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Beach or Bush? A study on sanitation and clean water in Ushongo Village

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Beach or Bush?
A study on sanitation and clean water in Ushongo Village

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Abstract

The purpose of this study was to examine the issues with sanitation and clean water in Ushongo Mtoni Village and then use these findings to determine whether Ushongo Mtoni meets the 2014 World Health Organizations target goals for sanitation and clean water: eliminate open defecation; achieve universal access to basic drinking water, sanitation and hygiene for households. This study was conducted in Ushongo Mtoni, Tanzania, between the dates of November 10th to 24th 2014. Interviews were conducted using non-random sampling through formal and non-formal interviews with participants chosen by my translator, Shaban. Sample frame was the villagers of Ushongo Mtoni, and sample population was 1) the mamas and babas (Heads of Household); 2) 4 members of the Village Government including the village chairman, development officer, and environmental officer; and 3) a health care doctor. My total sample population was 85 individuals: 65 individuals and 20 individuals within focal groups. My findings revealed that the village environment was not clean, lacked enough toilets, and the villagers did not have access to clean water. The village has not met the WHO target goals: eliminate open defecation; achieve universal access to basic drinking water, and sanitation and hygiene for households.
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Introduction

Upon my arrival in Tanzania, I was amazed at all the sights around me; beautiful acacia woodland, stunning grasslands, and an abundance of landscapes so foreign to the American mind. However, I had yet to see the human component of my environment. After living in Bangata, Maasai homestay, and seeing the village of Ushongo during ISP preparation week, I began to see how humans interact with their environment. The most shocking and interesting example was in the village of Ushongo.

Approximately 60 kilometers south of the city of Tanga, Ushongo sits between the Indian Ocean and the Pangani River. This rural fishing village of only about 450 residents is challenging to reach, as there is only a single road from Pangani to Ushongo and its conditions are poor. Upon arrival, I noticed how underdeveloped this village was, unlike any we had seen or lived in previously with SIT. My initial observations were that the majority of the buildings were constructed from sticks and woven coconut grasses, there was trash as far as the eye could see, and murky puddles of water dotted the ground; the environment, in general, looked “dirty” or unsanitary. One of the first nights our group was eating dinner from a mama who owned a small restaurant. When I asked to use the bathroom, she took me inside her house and pointed to the corner of the one room house. Inside that area, the cooking stove was about 1 meter away from the “bathroom.” I thought to myself, this cannot be sanitary, and if people defecate here, do they bury it, or do they go somewhere else? This experience and my initial observations led to an assortment of questions about the sanitation and clean water in this village: questions for which I wanted answers.

Sanitation is the hygienic means of promoting health through prevention of human contact with hazards of wastes as well as the treatment and proper disposal of
wastewater. Disposal of urine and feces, wastewater, and trash, and access to drinking water are all factors of sanitation; adequate sanitation in conjunction with safe water is essential for good health, welfare, and livelihoods (Progress 2013). In simplest terms, sanitation is a clean environment. According to the World Health Organization, inadequate sanitation is a major cause of disease worldwide and improving sanitation is known to have significant beneficial impacts on health at both the household and community levels (2014).

Despite increases in sanitation coverage, progress has been slow. In Tanzania less than half of the population had access to improved sanitation facility as of 2012. Globally, 2.5 billion people do not have access to improved sanitation facilities and of these, one billion people still practice open defecation (WHO 2014). Open defecation perpetuates the vicious cycle of disease and poverty and is an affront to personal dignity. A gram of feces can contain 10 million viruses, 1 million bacteria, 1000 parasites, and 100 worm eggs (George 2008). This small amount of fecal matter can contaminate water, food, cutlery, and shoes, and be ingested, drunk, or eaten. The most recent WHO report on sanitation has found that those countries where open defecation is most widely practiced have the highest incidence of deaths of children under the age of five, as well as high levels of under nutrition (WHO 2014). Additionally, “there are also strong gender impacts: lack of safe, private toilets make women and girls vulnerable to violence and is an impediment to girls’ education” (WHO 2014). The WHO report found that those without an education are also more likely to defecate in the open: “the percentage practicing open defecation appears to decline with increasing levels of education” (WHO 2014). Those one billion people with no sanitation facility whatsoever continue to defecate in gutters, behind bushes or in open water bodies, with no dignity or privacy. Nine out of ten people who practice open defecation live
in rural areas (George 2008). This is relevant as Ushongo Mtoni is a rural area. Furthermore, inadequate waste management is related to poor sanitation as “millions of people are exposed to dangerous levels of biological contaminants and chemical pollutants in their drinking water due to inadequate management of wastewater” (Progress 2013). Furthermore, data from WHO has found that up to 90% of wastewater in developing countries is discharged untreated directly into rivers, lakes, and ocean (2014).

