for items 1 and 2 respectively. This implies that the extent to which safe water is accessible in secondary schools is low . However, the mean score of the respondents on item three was 3.05, indicating that sachet and or bottle water are accessible to a high extent in secondary schools. Furthermore, the SD values for all the items ranged from 0.560 to 0.778 for all the items. The close nature of the SD values indicates that the responses of the respondents are

similar. Moreover, the overall mean response of the respondents is 2.41 with SD value of .460. The result implies that safe drinking water is accessible in secondary schools to a low extent.

Discussion

The findings of the study revealed that the extent of availability and accessibility of safe drinking water in secondary schools is low. This means that there is scarcity of safe drinking water in secondary schools in Cross River State. This finding is supported by the findings from the interview where majority of the respondents stated that the major source of safe drinking water in secondary schools is sachet water. The above findings are consistent with previous findings by Chidiebere *et al*., (2020) who revealed that of a sample of pupils who were investigated for water supply sources in their schools, 390 reported self-purchased sachet waters, 130 of them indicated water from a borehole, 80 of them reported water from a well and 20 of them indicated pipe borne water source. The findings are also in line with that of Aleru and Jime (2022) who revealed that 84.7% of staff and students regularly complained about lack of safe drinking water supply. This is so because many governments do not provide safe sources of drinking water in schools. Hence, majority of teachers and students depend on purchased sachet water for drinking.

Conclusion

Based on findings of this study, it was concluded that the extent of availability of safe drinking water in secondary schools is low, safe drinking water is accessible in secondary schools to a low extent. The findings have implication for students and teachers. The implication of this finding is that students and teachers do not have safe drinking water to drink. This poses a threat to their lives especially the students who may resort in drinking any water that is available. This may result to the outbreak of disease or ill health. This may also lead to death of students and teachers as a result of water borne diseases such as cholera, typhoid, among others. This may have serious impact on attendance and turn-out rate in schools. Hence, government, school proprietors and other critical stakeholders in the education sector must ensure that there is safe drinking water in secondary schools for teachers and students.

Recommendations

From the findings of this study, it is recommended that Government and school administrators should provide boreholes and other safe sources of drinking water in secondary schools.

References

Aboyeji, O. S., & Eigbokhan, S. F. (2016). Evaluations of groundwater contamination by leachates around Olusosun open dumpsite in Lagos metropolis, southwest Nigeria. *Journal of Environmental Management*, 183, 333-341

Adamu, A. M., Dzikwi, A. A., Akefe, O. I., Alimi, Y. A., Adikwu, A. A., Idoko, S. I., Kore, M., Okita, A. O., Yikawe, S. S., Bello, S. G., Lamai, R. S., & Kolo, R. L. (2019). Epidemiology of urinary schistosomiasis among secondary school students in Kaduna State, Nigeria. *Journal of Community Medicine and Health Education, 9*(2), (e-journal). Retrieved on 11/07/2022 from 10.4172/2161-0711.1000650

Agbo, O. J., Agere, H. I. J., Dawuda, B. M., Agatsa, T. D., & Alfred, A. A. (2019). Prevalence of intestinal parasites among children in selected primary schools in Katsina-Ala Local Government Area of Benue. *FUW Trends in Science & Technology Journal, 4*(2), 478-482

Akwataghibe, N., Wegelin, M., Postma, L., Fajemisin, W., Banda, M. M., Khan, F., Jurji, Z., & Toonen, J. (2018). Exploring equity focus of the SHAWN WASH programme in Nigeria. *Journal of Water, Sanitation and Hygiene for Development*, (e-journal). doi: 10.2166/washdev.2018.020

Alafin, B., Adesegun, O. A., Izang, J. A., & Alausa, K. O. (2019). An appraisal of the School Health Programme in primary schools in a rural community in Nigeria. *Ethiopian Journal of Health Development, 33*(3), 153-159

