

**SAFE WATER SUPPLY: STRATEGY FOR ENHANCING WASH-RELATED  
PRACTICES TOWARDS SUSTAINABLE, HEALTHY AND RESILIENT  
COMMUNITIES IN CROSS RIVER STATE.**

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***Abstract***

Contemporarily in emerging economies, WASH-related practices are gradually being perceived as a significant contributory panacea for issues such as increasing vulnerabilities to malnutrition and food insecurity; health and environmental hazards; unsustainable consumption and production patterns, and; unsustainable exploitation of natural resources. Applying a theoretical approach, an extensive review of literature on the relationship, influence and/or predictability of safe water supply as a strategy for ameliorating issues of malnutrition and food insecurity; health and environmental hazards; unsustainable consumption and production patterns, and; unsustainable exploitation of natural resources vis-à-vis literature on safe water supply in Cross River State was undertaken. From the extensive review of literature, it appears that safe water supply is a significant determinant towards ameliorating issues concerning malnutrition and food insecurity; health and environmental hazards; unsustainable consumption and production patterns, and; unsustainable exploitation of natural resources while safe water supply in Cross River State appears to be facing insurmountable challenges. In conclusion, without regular and sufficient safe water supply, a given community would always find itself prone to increasing vulnerabilities to all of malnutrition and food insecurity; health and environmental hazards; unsustainable consumption and production patterns, and; unsustainable exploitation of natural resources. Thus, for the prevalence of sustainable, healthy and resilient communities in Cross River State, safe water supply has to be revamped.

**Key words:** safe, water, vulnerability, sustainability, health

**Introduction**

Since 1990, the United Nations International Children's Emergency Fund (UNICEF) and the World Health Organisation (WHO)'s Joint Monitoring Programme (JMP) for water supply, sanitation and hygiene have made significant efforts to ensure that the three areas

are given increasingly prime attention due to the belief that the impacts of each of their deficiencies strongly overlap (WHO, 2017). The continued development of the water supply, sanitation and hygiene monitoring programme have since brought about the WASH acronym which connotes “Water, Sanitation and Hygiene”. In 2010, as part of a United Nations (UN) General Assembly explicitly recognized water and sanitation as human rights by stating that they (water and sanitation) are necessary for the full enjoyment of mankind’s life and all human rights (UNICEF, 2016). During a historic UN Summit in late 2015, the importance of the aforementioned areas was again brought to the fore when the outcome of the summit revealed that they were to be designated a goal among the proposed Sustainable Development Goals (SDGs) – SDG 6 which is to “ensure availability and sustainable management of water and sanitation for all” (Klarin, 2018).

In a report by the International Council for Science (ICSU) and International Social Science Council (ISSC) in 2015 on a science perspective towards reviewing the SDGs’ targets, it was observed that each of the SDGs’ was interrelated to other ones. From the report, SDG 6 was reported as one of those unique goals found to be interrelated to all of the other goals (ICSU & ISSC, 2015). In addition, some other goals which were perceived as being interrelated to all the other goals were SDGs 2 (hunger, food security and nutrition), 3 (healthy lives and well-being for all), 12 (sustainable consumption and production), and a combination of 14 and 15 (sustainable utilisation of natural aquatic and terrestrial resources). According to Subramaniam and Selvavinayagam (2018), WASH is one of the critical dimensions of the SDGs without which attaining any of the global food, health, consumption and resources’ exploitation-related goals may be a mirage. Ostensibly, this could probably connote that vulnerabilities to global food, health, consumption and resources’ exploitation-related issues might be more intense in the event of poorly implemented WASH-related programmes.

Ramesh, Blanchet, Ensink and Roberts (2015) opined that urgent and effective WASH interventions are essential for saving human lives across a variety of crises and complex situations plaguing mankind as a result of issues of conflict coupled with forced migrations, disease outbreaks, public health emergencies, and acute/chronic malnutrition. Poorly implemented WASH programmes have been found to contribute significantly to faecally-transmitted infections (FTIs) (including diarrhoeal diseases and environmental enteropathy/intestinal worms) which has persisted as one of the most pronounced cause of morbidity and mortality among children aged from five and below (Bartram, 2014) and also, the leading cause of disease-related death cases in sub-Saharan Africa (Hutton & Chase, 2016). People are very likely to face acute undernourishment and being stunted when exposed to FTIs (Strunz *et al.*, 2014). The essence of the above stated links has led to a strong consensus that WASH is essentially a “nutrition-sensitive intervention” to address undernourishment among residence of local communities.