A call for safe drinking water, another factor that is essential for health, welfare and livelihoods, is also greatly needed. Worldwide, 784 million people still did not have access to improved drinking water in 2012, 325 million (43%) of whom live in sub-Saharan Africa. Indeed, the lowest levels of safe drinking water coverage are in this region; in Tanzania only 50-70% of the population uses improved drinking water sources as of 2012 (WHO 2014). Furthermore, contaminated water serves as a mechanism to transmit communicable diseases such as diarrhea, cholera, dysentery, typhoid and guinea worm infection (Progress 2013).

Not surprisingly since these facts and figures are alarming, the WHO has created target goals for water and sanitation that build on the Millennium Development Goals to eliminate these disparities. The vision is universal access to safe drinking water, sanitation and hygiene. The target: eliminate open defecation; achieve universal access to basic drinking water, sanitation and hygiene for households, schools and health care facilities; halve the proportion of the population without access at home to safely managed drinking water and sanitation services; and progressively eliminate inequalities in access. (WHO PDWS, 2014).

After reading these goals, facts, and figures, I became passionate about these issues and agreed that no one should lack safe water and a hygienic toilet. This led, rather quickly,
to my ISP topic: the sanitation and access to clean water. The study seeks to answer the following questions: what are the sanitation and water problems faced by the village of Ushongo? And how and to what extent is the village of Ushongo achieving the target goals of the WHO? I had no predictions, but after understanding the problems with poor sanitation and lack of safe drinking water, I decided I wanted to examine the whole picture through an investigation of the facilities and people’s perspectives in the rural village of Ushongo.
Study Site

At the northernmost part of Tanzania’s 800 kilometers of coastline lies the region of Tanga. Stretching 180 kilometers south from the Kenya-Tanzania border and lining the Indian Ocean, the habitats of Tanga are very diverse, ranging from coastal beaches to wooded mangroves to crop land to developed cities and towns.

Approximately 60 kilometers south of the city of Tanga is Ushongo village (Figure 1). Ushongo village is under the jurisdiction of the Tanga region and Pangani District, and is situated 15km south Pangani town by road (Shaban pers. comm 2014). The village is surrounded by lodges and guest houses for tourists. The village is home to approximately 700 residents, 450 of whom live in Ushongo Mtoni, the central village (Shaban pers. comm. 2014), and the rest of whom live in Ushongo Mabaoni, located approximately a kilometer and a half south (Figure 1). The government officials lived in Ushongo Mtoni, not Mabaoni, although they were responsible for both Ushongo Villages. Most residents of Ushongo Mtoni, due to the proximity to both the ocean and the river, rely on the fishing industry as their primary source of income (Shaban pers. comm 2014). I have drawn my own map (Figure 3), showing some of the main features of the village relevant to my study: areas of high-density trash, wells, government buildings, government toilets, bush, and houses. This small, mainly Muslim village sits directly along the beach, is rather undeveloped and has poorly developed infrastructure, with the majority of buildings constructed from small branches, sand, and woven coconut grasses (Figures 2 and 3). As the village is located far from any market or big city, purchasing products in the village is limited. However, there are two dukas which provide water, rice, flour, etc, and occasionally fresh fruit and vegetables (Figure 3). When the tide is high, houses along the beach are a mere 3 meters
from the ocean. Throughout the village trash and dirty water can be seen everywhere, but centered in certain places. The main landmarks include: one government official building, a small library, and a mosque. Although fishing is the main source of income, Ushongo also has a substantial tourist industry with a few lodges lined up along the beach.