Aleru, O. O., & Jime, H. K. (2022). Assessment of portable water supply and toilet facilities as components of healthful school environment in public and private secondary schools in Ilorin, Kwara State. *Global Journal of Health Related Researches, 4*(1), 94-99

Amadi, C. O. A., Yakubu, M. B., Iro, O. K., Azuamah, Y. C., Amadi, A. N., & Ukah, A. (2020). Water supply and bacteriological qualities of drinking water in primary schools of North Central Nigeria. *International Journal of Research and Review, 7*(4), 406-412

Ayuba, S. O., Danladi, G. S., Ombuagdu, A., Pam, V. A., Njila, H. L., Nkup, C. D., Luka, I., & Mamot, L. P. (2020). Prevalence and associated risk factors of urinary schistosomiasis among primary school pupils of Agyaragu Community, Lafia LGA, Nasarawa State, Nigeria. *Acta Scientific Biotechnology, 1*(5), 08-12

Bature, A. S., Opotu, L. A., & Mounkaila, N. (2021). Evaluation of water supply and sanitation situation in Kaduna Metropolis in Northern Nigeria. *Public Health Research, 11*(1), 1-14

Boeren, E. (2019). Understanding Sustainable Development Goal (SDG) 4 on "quality education" from micro, meso and macro perspectives. *International Review of Education*, (e-journal). https://doi.org/10.1007/s11159-019-09772-7

Bos, R., Alves, D., Latorre, C., Macleod, N., Payen, G., Roaf, V., & Rouse, M. (2016). *Manual on the human rights to safe drinking water and sanitation for practitioners*. London, UK: IWA Publishing

Chabo, J. A. U., & Antor, N. (2018). Implementing Healthful School Environment as a component of School Health Programme (SHP) in selected secondary schools in Calabar Municipality, Cross River State, Nigeria. *Scholars Journal of Applied Medical Sciences (SJAMS), 6*(3), 1340-1354

Chabo, J. A., & Akpan-Idiok, P. A. (2019). Utilization of School Health Programme (SHP) Facilities and Factors Affecting Implementation in Secondary Schools in Calabar Municipality, Cross River State, Nigeria. *Greener Journal of Medical Sciences, 9*(1), 01-11

Chidiebere, O. G., Nwobu, R. A. U., & Mgbowula, G. I. (2020). Prevalence of urinary schistosomiasis among primary school pupils in Abuja Municipal Area Council Abuja, Nigeria. *International Journal of Progressive Sciences and Technologies (IJPSAT), 23*(1), 416-423

Dinka, M. O. (2018). Safe drinking water: Concepts, benefits, principles and standards. In M. Glavan (Ed.), *Water challenges of an urbanizing world* (pp. 163-182), EBook ISBN - 978-953-51-4049-8. Retrieved on 10/07/2022 from http://dx.doi.org/10.5772/intechopen.71352

Egbinola, C. N., & Amanambu, A. C. (2015). Water supply, sanitation and hygiene education in secondary schools in Ibadan, Nigeria. *Bulletin of Geography - Socio-Economic Series*, 29, 31–46

Eneja, R. U., Akamigbo, I. S., & Akujieze, M. O. (2020). Evaluation of Accounting Education Programme in Colleges of Education in South East Nigeria. *Journal of Education and Practice, 11*(8), 39-45

Eneji, C. V. O., Eneji, J. E. O., Asuquo, I., & Ubom, B. A. E. (2015). Water, Sanitation and Hygiene (WASH) in community disease control in Cross River State, Nigeria. *International Journal of Environmental Science and Toxicology Research, 3*(9), 173-181

Federal Government of Nigeria (FGN). (2006). *National School Health Policy*. Abuja: Federal Ministry of Education

Federal Government of Nigeria (FGN). (2016). *Partnership for Expanded Water Supply, Sanitation & Hygiene (PEWASH) Programme Strategy 2016-2030*. Abuja: Federal Ministry of Water Resources. http://www.washpmp.com>

