

Full Length Research Paper

Water, Sanitation and Hygiene (WASH) in Community Disease Control in Cross River State, Nigeria

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Abstract

This study was designed to examine how water, sanitation and hygiene (WASH) programs could be used for community diseases control, specifically; this study is initiated to examine the relationship between water, sanitation and hygiene (WASH) behavior/practices and the incidence of WASH related health complications in Boki Local Government Area of Cross River State, Nigeria. Two research questions were asked as to how the sampled population perceived their WASH behavior/practices and how can WASH principles help to reduce the incidence of WASH related health complications in the study area, a null hypothesis of no relationship between water, sanitation and hygiene (WASH) behaviors/ practices and the incidence of water and sanitation related health complications in the health status of the studied population was formulated to guide the study. Using stage-wise sampling technique, a sample of 638 respondents were sampled from among farmers, traders, artisans, civil servants, CBO/NGO/CSO staff and others. Four instruments were used for data collection, focus group discussion, key informant interview, transect walk and structured questionnaire. Simple percentage and Spearman rho correlation analysis was used for analyzing data generated from the field. The result of the analysis shows that the people have a negative perception of the WASH behavior and practices and its health implication. The Spearman rho correlation analysis shows a correlation value of 0.91 at a 0.05 significance level under 637 degree of freedom. The result shows a very positive correlation between WASH behavior/practices and incidence of WASH related health complications among the studied population. The implication therefore is that negative or poor WASH behaviors/practice increases the incidences of WASH related health complications while positive WASH behaviors/practices reduces WASH related health complications in the rural areas under study. It is recommended that community members should carry out self help construction of improved pit latrine through the use of locally available materials, and awareness creation should further be carried out to create the needed awareness on WASH principles.

Keywords: Water, sanitation and hygiene, Hygiene behavior, WASH related health complications, Community self- help projects and improved Pit latrine.

INTRODUCTION

Human existence on the planet earth is bedeviled with a lot of health related problems caused by man's living environmental conditions. These are the surrounding conditions of man's living environment which have been

observed by researchers to be consequentially detrimental to the health, social and economic well being of the individual and his family or society where they live, (Rabie and Curtis, 2006; Hamlin, 2009; Falco and Smith,

2010). Man's health is determined by some factors which play a leading role in making man what he is, these conditions are social, economic, political, natural, man-made and environmental factors. Human healthy living is tied to some situations where man finds himself, For instance, the environment man lives, their access and availability to quality drinking water, transportation and storage of this water for family consumption, their hygiene and sanitation level, their surrounding environment including their waste disposal and management, feeding habit and personal hygiene among others, To a large extent determine the extent of one's health.

WHO/UNICEF Joint Monitoring Program estimates for Water Supply and Sanitation released in early 2013 shows that 36 per cent of the world's population- 2.5 billion people lack access to improved sanitation facilities, and 768 million people still use unsafe drinking water sources. Inadequate access to safe water and sanitation services, coupled with poor hygiene practices, kills and sickens thousands of children every day, and leads to impoverishment and diminished opportunities for thousands more; (Lori, 2013). Hamlin (2009), discovered a common chain running round the discussion parlance when looking at the cases of malaria, cholera dysentery and Dengue fever. The author therefore posited that one common theme is that the areas that are most prone to epidemics are areas of the world that are home to some of the world's poorest people. In order to control these and other infectious diseases, it is imperative that people in these regions have access to clean, safe drinking water and improved sanitation and hygiene. Building wells and latrines before a disaster or an epidemic strikes would provide the basic human rights these citizens need to protect themselves against three of the world's most dangerous diseases

According to Sergio, (2007) cited in UNICEF, (2013) statistics, drinking-water coverage in 2011 remains at 89%, which is 1% above the Millennium Development Goals (MDG) drinking-water target. It was reported that in 2011, 768 million people depended on drinking-water from unimproved sources, while sanitation coverage in 2011 is 64%. Meeting the MDG sanitation target of 75% seems a mirage if current trends are not checked. It was also reported that by the end of 2011, there were 2.5 billion people who do not have access to improved sanitation facilities. The number of people practicing open defecation decreased to a little over 1 billion, but this still represents 15% of the global population, (Lori, 2013).