In order to reach my other study site, the Health Center, to interview the doctor, I went to the village of Mwera. Mwera is about 6 kilometers inland from Ushongo (Figure 1). It is the closest health center as well as nearest dispensary for the villagers of Ushongo.
Figure 1: Map of the Region: Ushongo Mtoni in relation to Mwera, Pangani, and Tanga

Figure 2: Map of Ushongo Mtoni. Source: Google earth
Figure 3: Drawn Map of Ushongo Mtoni Village

Key:

- Toilet
- Well
- Village house
- High-density areas of trash
Methodology

This study took place between November 10th and November 24th, 2014, in the village of Ushongo Mtoni, Tanzania. Interviews were conducted using non-random sampling through formal and non-formal interviews with participants chosen by my translator, Shaban. Individual interviews and group interviews were conducted for my study. All data received was qualitative, and all my interview questions were translated from English into Kiswahili with responses were translated in the reverse order, with the help of Shaban.

My sample frame was the villagers of Ushongo. My sample populations were 1) 60 mamas and babas (Heads of Household); 2) 4 members of the Village Government including the village chairman, development officer, and environmental officer; and 3) a healthcare doctor. The total sample population consisted of 65 individuals.

This study was broken up into three stages. During the first stage of seven days, I chose to first interview the 30 mamas and 30 babas (n=60), in order to understand the issues within the village from the people who actually live there. I asked all interviewees the same set of questions (found in Appendix A), which are based on the WHO guidelines. Villagers were interviewed to determine not only their impact on sanitation practices, but also to discover the observations they have made personally on certain aspects of sanitation. Interviews were opportunistic; Shaban sought out subjects as we walked through the village. He asked people as we passed by if we could take several minutes of their time to ask a few questions, and if they agreed, we sat down on the spot and conducted the interview. These interviews were done between the hours of 1pm and 5pm.
The second stage, of five days, was used to map out and investigate the facilities described by the interviewees. Shaban assisted in finding all of the wells, toilets, and areas of high-density trash. He also helped me find specific people’s houses in order to paint the picture of a typical home in the village. This took about three days, including the time to draw out my maps. During this stage I also interviewed my key informants, which included the health care doctor and government officials. One day I interviewed the health care doctor in order to gain an understanding of the diseases and issues associated with sanitation and water from his perspective. He was asked a specific set of questions (found in Appendix C).

In order to get to the health center, Shaban and I biked 6km to the village of Mwera, which is the nearest health center to Ushongo. This took all day. The four government officials were interviewed with a specific set of questions in one day (found in Appendix B); these questions were similar to those asked to mamas and babas, however with a goal to officially determine the waste management policies as well as personal observations on sanitation in the village. These interviews were done between the hours of 11am and 4pm.

In the final stage, I held two focal groups were held. Ten mamas and ten babas were selected non-randomly from the previous group of interviewees with the help of my translator. My focal group questions can be found in Appendix D, and are based off of the answers I found from individual interviews. These groups were done in order to try and understand the effects of the poor sanitation individually and communally. During these focal groups I presented some of the information I had gathered to the mamas and babas in an effort to further discuss things I’ve observed, clarify any questions, and understand the effects. The focal groups were conducted between the hours of 1PM and 2PM.
Results and Discussion

As I stated in my introduction, this study examines the sanitation issues in Ushongo village and was broken up into three stages. Moreover, this discussion will be broken up into three distinct sections. The first aims to understand the access and quality of water in the village; results are drawn from the individual interviews, focal groups, and personal observations. The second part describes the sanitation of Ushongo by looking at the results from all interviewees, as well as drawing conclusions from my maps. The third part examines health, drawing conclusions from the interviewees as well as the doctor, and seeks to find a correlation between poor sanitation and health.