Poorly implemented WASH programmes are also significantly associated with malaria, polio and neglected tropical diseases (NTDs) (e.g., helminths, schistosomiasis, guinea worm, and trachoma) that are known to have debilitating impact on children and their

families (WHO, 2012). The degradation of natural aquatic and terrestrial resources through pollution and over-use is increasingly having an impact on access to safe drinking water, most especially for the vulnerable (the poor, aged and to some extent, women) (Hamilton, Gale & Pollard, 2006). Presently, about 1.7 billion people live in water basin areas where water utilisation exceeds its natural recharge capabilities, with consequences including drying up of streams and rivers, depleted aquifers and deteriorating ecosystems vis-à-vis the risk to inadequate WASH interventions that put safe and sustainable drinking water at risk (Campbell *et al.*, 2017). Also, about 160 million children presently live-in areas of extremely high drought severity while over half a billion children live in extremely high flood occurrence areas (UNICEF, 2016).

Following the brief background above, this study examined the views of numerous scholars on the relationship, influence and/or predictability of safe water supply as a strategy for ameliorating issues of malnutrition and food insecurity; health and environmental hazards; unsustainable consumption and production patterns; unsustainable exploitation of natural resources, and; literature on safe water supply in Cross River State. An examination of the views was in order to verify the following poser – can safe water supply serve as a strategy for enhancing wash-related practices towards sustainable, healthy and resilient communities in Cross River State?

## **Literature Review**

For purpose of clarity, the review is carried out under the following sub-headings;

### **(i) Safe Water Supply and Malnutrition/Food Insecurity**

Okonkwo, Okorie and Okonkwo (2011) analysed public health status of supplied water to a Nigerian town and discovered that the potable water supplied had a very unappreciable microbial content and that this had implications for the nutritional status of the people. In a related study, Adeleye, Medayese and Okelola (2014) surveyed outcomes of problems of water and sanitation in a Nigerian urban area and observed the following - water supply was very erratic and irregular, and; the respondents were sceptical of using the water as most of the supplied water was very contaminated and unfit for most domestic uses, thus serving to undermine their food security in the event of using it. In their finding from a study in a western Nigerian state, Olukanni and Okorie (2015) found out that inadequate nutrition and dieting was closely associated with inadequate water supply.

Schlegelmilch, Lakhani, Saunders and Jhangri (2016) evaluated water, sanitation and hygiene program outcomes in Kenya and found out that the programme contributed significantly to enhancing the nutritional status of the people through their improved hygiene behaviour. In Kenya, Mwase, Mutoro, Owino, Garcia and Wright (2016) reported that inadequate water supply was found to be associated with a high prevalence of malnutrition and poor feeding. Tofail *et al.*, (2018) ascertained that in Bangladesh, water quality, sanitation and hygiene behaviour all had statistically significant associations with the quality of children's development.

**(ii) Safe Water Supply and Health/Environmental Hazards**

Perspectives on domestic water supply, sanitation and health in Ghana were examined by Kabila (2010). The study's finding not only showed a significant association between water sources and guinea worm and diarrhoea but also, diseases associated with water and sanitation topped the top ten causes of morbidity and mortality in the area. Nemes (2014) examined the drive of a WASH programme in Tanzania and revealed that construction of toilets, provision of water and hygiene education based on the programme's effectiveness had impacted significantly on the recipients of the programme. Akter and Ali (2014) investigated the effect of a WASH programme in Bangladesh and observed that not only did latrine ownership increase through financial assistance but also, cleanliness of latrines and availability of each of soap and water were significantly improved upon among the locals.

Ekong (2015) assessed the sanitation/hygiene conditions in a Nigerian urban area and found out that most of the respondents (77 percent) had tap water as their water source, most of them (69 percent) had flush toilets in their residence and about 63 percent of them indicated that they always covered their toilets. Orimoloye *et al.*, (2015) revealed that improved water supply in a Nigerian urban area led to improved hygiene behaviours and reduced incidences of water/sanitation borne diseases. In Nigeria, Eneji, Eneji, Asuquo and Ubom (2015) reported that WASH behaviour and practices were found to serve as a significant correlate of incidences of WASH related health complications. In a study in Tanzania, Nyanza *et al.*, (2016) found out that based on the outcome of a WASH programme, about 62 percent of the people had access to safe water supply, yet open defecation was practiced by about 53% of them and incidences of diarrhoea was very prevalent among them. It is noteworthy that the investigated people are nomadic pastoralists.