Globally it has been recognized that one of the most important recent milestones has been the recognition in July 2010 by the United Nations General Assembly of the human rights to quality water and sanitation. The

assembly recognized the right of every human being to have access to sufficient water for personal and domestic uses (between 50 and 100 liters of water per person per day), which must be safe, acceptable and affordable (water costs should not exceed 3 per cent of household income), and physically accessible (the water source has to be within 1,000 meters, from the home and collection time should not exceed 30 minutes).

There has been the clamor from the rural communities that their health related challenges are caused more often by the unavailability of quality and potable drinking water, but scholars have begun to see a paradigm shift in this thesis, where the rural populace see the major causes of their health related problem to be water, but not considering their sanitation and personal hygiene level as their major problem. Based on this perception, one will pause to ask some fundamental questions:

- i. Is the problem of the rural communities their lack of access and availability to quality and potable drinking water?
- ii. Does the attitude of the rural communities in terms of personal hygiene and sanitation as well as feeding habit influence their health status?
- iii. What role can Water, Sanitation and Hygiene programs (WASH) play in eradicating or reducing the incidence of these water related diseases in the rural communities?

The Water, Sanitation and Hygiene (WASH) program

WASH: this is shortened form for Water, Sanitation and Hygiene, WASH as it is generally called means the programs of community development coined by UNICEF for combating community related disease situation beginning from water, sanitation and hygiene related problems and how these contribute to community related diseases like diarrhea, typhoid fever, cholera, river blindness, guinea worm among others. UNICEF's overall objective in the water and sanitation sector is to promote the survival, protection and development of children, and to promote behavioral changes essential to realizing the full benefits of water and sanitation services. This program came into being when it was realized that most community problems are not because these diseases exist in the rural communities but because their habit and attitude are more responsible for these epidemics that usually besiege the rural community. This is so because the habit and attitude of most rural dwellers even with some urban dwellers has become worrisome in recent times. The major objectives of UNICEF WASH program include:

Objective: The overall objective of UNICEF in the

area of water, sanitation and hygiene (WASH) is to contribute to the realization of children's rights to survival and development through promotion of the sector and support to national programs that increase equitable and sustainable access to, and use of safe water and basic sanitation services and promote improved personal hygiene.

Measurable targets

Target 1: Halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation (MDG Target 10)

Target 2: Ensure that all schools have adequate child-friendly water and sanitation facilities, and hygiene education programs.

However UN report, 2013 shows that about 11 per cent of the global population (783 million) people are still without access to quality potable drinking water, and at the current rate, more than 605 million people especially in the developing and third world countries (sub-Saharan Africa inclusive) will still lack coverage in 2015. The report also observed that four out of nine developing countries, about 90 per cent or more of the population are still using unimproved water and sanitation facilities; the coverage is still very low in Oceania and sub-Saharan Africa, neither of which is on track to meet the MDG drinking water and sanitation target by 2015. The report was emphatic to mention that over 40 per cent of all people without improved drinking water and sanitation live in sub-Saharan Africa (Nigeria inclusive), while coverage with improved drinking water sources for most rural populations is still lagging behind (Lori, 2013).

Poor sanitation, water and hygiene have many other serious repercussions. Children, particularly girls are denied their right to education because their schools lack private and decent sanitation facilities. Women are forced to spend large parts of their day fetching water. Poor farmers and wage earners are less productive due to illness, health systems are overwhelmed and national economies suffer. Without WASH (water, sanitation and hygiene), sustainable development is impossible.

According to Curtis and Cairncross, (2003) rural community's access to improved water and sanitation facilities does not, on its own, necessarily contribute to improved healthy living of the rural populace, because there now exist very clear evidence linking the relationship between water, sanitation and hygiene behavior and human health, this interrelationship exist most especially in terms of human hand washing before cooking, eating, after defecating and in most critical situation with soap (Sergo, 2007).