Part 1: Water

A: Descriptive analysis of the individual responses

After asking 60 mamas and babas nine questions, I got many similar answers, showing that many people agreed on the conditions of water in the village. There were two questions that all villagers gave the same answer. One hundred per cent (60 of 60) of villagers agreed that the water came from the ground (meaning a well) and that it was not clean (Figure 4). Furthermore, all villagers (60 of 60) agreed that there was not a water department in Ushongo (Figure 5).
These figures show that everyone in the village that I interviewed agreed that the water was not clean and comes from the ground. Furthermore, my results found that 92% (55 of 60) of people said that all people are getting access to water that is not clean. Moreover, villagers can get water from Ushongo Mabaoni that is cleaner, but it is still not fresh. In order to get this water, villagers have to buy from a man who brings it to Mtoni via donkey for 500 shillings per bucket (Figure 6). However, 8% of the villagers (5 of 60) told me that they can get drinking water from rainwater off the roof (Figure 6).
B: Qualitative Analysis of focal groups, government officials, health officer on water

WATER IS DIRTY:

After speaking to the government officials, focal groups, and doctor about where water comes from and if people have access to it, I learned that everyone agreed that all have access but the water is not clean. It comes from six wells, one pictured here (Figure 7). Water that comes from an unprotected dug well is considered an unimproved drinking water source according to the World Health Organization (2014). The village chairman said that the water is not clean and it is a problem for the village because the wells are too close to the ocean, which makes the water salty. Another government official said that the water was dirty because none of the wells are covered, so dirt and other contaminants get inside the well (govt officials pers. comm 2014). Because there is not a water department in Ushongo, the government said they have to go to Pangani district in order to try and ask for help. All four government officials said that they have gone to Pangani district water department and “tried to ask the big guys to help but they are still waiting,” and have “brought the problem to the government but they have not helped yet” (village chairman pers. comm 2014). Mamas and babas said that the government has said they would fix the problem, but they still haven’t fixed it. The babas mentioned
they are supposedly going to get water from Mwera village, but are still waiting. After examining the conditions of the wells, it was obvious that the water was dirty (Figure 8). There was a visible layer atop the water of algae, dirt, and trash. Furthermore, I found that all of the wells were uncovered and very close to the ocean, shown in Figure 3. Interestingly, the villagers are blaming the local government for the dirty water, and the local government is blaming the district government. Conclusively, the water is an unimproved drinking water source and the villagers agreed it is “dirty.”

WATER COMES FROM ANOTHER VILLAGE:

Although the water is dirty in Ushongo Mtoni, Ushong Mabaoni, 3K south, has cleaner, but still dirty, water. The mamas and babas said that they use water from Ushongo Mabaoni for drinking, cooking tea, and cooking beans. Water from Ushongo Mtoni is used for cooking ugali, showering, cleaning the house, cleaning dishes, and laundry (mamas and babas pers comm 2014). Basically, most daily activities are done with the “dirtier” water from Ushongo Mtoni with those few exceptions. Villagers are displeased that they have to buy clean water because it is inconvenient and it is expensive; one mama said, “500 shillings for one bucket is a lot of money” (mamas pers comm 2014). The frequency with which mamas and babas buy water varies from every day to once weekly.

Part 2: Sanitation

A: Descriptive Analysis of the individual responses regarding sanitation
The villagers gave me four different answers about location for disposal of urine and feces: government toilet, toilet in the house, bush, and beach. The majority of people (40% or 20 of 60) said that they used the bush, followed in frequency by beach at 28% (18 of 60) (Figure 9). Fewer people (17% or 11 of 60) responded that they used the government toilet or a toilet in the house (15% or 10 of 60) (Figure 9).

Twenty two per cent (13 of 60) of villagers said that they throw their wastewater in the bush, 33% (18 of 60) into the sea and the rest (48% or 29 of 60) said they dig a hole near the house, put the water inside and then put sand on top once it is full (Figure 10).
Disposal of trash is mostly (62% or 38 of 60) done by digging a hole near the house, putting trash inside that hole, and then burning once full. However, 22% (13 of 60) throw into the bush, 13% (8 of 60) throw on the beach, and a rare few, 3% (2 of 60), put the trash near the beach and then burn it. These percentages are shown in figure 11.