In a study on hand washing knowledge and practices in Ghana, Dajaan (2016) observed that majority of the persons were ignorant of a wide range of knowledge and practices concerning hand washing and these were attributed to the absence of a WASH programme in the area. Azuogu, Ilo, Nwimo, Azuogu and Onwunaka (2016) examined extent of hand washing behaviour in a Nigerian state (both in urban and rural areas) and observed that a worrisome level of water supply was synonymous with a very poor extent of hand washing behaviour among the people. Tetteh-Quarcoo *et al.*, (2016) probed the microbial content of hand washing basins used in rural areas in Ghana and found out that there existed a wide range of harmful microbes (bacteria, fungi and micro-parasites) within the hand washing basins. The significance of this study is that there was no implemented WASH programme in the investigated area.

In a western Nigerian state, Olowe, Oluyeye and Famurewa (2016) reported that quality of drinking water sources was found to be significantly associated with prevalence of waterborne diseases. Lawrence *et al.*, (2016) revealed that based on community members' perceptions, a community-based WASH programme in Zambia not only led to a perceived reduction in diarrheal-related diseases but also a reduction in infant

mortality. Daramola and Olowoporoku (2016) reported that inadequate water supply in a western Nigerian city was associated with poor environmental sanitation practices and relatively high lack of sanitation facilities in many households. In a study on environmental sanitation practices in a Nigerian city, Sadiq, Ezeamaka, Daful, Anjide, Sani and Ogbole (2018) revealed that the water source for most of the respondents (80 percent) were wells and boreholes while only 3 percent had community taps as their water source. This transcended into only 14 percent of them agreeing that they washed their toilets daily.

In one of Nigeria's coastal states, Olalekan, Odubo, Omidiji, Oluwaseun and Ochayi (2018) reported that in the absence of a WASH programme, water supply in the investigated area was relatively adequate but its quality was poor and this was synonymous with unsafe excreta disposal being widely practiced alongside poor critical hand washing practice amongst residents. Subramaniam and Selvavinayagam (2018) probed the effectiveness of a WASH programme in India and reported a very significant reduction in the proportion of non-functional WASH facilities within the investigated area. He *et al.*, (2018) revealed that among Nigerian children, the lack of appropriate toilet facilities, improved safe water supply and safe disposal of their excreta was found to ensure a significantly higher probability of having cough, diarrhoea and fever.

Yaya *et al.*, (2018) verified a statistically significant relationship between quality of water supply/sanitation facilities and prevalence of diarrhoea among Nigerian children. In a study carried out in Nepal, Shrestha, Manandhar and Joshi (2018) reported that a significant disparity was found to exist between WASH settings in urban and rural areas with those in urban areas being significantly better in terms of WASH related knowledge and related facilities. Worthy of note from this result is that there was a more effectively implemented WASH programme in the investigated urban areas than those in the rural areas. Ariyo and Fasuan (2019) investigated the impact of a UNICEF WASH programme in a Nigerian state and discovered that based on the lack of regular safe water supply and availability of toilets, the respondents indicated that the incidences of water borne diseases among them was not stemmed down from its usual trend.

### **(iii) Safe Water Supply and Unsustainable Consumption/Production Patterns**

Olukanni, Ajetomobi, Tebowei, Ologun and Kayode (2014) examined access to clean water and good sanitation services in a Nigerian urban setting and revealed that the extent of water supply was such that most persons in the urban area had to rely more on commercial water supply sources and on the average, this made production more costly. Akpabio *et al.*, (2015) surveyed water and sanitation issues in terms of risk of space in a coastal Nigerian state and reported that the attitude of the locals in terms of defecating into the waters from which they sourced for their seafood was an unsustainable practice. Also, the finding from the study showed that most of the respondents indicated that they had almost no access to safe water supply.

Madona *et al.*, (2018) probed impact of a water, sanitation and hygiene intervention programme in Tanzania and observed that inclusive among the respondents' significant benefits was being made literate in line with sustainable production patterns. Woode, Dwumfour-Asare, Nyarko and Appiah-Effah (2018) verified the impact of a WASH intervention programme in rural communities in Ghana and found out that investments towards the programme's effectiveness led to a significant improvement in the consumption patterns of the locals in terms of water sources and management of water storage.