Emanating from the postulation of Curtis and

Cairncross, (2003), Luby et al. (2005) found out that hand - washing with soap can significantly reduce the incidence of diarrhea and cholera, which is seen in tropical countries as the second leading causes of maternal and child death amongst children under five years of age. A recent study by Rabie, and Curtis, (2006) suggested that regular washing of hands with soap at critical times can reduce the number of diarrhea and cholera cases by almost 50 per cent. In the same study Rabie and Curtis (2006), further found out that consistent washing of hands at critical times also reduces the incidence of other diseases like dysentery, river blindness, typhoid, pneumonia, trachoma, scabies, skin and eye infections. This study further observed that the inculcation of the attitude of hand-washing with soap is also a fundamental prerequisite for the control of the spread of bird flu (Avian Influenza).

Sanitation has a share of its problem to human health, it is observed that dirty and unhealthy environment contribute to human health problems in Africa and most part of the world. Researches have shown that most illnesses and other health related ailments caused by germs and worms in faeces are a constant source of discomfort for millions of people. These illnesses can cause many years of sickness and can lead to other health problems such as dehydration, anemia, and malnutrition. Severe sanitation-related illnesses like cholera can spread rapidly, bringing sudden death to many people (Rabie and Curtis, 2006; Barclay, 2008; Chandra et al., 2010 and Lori, 2013).

Scholars in the field of epidemiology, dermatology, environmental health and sanitation have observed that hazards can present themselves to humans in various media e.g. air, water, food, land etc (Cairncross et al., 2010). The influence they can exert on our health is very complex and may be modulated by our genetic composition, psychological factors and by our perceptions of the risks that they present. Human health conditions can come with general environmental health hazards, extremes of climate, occupational hazards and hazards associated with food poisoning, (most accidental) or sexually transmitted disease (Cairncross et al., 2010; Chandra et al., 2010). Cairncross et al., (2010) observed that health effects from economic and social consequences of environmental change are also considered here, there exist an association between an exposure to water, sanitation and hygiene related problems and adverse health effects, but these do not, on their own, prove that the former is the cause of the latter. Many other non-causal associations could explain the findings (Cairncross et al., 2010).

The fundamental idea of canvassing to increase the practice of washing hands at critical times with soap is for the promotion of behavioral change through

incentives, motivation, information sharing through awareness creation and education. Studies have shown that there are a variety of ways to achieve this through high-profile national media campaigns, peer-to-peer education techniques, hygiene lessons for children in schools and the encouragement of children to demonstrate good hygiene to their families and communities (Fewtrell, 2005). Falco and Smith, (2010) however observed that it is mandatory to state that without water, there is no hygiene, and researches have further shown that the less readily available water is, the less likely that good hygiene will be practiced in any households (Cairncross et al., 2010).

Chandra et al. (2010) in their study observed that the incidence of malaria, cholera, diarrhea and dysentery has increased in recent times due to the habit/attitudes of the rural communities. The authors further observed that even in urban centers and most rural slums, when population growth outpaces the existing infrastructure, wastewater treatment systems are unable to cope with the influx, garbage and sanitation facilities cannot contain the increased waste and refuse generated, and access to clean, treated drinking water may not be available. All of these conditions contribute to the possibility of excess water pooling, which creates the perfect environment for disease causing mosquitoes to breed (Sergo, 2007). In most rural communities and some urban centers, when drinking water is unavailable like either wells or through a home tap, it must be carried a long distance and stored near the home. Uncovered containers of stored drinking water are also the perfect habitat for breeding mosquitoes. Barclay, (2008) however was of the opinion that malaria, a disease caused by parasites that enter the blood through the bite of a mosquito; causes fever, anemia, and can lead to severe complications and even death. Malaria is being found more frequently in areas where it was never prevalent before. Malaria has been discovered as one of the most prevalent killer diseases in the tropics (Falco and Smith 2010; Chandra et al., 2010).

Falco and Smith (2010), further observed that for both water and sanitation, there is a continuous major disparity among regions; sanitation coverage is lowest in sub-Saharan Africa, Oceania and South Asia, where 70%, 64% and 59% of people do not have access to improved sanitation respectively, while for water, coverage is only 56% in Oceania and 63% in sub-Saharan Africa, but all other regions have coverage rates of 86% or higher (Jones and Reed 2005; WHO/UNICEF JMP, 2010). Other disparities also continue, poor people and people's living in rural areas are far less likely to have access to improved water and sanitation facilities than their richer and urban counterparts (WELL, 2004).