Though a waste management policy for Ushongo Mtoni village does exist, few people
actually follow it. Half (30 of 60) of the villagers reported that they don’t follow the protocols, and the other 50% (30 of 60) only sometimes follow them (Figure 12).

**Figure 12:** Percentage of people who sometimes follow/don’t follow waste management policy/rules in Ushongo Mtoni

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### B: Qualitative Analysis of focal groups, government officials, health officer on sanitation

**TOILETS, OR LACK THEREOF**

One of the biggest issues with poor sanitation is open defecation. Open defecation means lacking any latrine, toilet, bucket or box (George 2008). As previously stated, open defecation and a lack of improved sanitation facilities are detrimental to human health, being a major contributor factor to multiplicity of water and sanitation-related diseases as well as a source of ground water pollution. In Ushongo, open defecation is common practice, as 68% (44 of 60) of villagers said they defecate outside of the government toilets or a toilet in their home. When I asked the doctor if there was good sanitation in Ushongo, he said “no, because they don’t have enough toilets. We advise them to have toilets.” (doctor pers. comm 2014). The government officials I spoke to all agreed there are four government toilets, but that few people use them. They acknowledged that it is a problem and said “it would be
ideal to get six more toilets separate for lady and men” (gov’t official pers comm 2014). The government officials also mentioned that four toilets is not enough for the village, that they need help to build more toilets, and that they don’t have the money (Gov’t official pers. comm).

Villagers reported two main reasons for choosing not to use the government toilets: there weren’t enough toilets and they were too far away. Villagers said that they needed more toilets on the other side of the village, closer to their homes (mamas and babas pers. comm 2014). After personal investigation, I did find that the four government toilets were at the northern edge of the village and far away from where most of the villagers lived (Figure 3). Furthermore, the toilets were dirty and it seemed as if there was minimal maintenance to keep them clean. (Figure 13). The village would benefit greatly from building six more toilets closer to where most villagers live.

WASTE MANAGEMENT POILCY: IS IT WORKING?

Trash and wastewater are both forms of waste that if disposed improperly can contribute to an unclean and unsanitary environment. The village of Ushongo does have a waste management policy, and it is as follows:

(1) Dig a hole near your house, put trash inside the
hole and then burn it.

(2) Do not throw trash on the beach.

(3) Dig a hole, put wastewater in it and then cover with sand (govt officials pers. comm 2014).

However, the government officials all said that since most people don’t follow these rules, it is a problem because they want the beach to look nice for tourists (govt officials pers comm 2014). When asked why they didn’t follow the rules, the mamas and babsa said because they just “don’t care” (mamas and babas pers comm 2014). One government official reported that the policy isn’t being adequately enforced and that the village leaders are planning a meeting to tell villagers the rules and make them “afraid” by charging a penalty of 50,000 shillings for one offence (gov’t officails pers comm 2014). The babas said that the government doesn’t enforce the rules and that they don’t care about the rules. They also mentioned that the “rules are not fair because they tell people to follow them but they don’t enforce if you are born here. But if you are not born here they try to push the rules and punish you” (babas pers comm 2014). After personal investigation, it was clear that many of these rules were not being followed, as I often saw people throw dirty water and trash on the beach, and trash could be seen clumped throughout the village (Figure 14 and 15). The bush area was also covered with trash, however it was more scattered throughout (see Figure 15: Scattered Bush in Ushongo Mtoni).
Figures 3 and 15). Ultimately, the waste management policy is not working: not only do few people follow it, but the government does not enforce it. As a result, there is visible trash and dirty wastewater in the village.