**(iv) Safe Water Supply and Unsustainable Exploitation of Natural Resources**

Shamsuzzohaa, Kormokera and Ghosh (2018) investigated extent to which consequences of unsustainable exploitation of natural resources impacted upon safe water supply among rural Bangladeshi communities and revealed that erratic heavy rainfalls, cyclones and floods usually lead to pollution of the safe water supply system.

**(v) Safe Water Supply in Cross River State**

Okorafor, Agbo, Johnson and Chiorlu (2012) found out that sources of drinking water in certain communities in Akamkpa and Calabar Metropolis were unsafe for drinking based on some bacteriological and physic-chemical tests conducted on their water samples. Ndiyo, Okon and Olumide (2013) reported that out of the 18 LGAs in the state, only three had above 50 percent access to water supply by the end of the previous year i.e., 2012, five had above 40 percent, five had above 30 percent, four had above 20 percent while the last one had below 15 percent with the northern senatorial district being the worst hit followed by central before southern senatorial district. Ukpong, Ogarekpe and Bejor (2013) revealed that the inconsistency in terms of potable water supply led to the digging of wells by inhabitants of Calabar South LGA. In each of the state's three senatorial districts – north (Obudu, Ogoja and Yala), central (Ikom, Etung and Boki) and south (Calabar Municipality, Odukpani and Akamkpa), Eni and Ojong (2014) observed that water supply was largely perceived as being unsafe for drinking and to some extent, domestic use.

In Bekwarra LGA, an assessment of drinking water quality by Odey, Segun and Ikhumen (2016) showed that it contained unappreciable amounts of heavy metals such as Lead (Pb) and Fluoride (F). Ochiche and Adie (2017) found out that in Yakurr LGA, there was no equilibrium between water demand and supply with the latter being far outweighed by the former. Okon and Njoku (2017) revealed that in certain areas within Calabar Metropolis, residents had virtually no potable water supply. Ubugha *et al.*, (2017) found out that in certain areas within Calabar Municipality LGA, water demand and supply were nearly at equilibrium. Odey, Ibor, Andem, Ettah and Chukwuka (2017) observed that in some notable Yala LGA communities, quality of drinking water was potentially hazardous as it was polluted by unappreciable doses of contaminants. In Odukpani LGA, Adie, Idris, and Udom (2018) reported that the European Union water project had ensured the availability of water supply in some communities.

In Akamkpa LGA, Eteng *et al.*, (2019) observed that drinking water in some communities was contaminated with unappreciable amounts of contaminants whose level of concentration was harmful to human health. In their study on EU counterpart projects, Odey, Agba and Edet (2019) revealed that certain communities in some LGAs in the state's southern senatorial district were beneficiaries of water projects. Iyam (2019) reported that water supply in Obudu LGA was very inconsistent in certain communities. Edim, Onoyom and Daniel (2019) discovered that in certain communities in Calabar South LGA, the available drinking water contained the following micro-organisms - *Escherichia coli*, *Enterobacter aerogenes*, *Salmonella typhi*, *Salmonella paratyphi* (B), *Salmonella typhimurium*, *Proteus vulgaris*, *Streptococcus fecalis*, *Pseudomonas aeruginosa*, *Shigella dysenteriae*, *Klebsiella oxytoca*, *Clostridium perfringens* and *Bacillus subtilis*. Similarly, Takon (2019) found out that in Etung LGA, the available drinking water for one of the most renowned communities in the area contained the micro-organisms as stated in Edim *et al.*'s (2019) study.

In Yakurr LGA, Oka, Nurudeen and Ozah (2019) found out that supply of potable water was very inconsistent. In Calabar Metropolis, Egbe, Bassey, Emmanuel, Dafe and Egu (2019) reported that the quality of potable water supply was very poor. Eteng and Anam (2019) revealed that respondents from numerous LGAs across the state's three senatorial districts (North - Ogoja, Obudu, Bekwarra and Yala; Central - Yakurr, Abi, Ikom and Etung, and; South - Biase, Odukpani, Calabar South and Bakassi) stated that potable water supply was almost non-existent in their various areas.