Attitudes are a set of lifestyle and belief system practiced or carried out by people who decide to adopt such lifestyle or belief system in their daily lives. The Random House Webster College Dictionary (2007) defined attitude as a way of life, action and belief seen to be practiced in everyday life by those who become committed to it. There has been some attitude and behavioral pattern practiced by the rural communities which are seen as been environmentally unhealthy in terms of human health, these practices are detrimental and is socially and economically unproductive. These is believed to have impacted very negatively on the health of most individuals in the rural communities, a highlight of some of these activities could throw more light on the topic under discourse:

- In most rural communities especially in Africa, the kinship family ties are widely carried out, these goes a long way to determine how a family member is seen and should be treated within the family. Most community member's belief on the communal system, where everything in the community belongs to all and should be shared by all, and this method of kinship behavior has also influenced their way of live. In view of the above, let us highlight some communal lifestyle practiced within the communities under study.

- In a compound, a pot of drinking water or a keg is kept centrally with a cup for everybody to drink from using the same cup, whether you are a stranger or a member of the family, the same cup is used, whether the person is a carrier of tuberculosis or whooping cough or other communicable diseases, nobody gives a hoots to that fact. The same is done in the community gathering, where may be one or two cups are used for pouring wine for everybody who cares to drink in any community meeting, same is done for a small glass for those who drink illicit gin.

- In terms of fetching water from the stream or distant well, taps or boreholes, most women use basin without a cover, they transport such water through a long distance, in some cases, some women even put leaves to prevent the water from pouring, the same water might be stored in an open container without cover for consumption.

- Most rural communities fetch water for cooking and washing from rivers and streams, the same community members wash directly in the streams and rivers and even defecate inside while some drink directly from such water.

- In most communities, domestic animals are allowed to stray and they drink directly from the same sources of drinking water with humans.

- In most compounds, once they finish eating their meals, plates and cooking pots are left thrown all over, goats, pigs, dogs and even chicken feed too freely from the left over that are not covered, it's only when they

want to cook again or eat again that they remember to wash and cook their food with such utensils.

➤ In most communities like in Boki, Etung, Odukpani, Akpabuyo, Ikom, Obanliku, their toilet system is the open pit latrine system, where they pin two fork sticks into the ground, cross it with another and squat on top of the stick to defecate (okwukwa), no hole is dug, and in places where they have pit latrines, they do not cover them, no vent hole is provided for. While in the okwukwa system, the feces is dropped just outside, chicken, dogs, pigs, goats, cow etc can just freely walk into the dumps of excreta and carry them into the compounds or flies can perch there and transfer them directly to our meals. In the afore mentioned communities, the people live in an undulating environment, where they build their houses on hill tops, while the sources of their water is just behind their houses, below the valleys, when run offs and rains come, the feces is washed straight into the drinking water sources.

➤ Most community members hardly bath twice a day and they wear one particular clothes for well over three to four days even when they sweat on such clothes, some hardly brush their teeth or shave their armpit and pubic hairs, while most still carry lice in their head.

➤ Most young girls in the rural communities still use tissue as pad during their menstrual periods, others use clothes which they just wash but do not iron or press with heated iron to kill the germs that might get stuck there.

➤ Most communities still practice the open defecation, and in most places, they use unimproved pit latrines, these latrines generate heat which ordinarily should pass out through a vent pipe, but because they do not have vent pipes, it passes out directly through the drop holes; these heat is not good for the anus and women reproductive openings.

➤ During cooking, most women have children, these children defecate within the periods their mothers are cooking, and such mothers will just carry the children, use either sticks or papers and clean their children mess and go back cooking without washing their hands properly with water and soap.

➤ In the field, people just eat fruits without washing the fruits and their hands before eating such fruits, and flies must have perched on excreta dropped in the open and came back to perch too on such fruits.

➤ Mature people go to these open toilets, use papers, maize cobs or sticks for cleansing their anus, they do not wash their hands with soap, some just go like that and eat, while others will hurriedly wash their hands and begin to eat.

➤ In most compounds, waste dumps are just done directly behind the houses, while others are done into streams and rivers, animal and children feces are just

littered all over the places.

➤ During cooking, most women use the ladle they use in cooking and scooping their food to test how sweet or properly cooked by testing the ladle from their tongue, the same ladle is used to serve people.