Federal Government of Nigeria (FGN). (2020). *Evaluation of the UNICEF supported Federal Government of Nigeria Water, Sanitation and Hygiene Programme (2014-2017) - Final Report*. Sheffield, UK: International Organization Development (IOD) PARC Ltd. Retrieved on from https:// www.unicef.org>file

Fogden, J., & Wood, G. (2009). *Access to safe drinking water and its impact on global economic growth*. Bothell, WA, USA: HaloSource Inc

Folayan, M. O., Obiyan, M. O., & Olaleye, A. O. (2020). Association between water, sanitation, general hygiene and oral hygiene practices of street-involved young people in Southwest Nigeria. *BMC Oral Health, 20*(32), (e-journal). https://doi.org/10.1186/s12903-020-1022-z

Galamaji, M. M., Aisha, A., & Hafsat, A. L. (2018). Epidemiological study of soil-transmitted helminthic among primary school pupils in Jega, Kebbi State, Nigeria. *South Asian Journal of Parasitology, 1*(4), 1-7

Hassan, Y. O., Fagbemi, K. B., Ogungbemi, A. O., & Adedini, A. J. (2020). Students' sanitation practices in Lagos: A case study of selected secondary schools in Ifako Ijaye Local Government Area, Lagos State. *Open Access Journal of Environmental and Soil Sciences, 5*(1), 579-586

Iduseri, E. O., Abbas, I. I., Izunobi, J. U., Ogedegbe, S. O., & Ogbonna, D. O. (2021). Access to safe drinking water in developing countries: A comparative analysis of the urban and rural areas of Zaria, Kaduna State, Nigeria. *Journal of Applied Science and Environmental Management, 25*(11), 1869-1878

Inah, S. A., Ntekim, V. E., Nji, E. L., Egbonyi, D. E., & Mboto, F. E. (2020). Assessment of water supply and sanitation facilities in public primary schools in Calabar South Local Government Area, Cross River State, Nigeria. *New York Science Journal, 13*(7), 43-51

Jenewari, E. T., & Nwombu, U. K. (2019). Evaluation of Primary School Cultural and Creative Arts Curriculum Implementation in Universal Basic Education in Rivers State. *International Journal of Scholarly and Educational Research in Africa, 12*(5), 17-33

Johnson, O. (2019). General System Theory and the use of process mining to improve care pathways. In P. Scott, A. Georgiou, & N. De Keizer, (Eds.), *Applied interdisciplinary theory in health informatics*, (pp. 11-22). ISBN Online: 978-1-61499-991-1. Retrieved on 17/10/2022 from https://www.iospress.nl/book/applied-interdisciplinary-theory-in-health-informatics/

Khalifa, M., & Bidaisee, S. (2018). The importance of clean water. *Scholar Journal of Applied Sciences and Research, 1*(7), 17-20

Mudassiru, I., Suleiman, A. B., Dibal, D. M., Abdulhamid, Y., & Abba, A. M. (2018). Prevalence of urinary schistosomiasis among school aged children in Bakura Local Government Area of Zamfara State Nigeria. *UMYU Journal of Microbiology Research, 3*(2), 7-13

Muhammad, I. A., Abdullahi, K., Bala, A. Y., & Shinkafi, S. A. (2019). Prevalence of urinary schistosomiasis among primary school pupils in Wamakko Local Government, Sokoto State, Nigeria. *The Journal of Basic and Applied Zoology, 80*(22), (e-journal). Retrieved on 12/07/2022 from https://doi.org/10.1186/s41936-019-0093-3

Nwigbor, J. D., & Obilor, E. I. (2019). Evaluation of the objectives of the Universal Basic Education Programme in Rivers State. *International Journal of Education and Evaluation, 5*(2), 30-48

Ogbe, O. J. (2020). Appraisal of the implementation of the National School Health Policy in secondary schools in Nigeria. *Academic Journal of Interdisciplinary Studies, 9*(2), 149-156

Ogunmakin, R. (2018). Community participation and ownership in sustainability of department for international development water and sanitation programme in Nigerian schools. *Gombe Journal of Education (GOMJE), 2*(1), 179-188