## **Result Presentation and Discussion of Findings**

### **Presentation of Results**

The result of the theoretical review revealed that safe water supply –

- (i) significantly reduced the adverse effects of malnutrition and food insecurity
- (ii) had a significant effect on health and environmental hazards
- (iii) significantly predicted unsustainable consumption and production patterns
- (iv) in Cross River State is very epileptic

### **Discussion of Findings**

#### **(i) Safe Water Supply and Malnutrition/Food Insecurity**

This is in line with Okonkwo *et al.*, (2011) who revealed that potable water supplied had implications for the nutritional status of the people. The finding was also in line with Adeleye *et al.*, (2014) who observed that erratic and irregular safe water supply undermined the food security of locals. In their finding, Olukanni and Okorie (2015) reported that inadequate nutrition and dieting was closely associated with inadequate water supply. Schlegelmilch *et al.*, (2016) found out that safe water supply significantly enhanced the nutritional status of people. Mwase *et al.*, (2016) reported that inadequate water supply was associated with a high prevalence of malnutrition and poor feeding.



**(ii) Safe Water Supply and Health/Environmental Hazards**

The finding is in consonance with Orimoloye *et al.*, (2015) whose finding showed that improved water supply reduced incidences of water/sanitation borne diseases. Also, Olowe *et al.*, (2016) reported that quality of drinking water sources was significantly associated with prevalence of waterborne diseases. Olalekan *et al.*, (2018) revealed that unsafe water usage was synonymous with unsafe excreta disposal and critical poor hand washing practice amongst residents. He *et al.*, (2018) observed that lack of improved safe water supply was found to ensure a significantly higher probability of having cough, diarrhoea and fever.

**(iii) Safe Water Supply and Unsustainable Consumption/Production Patterns**

The finding supports that of Olukanni *et al.*, (2014) whose finding showed that limited access to clean water/good sanitation services made production more costly. Akpabio *et al.*, (2015) reported that water and sanitation issues led to unsustainable consumption patterns. Madona *et al.*, (2018) observed that beneficiaries of a WASH programme enhanced their sustainable production patterns. Woode *et al.*, (2018) found out that investments towards a WASH programme's effectiveness significantly improved beneficiaries in terms of sustainable consumption patterns.

**(iv) Safe Water Supply in Cross River State**

The study's finding agrees with that of Ndiyo *et al.*, (2013) who reported that out of the state's 18 LGAs, only 3 had above 50 percent access to safe water supply as at the time of their investigation. In each of the state's three senatorial districts, Eni and Ojong (2014) observed that water supply was mostly unsafe for drinking and domestic use. In northern Cross River, an assessment of drinking water quality by Odey *et al.*, (2016) showed that it contained unappreciable amounts of harmful heavy metals. Okon and Njoku (2017) observed that in most areas in the state's capital, residents had virtually no potable water supply. In the southern part of the state, Eteng *et al.*, (2019) observed that drinking water in most communities was contaminated with unappreciable amounts of harmful contaminants. Iyam (2019) also reported that water supply in northern Cross River was very epileptic in most communities. Edim *et al.*, Onoyom and Daniel (2019) discovered that the available drinking water in most areas of the state's capital contained a wide range of harmful micro-organisms. Similarly, Takon (2019) found out that central Cross River, the available drinking water for some renowned communities contained the micro-organisms as reported in Edim *et al.*'s (2019) study. Lastly, Eteng and Anam (2019) revealed that numerous respondents across the state's three senatorial districts indicated that potable water supply was non-existent in their various localities.

**Conclusion**

The theoretical approach to examining whether safe water supply can serve as a strategy for enhancing wash-related practices towards sustainable, healthy and resilient communities in Cross River State has shown the trend of research reports. Though they sound ominous but the reality is that without regular and sufficient safe water supply in the state, communities would most likely find themselves prone mainly to increasing vulnerabilities of each of malnutrition and food insecurity; health and environmental



hazards, and; unsustainable consumption and production patterns. It is worthwhile stating here that the consequences of increasing vulnerabilities to such issues may not put the state in the right path towards sustainable development.

### Recommendations

Based on the findings, the following recommendations are suggested;

1. Both rural and urban public water supply agencies need to be mobilised and made aware of the roles they can play towards addressing malnutrition/food insecurity related-issues
2. Water/sanitation and hygiene programmes in the state need to be encouraged to further enhance the reduction of peoples' behaviours that expose them to health and environmental hazards
3. Need to facilitate sustainable consumption and production patterns should spur both governmental and non-governmental water/sanitation and hygiene related agencies to make their actions more effective
4. The consequences of unsafe water supply should make the state government to seek for more assistance to enable it address the issue of epileptic water supply

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