These and many more other practices have taken place in most rural communities and these have become part of their lives, these are already built attitude and behavior which they have practiced over times, and these systems are detrimental to human health and these have been seen by researchers, environmental health officers and other epidemiologist to have been the causes of some of the rural diseases in our country today.

The purport of the nexus of the 6F of water, sanitation and hygiene depicts the interrelationship existing between feces, flies, field, fruits, fluid and food and its attendant impacts on human health and wellbeing, this is as shown in (Figure 1).

METHODOLOGY

Data analysis

This research adopted both qualitative and quantitative research design where survey inferential techniques was used for the study, the choice of survey inferential technique is to allow the use of a representative fraction of the entire population to be used to make valid generalization from the findings of the study. A total of six hundred and thirty eight respondents were randomly selected using stage-wise random sampling technique from ten communities used for the study. The research subjects were drawn from amongst farmers, traders, artisans, students, community development organizations, community WASHCOM members and some NGOs/CBOs within the communities under study. The communities sampled for the study include Arangha, Nsadop, Nkak, Bansan Osokom, Onitsha farm, Buje, Bansan Isobendeghe, Kachwan Iruan, Bunyia Eruan and Kwagom all in Boki local government areas of Cross River State, Nigeria. The instruments for data collection include, key informant interview, focus group discussion, participatory observation, transect walk and a structured questionnaire. Spearman correlation analysis and simple percentage was used for data analysis.

Two research questions were asked:

- What is the perception of rural communities towards their water, sanitation and hygiene attitude?
- To what extent can the promotion of WASH program reduce the incidences of water, sanitation and hygiene

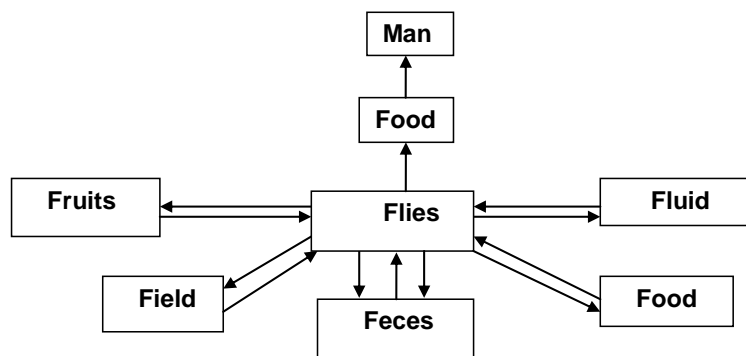


Figure 1. The Six Fs of Water, sanitation and hygiene,
Source: *Fieldwork*, 2015

related health complications in the rural communities of Cross River State?

To answer these questions, a null research hypothesis was formulated thus: there is no significant relationship between water, sanitation and hygiene (WASH) behaviors/ practices and the incidence of water and sanitation related health complications health status of the studied population.

RESULTS AND DISCUSSION

To answer the question of the perception of the rural communities on water, sanitation and hygiene behavior and practices, the rural communities seem not to have positive idea about their behavior, to the population under study, during the focus group discussion and interview, 69% of the respondents (441) saw nothing wrong with their behavior and practices in terms of their water collection, storage and usage, 21% of the respondents (134) observed that after the lectures and the WASH awareness campaign, they have realized that their WASH behavior and practices has created serious health problems for them, which are unknown to them. 63 respondents, (10%) said they were aware of the dangers of these practices, but they carry out these practices because it has been a long held tradition and there were no visible alternative, hence their participation in these negative WASH practices.

In answering the second question of the extent the promotion of WASH program could reduce the incidences of water, sanitation and hygiene related health complications in the rural communities of Cross River State, the null hypothesis of no relationship between water, sanitation and hygiene (WASH) behaviors/ practices and the incidence of water and sanitation related health complications in the health status of the studied population. This hypothesis was

test at 0.05 significance level, the result is as shown on table 1.