Part 3: Health

A: Descriptive Analysis of the individual responses regarding health

After speaking to the villagers, I learned that there are a variety of sicknesses that are likely to appear in their homes. While all interviewees reported more than one sickness, responses varied from two to six different sicknesses per household. From most to least common, 40% of the people said malaria (44 of 60), 14% stomach (15 of 60), 10% flu (11 of 60), 9% chest (10 of 60), 8% fever (9 of 60), 5% head pain (5 of 60), 4% skin problem (4 of 60), 3% sugar in the blood (3 of 60), 1% typhoid (1 of 60), 1% diarrhea (1 of 60) (Figure 16).
After speaking to the doctor at the health center in Mwera, I discovered that malaria is the most common disease. The villagers also told me that malaria was common, as the largest number of people said malaria (44 of 60). However, the doctor told me that other problems do exist but are less common: such as rashes from dirty water and typhoid fever, which is an intestinal diseases caused by fecal matter (doctor pers. comm 2014). He also said, “I advise people to have good preservation of food and people to use toilets so there is less typhoid fever” (doctor pers. comm 2014). Furthermore, when I asked if any sickness came from the water he said, “there is no stomach sickness from water because the water is salt which helps to prevent from some bacteria. It happens, but in low percentages” (doctor pers. comm 2014). However, 15 out of 60 villagers told me that they get stomach sickness. This led me to believe that villagers don’t go to the health center when they are having stomach sicknesses.

During my visit to the health center, the first question I asked was, “What is sanitation” (Appendix C). The doctor responded that: “sanitation is how we keep our environment clean” (doc pers. comm 2014). He proceeded to say that there is not good sanitation in Ushongo because they don’t have enough toilets for the population. The doctor also mentioned that poor trash disposal affects health if it has matter that causes infection, as it often contains microorganisms and bacteria. With this information, I asked the villagers in focal groups, “what has caused the common health problems: stomach, flu, chest, skin, typhoid?” (Appendix D). The mamas said that they get these problems because the
environment is not clean, and that if the environment were clean they would get rid of all of these sicknesses (mamas pers comm 2014). The babas said there are two reasons: because the environment is not clean and because the water is dirty (babas pers comm 2014). After my personal investigation, it was clear that the environment was not clean. As previously stated, trash, wastewater, and feces were visible throughout the village.
Limitations and Recommendations

Limitations

There were some possible limitations and biases that should be taken into consideration if someone were to repeat my study:

- There might have been biased responses because I am a *mzungu* and the power differential might have affected some of my interview responses.
- There might have been some miscommunications with my translator, Shaban when translating questions and answers from English to Kiswahili, and vice versa.
- My translator had tendencies to skip questions and infer answers rather than asking directly. Many times my translator would change answers or alter questions rather than sticking to the structured interview format, which was created in an attempt to avoid biases.
- Some participants were more willing than others to participate.
- During the focal groups, it seemed some of the mamas and babas were shyer and less willing to speak. There were often only two to three people who would respond and then the rest would just agree.
- The short amount of time given for this study limited the number of interviews and amount of data that could be collected.

Recommendations:

If there are individuals that wish to do a social science project in Ushongo, I would highly recommend it. The villagers were very friendly and the government seemed to appreciate us being there. I think it would be interesting to re-conduct my study in a few
years to find out if sanitation has improved (if Ushongo Mtoni has gotten clean water from Mwera, if the government has built more toilets, etc.). I would also suggest conducting this study in Ushongo Mabaoni or Mwera, and then comparing that data to that of Ushongo Mtoni. Mwera would be interesting because of the large sisal plantation there; because of the plantation it seemed like people had access to more resources, including clean water. An alternative idea that could yield interesting information would be to study specifically the clinic in Mwera about health. My final idea, a suggestion from the focal groups, is to create a program about keeping the environment clean and then go from house to house with the goal of educating the community. The focal groups all agreed that they needed someone to come and educate the people on how to keep the environment clean.
Conclusion