Ohwo, O. (2019). Status of water, sanitation and hygiene facilities in public secondary schools in Yenagoa, Nigeria. *World Journal of Social Sciences and Humanities, 5*(3), 176-183

Ojukwu, C. K., & Chukwu-Okeah, G. O. (2020). Assessment of water supply and toilet facilities in selected primary schools of Kolo Creek Area, South-South Nigeria. *International Journal of Research and Scientific Innovation (IJRSI), VII*(XII), 89-94

Okusaga, F. R., Ombugadu, R. J., Yako, A. B., & Amuga, G. A. (2021). Microscopic and molecular detection of entamoeba histolytica in selected public primary school pupils of Bwari Area Council, F.C.T Abuja, Nigeria. *European Journal of Biology and Biotechnology, 2*(3), 57-60

Olabimpe, K., Mohammed, A., Omotayo, A., Ayodele, O., Samson, O., & Taye, O. O. (2022). Assessment of school health programmes implementation in Nigeria primary schools. *International Journal of Community Medicine and Public Health, 9*(5), 2055-2065

Olukanni, D. O., Ducoste, J. J., & George, T. O. (2014). *Creating Water, Sanitation and Hygiene (WASH) program awareness in schools: A tool towards the success of community WASH Program*. Proceedings of EDULEARN14 Conference held from 7th-9th July 2014 at Barcelona, Spain. http://m.covenantuniversity.edu.ng>

Oluyinka, D., & Adebayo, A. M. (2019). School Health Program in Nigeria: A review of its implementation for policy improvement. *American Journal of Educational Research, 7*(7), 499-508

Popkin, B., D'Anci, K., & Rosenberg, I. (2010). Water, hydration, and health. *Nutrition Reviews*, 68, 439-458

Rahman, H., & Akter, R. (2020). Importance of safe drinking water for human life. *Research: Molecular & Cellular Clinical Biochemistry, 1*(1), 1-5

Samra, S. C. J., & Fawzi, S. C. M. (2011). The right to water in rural Punjab: Assessing equitable access to water through the Punjab rural water supply and sanitation project. *Health and Human Rights, 13*(2), 36-49

Sanni, U. A., Offiong, U. M., Anigilaje, E. A., Airede, K. I., & Imam, A. (2021). A pre-COVID-19 assessment of aspects of the school health programme in some selected Nigerian primary schools: Implications for school re-opening during the COVID-19 pandemic in developing country contexts. *BMC Public Health, 21*(1214), (e-journal). Retrieved on 15/07/2022 from https://doi.org/10.1186/s12889-021-11258-x

Stanley, H. O., Ugboma, C. J., Okeke, V. C., Olodiama, E., Odubo, E. G., & Oboro, T. E. (2018). Potable water and sanitation practices among pupils in some selected primary schools in Yenagoa, Bayelsa State, Nigeria. *Asian Journal of Advanced Research and Reports, 2*(4), 1-8

United Nations (UN). (2015). *Water, Sanitation and Hygiene (WASH) for all initiative – SDG Action 1665*. https://sustainabledevelopment.un.org

United Nations Scientific and Cultural Organization (UNESCO) (2015). *Water for a Sustainable World - The UN World Water Development Report*. Paris, France: UNESCO

United Nations' Children's Fund (UNICEF) (2008). *Frequently asked questions on sanitation and hygiene*. Abuja: UNICEF Office

World Health Organization (WHO) (2011). *Guidelines for drinking water quality*. Geneva: World Health Organization

World Health Organization and Joint Monitoring Programme Report (WHO/JMPR). (2013). *Water sanitation health*. Available at https://www.who.int/water_sanitation_health/monitoring/jmp_fast_facts/en/

World Health Organization/United Nations' Children's Fund (WHO/UNICEF). (2014). *Progress on drinking water and sanitation: 2014 update*. Geneva, Switzerland: WHO