The result of the analysis shown on table 1 indicates that the calculated correlation value of .091 at .05 significant levels, with a degree of freedom of 637 shows that there is a significant correlation between WASH behaviors/practices and incidence of WASH related health complications among the studied population. The implication of this analysis means that WASH behaviors and practices has a significant relationship with health incidence like malaria, diarrhea, cholera, typhoid, river blindness, ascaris, bilhaziasis and other health related incidences, by implication, it means the extent to which WASH behavior is practiced and carried out in the rural communities contribute to either reduce or increase the rate of sanitation, water and hygiene related health diseases and other complications. This means that as people go about their daily lives in the rural communities, they should be able to observe and practice a well informed level of sanitation, hygiene and proper use of quality water beginning from harvesting, transportation, storage and usage. Sanitation in this perspective has to do with the proper maintenance of clean and green environment, proper disposal of fecal waste, food remains, household garbage, animals dung among others, maintaining quality hygiene on the other hand involves the personal cleanliness of individuals and their way of life, shaving and barbing of human hairs especially the hairs on the head, pubic region and armpits, cutting/shaving of nails, brushing of one's mouth, washing of hands at critical points, using of different cups for drinking either wine or water at home and in public places, washing of plates after eating, washing of fruits and other edibles before consuming them etc. It has been said that most community diseases are caused by dirty and unclean community sanitation attitudes by community members. Diseases like cholera, diarrhea, dysentery, river blindness, guinea worm,

Table 1. Correlations between WASH and WASH health related complications

			Water, sanitation and hygiene behavior and practices	Incidences of WASH related health complications
Spearman's rho	Water, sanitation and hygiene behavior/ practices	Correlation	1.000	.091(*)
		Coefficient		.022
		Sig. (2-tailed)		.637
	Incidences of WASH related health complications	Correlation	.091(*)	1.000
		Coefficient		.022
		Sig. (2-tailed)		.637
		N	637	638

* Correlation is significant at the 0.05 level (2-tailed)

onchocerciasis amongst others are caused by the extent of sanitation, hygiene and the quality and attitude of the rural communities among others. The result also shows that the extent of awareness on the WASH principles is still very low as they still hold on to their traditional methods of water, sanitation and hygiene behavior which were handed over to them by their ancestors. This disposition by the communities' shows that with proper awareness, the rural community's could take urgent active steps to change their behavior, hence they are willing to change these practices since they have been sufficiently informed about the negative effects of their actions in their communities.

The rural communities perceive their sanitation practice as the best suited for their situation since they practice communal life style where everything within the community is shared freely amongst community members; they see their action as supporting this life style. The communal life style is a means through which they collectively share almost everything within the communities, be it wine, food, water, clothing's etc, they believe in living a communal life, where everybody can eat, drink and even sleep in anybody's house. To the rural communities' living, eating and sharing of food, wine and water is a sign of unity and togetherness. This implies benevolence and generosity, to them, the idea of insisting on using improved toilet or pit latrines for defecating is like a punishment since most community members are used to defecating in the bush or into streams or rivers. Compelling them to use a pit toilet or improve pit latrine is a punishment. 79% (504) of the respondents used for the study are of the view that from prehistoric times, their ancestors and their forefathers defecated in the bush and rivers and never had any of these diseases we are talking about, so why should they be afraid.

During the sanitation practice inventory, 96% (612) of the population ticked for open defecation, their reasons being that it is easy, accessible and does not

have any strings attached since both domestic and wild animals could easily prey on the excreta and same could disappear within a very short time, it was better and acceptable. They practice open defecation using "okwukwa", "dig and bury" (or cat style), "bush attack", "the sailor's style" (dropping from the canoe) etc. The hygiene practice inventory also showed that about 97% (619) of the respondents use one cup placed centrally on drinking pot and also in the public place for water, wine or other drinks in the community. In terms of transporting, storage and use of water, 94% (600) of the respondents use open basin and buckets for fetching, even in rain water harvesting, they also use open containers for harvesting rain water. In all, there is no boiling and filtration of any water for drinking whether from the stream, rivers or rain water.

For the hygiene habit, most people are only interested in shaving their chin, the idea of shaving pubic and armpit hair is strange and non African. 96% of the respondents (612) observed that they are shy and cannot invite a friend or spouse to help them shave, 4% (26) said they had tried it once, but during the re-growth of the hair, they observed some discomfort as the hair follicle itches them. Other also observed that they develop bumps from shaving, so they had stopped shaving and they don't have bumps again. It was also observed that the community under study is a rural farming communities, and they engage in farming activities, so taking one's bath after the morning session farm and then going back to the farm in the evening, will mean bathing twice and both the time, the cost on soap and other toiletries will deplete their mean resources.