Poor sanitation and lack of clean water is a major problem in the world because it can cause diseases and sicknesses. One sanitation specialist has estimated that people who live with inadequate sanitation ingest ten grams of fecal matter every day. Poor sanitation, bad hygiene, and unsafe water – usually unsafe because it has fecal particles in it – cause one in ten of the world’s illnesses (George 2008). Furthermore, modern sanitation has added twenty years to the average human life and Harvard University geneticist Gary Ruvkun believes that “the toilet is the single biggest variable in increasing human lifespan” (George 2008). This, to me, is a call for action, and clearly shows that poor sanitation has harmful affects on the environment and on people. Knowing where poor sanitation occurs is important for education and eradication. This study looked at the sanitation and clean water in the village of Ushongo. Sanitation is how we keep the environment clean – the villagers reported that the reasons for illness were an unclean environment, or rather inadequate sanitation. My findings were valuable, as I learned that many people practice open defecation and the entire village does not have access to clean water. Both of these findings are a result of inadequate sanitation, according to the World Health Organization. The target goals of eliminating open defecation, achieving universal access to basic drinking water, and sanitation and hygiene for households have not been met in Ushongo village. Some possible solutions include building more toilets for the village, pumping water from Mweru, and consolidating trash in a specific, contained place.
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ON, PROGRESS. "SANITATION AND DRINKING-WATER." (2013).

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APPENDIX A:

Individual Interview questions for Mamas and Babas

1. Where does your water come from? Is it clean? Maji yenu yanatoka wapi? Je ni maji safi?
2. Is there a water department here? Kuna idara hapa? (yes… iko wapi?)
3. Are all people getting access to water? Watu wate hapa wanapata maji safi? Kwanini?
4. Where do people dispose of their urine and feces? Watu wengi wanajisaidia wapi?)
5. Where do you dispose of wastewater? (unamwaga wapi maji yako machafu?)
6. Where do dispose your trash? Unatupa wapi tatataka zako?
8. What kind of diseases are likely to appear in your home? Ni magonjwa gani yanawapatane mara kwa mara nyumbani kwenu?
9. Where do you cook your food? Unapikia wapi chakula chako ? ndani au Nje?
APPENDIX B:

Interview question for government officials: consensus interviews

1. Where does your water come from? Is it clean? Maji yenu yanatok a wapi? Je ni maji safi? Is this a problem? Why or why not? How can it be fixed? What is preventing it from being fixed?

2. Is there a water department here? Kuna idara hapa? (yes… iko wapi?)

3. Are all people getting access to water? Watu wate hapa wanapata maji safi? Kwanini? Is this a problem? Why or why not? How can it be fixed? What is preventing it from being fixed?

4. Where do most people dispose of their urine and feces? Watu wengi wanajisaidia wapi?) Is this a problem? Why or why not? How can it be fixed? What is preventing it from being fixed?

5. Where do people dispose of their wastewater? (unamwaga wapi maji yako machafu?) Is this a problem? Why or why not? How can it be fixed? What is preventing it from being fixed?

6. Where do people dispose of their trash? Unatupa wapi tatataka zako? Is this a problem? Why or why not? How can it be fixed? What is preventing it from being fixed?


8. What kind of diseases are likely to appear in the village? Ni magonjwa gani yanawapatane mara kwa mara nyumbani kwenu? Where do people go if they get sick?

9. Where do people cook their food? Unapikia wapi chakula chako? ndani au Nje?
APPENDIX C:

Interview questions for health center doctor: consensus interview

1. What is sanitation?
2. Is there good sanitation in Ushongo?
3. What diseases and sicknesses do you most often find?
4. Where do the people of Ushongo get their water?
5. Are there any sicknesses that come from the water?
6. Is trash bad for sanitation?
7. Is there education about keeping the environment clean?
8. How many doctors are here?
APPENDIX D:

Mama/Baba Focal Group Interview Questions

1. Everyone said that the ground water is not clean, what effects has this had on your family? Can this problem be fixed? What is preventing it from being fixed? 

2. How often do you buy water from the other village? Is it expensive?

3. Does it bother you that you have to buy clean water from the other village?

4. What do you use the water for from this village (Ushongo Mtoni)?

5. What do you use the water for from the other village (Ushongo Maboni)?

6. Is the water from the rain cleaner than the water from the ground?

7. Many people said they used the beach/bush, why do you not use the government toilet?

8. Do you think the government rules should be enforced?

9. Are there any rules that should be changed?

10. What has caused the common health problems: stomach, flu, chest, skin, typhoid, uti?