It was observed that most women in the study group revealed they either use toilet roll (tissue papers) or old clothing's during their monthly menstrual periods, but do not heat them after washing to kill any germ that may have hidden in it. Those who opted for tissue used it because they can afford to buy them and felt it was safer for them to use pads that are hygienically treated. In our

return inventory, more than 45% (287) respondents now use modern hygienic pads, whereas 52% (332) respondents, who cannot afford pad, now heat their old clothing pads with hot water, sun dry and then reused.

It is in line with this finding that Jones and Reed, (2005) posited that safe disposal of human excreta creates the first barrier to excreta-related disease, this barrier so created helps to reduce disease transmission through direct and indirect routes contact with human and animal excreta. It was on this basis that Barclay, (2008) found out that safe excreta disposal is therefore a major priority and in most disaster situations should be addressed with as much speed and effort as the provision of a safe water supply. The provision of appropriate facilities for defecation is one of a number of emergency responses essential for people's dignity, safety, health and well-being. Hygiene promotion is a planned, systematic approach to enable people to take action to prevent and/or mitigate water, sanitation and hygiene-related diseases. It can also provide a practical way to facilitate community participation, accountability and monitoring in WASH programs. Hygiene promotion should aim to draw on the affected population's knowledge, practices and resources, as well as on the current WASH evidence base to determine how public health can best be protected.

CONCLUSION

In conclusion therefore, the aim of any WASH program is to promote sustainable personal and environmental hygiene in order to protect health. It is therefore imminent to state that an effective WASH program relies on an exchange of information between the external facilitators and rural communities in order to identify key water, sanitation and hygiene problems and with a view to finding culturally appropriate solutions where the community members are at the forefront of these activities. Ensuring the optimal use of all water supply and sanitation facilities and practicing safe hygiene will result in the greatest impact on public health. It is however observed that water is essential commodity for human existence, health and human dignity, but in extreme conditions or situations, where there is short supply of water available to meet basic needs and in these cases supplying a survival level of safe drinking water is of critical importance. In doing these, care and safety should be used, where covered containers should be used to harvest, transport and store safe drinking water. This is because in most cases, the main health problems are caused by poor hygiene due to insufficient water and by the consumption of contaminated water. Once this is done, human health

will be drastically improved and the incidence of WASH related health complications can be completely eradicated or reduced to the barest minimum.

RECOMMENDATIONS

From the foregoing, the following recommendations are made:

- ❖ There should be mass community awareness creation on water, sanitation and hygiene programs in all rural communities especially in Boki local government area
- ❖ Communities should form community self-help groups and construct improved pit latrine for defecation using local materials within the rural setting for their waste management
- ❖ Streams should be fenced round, while during the collection, harvesting, transportation and storage of water, this should done in covered containers
- ❖ Households should be encouraged to provide more drinking cups for their household; so that each member has a drinking cup to him/her self and spare cups should also be made available for visitors. There should a separation of drinking cups from the main one on the water point.
- ❖ Community members should adopt regular shaving of pubic, armpits and hair to allow free air to touch their sensitive region reducing sweating and odor
- ❖ People who are menstruating should use the recommended World Health Organization pad or use old clothing's as pad during their menstrual period, this should be washed regularly with hot water, ironed and then re-used.
- ❖ Waste from refuse and other household garbage should be properly disposed away from the compounds and should be burnt where need be.
- ❖ Plates and other cooking utensils should be properly washed and hung up where animals cannot reach such cooking and eating utensils.
- ❖ Domestic animals should properly be accommodated and confined to their pen to avoid roaming around freely in the rural settings
- ❖ Hand washing at critical periods should be embraced, after defecation, after farm work, when they want to eat and when they touch children's excreta or menstrual materials.
- ❖ Regular washing of clothes should be promoted among the rural settings
- ❖ Regular bathing and brushing of teethes should be encouraged in the rural communities.
- ❖ Pathways within the communities, to the stream, community play ground, compounds, market square, schools etc should be cleared regular by the youths in

the communities.

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