

**INSTITUTE FOR ENVIRONMENT  
AND  
SANITATION STUDIES (IESS)  
UNIVERSITY OF GHANA**

**COASTAL COMMUNITY RESILIENCE  
TO CLIMATE AND DIARRHOEA (C2R-CD)  
PROJECT**



**Report on Second Reconnaissance Trip**

**Work Packages 1 – 4**

**West Coast – Opetekwei, Mumford – Greater Accra and Central  
Region**

**East Coast - Anyako, Anyanui, Atiteti - Volta Region**

**November 7 - 11, 2020**

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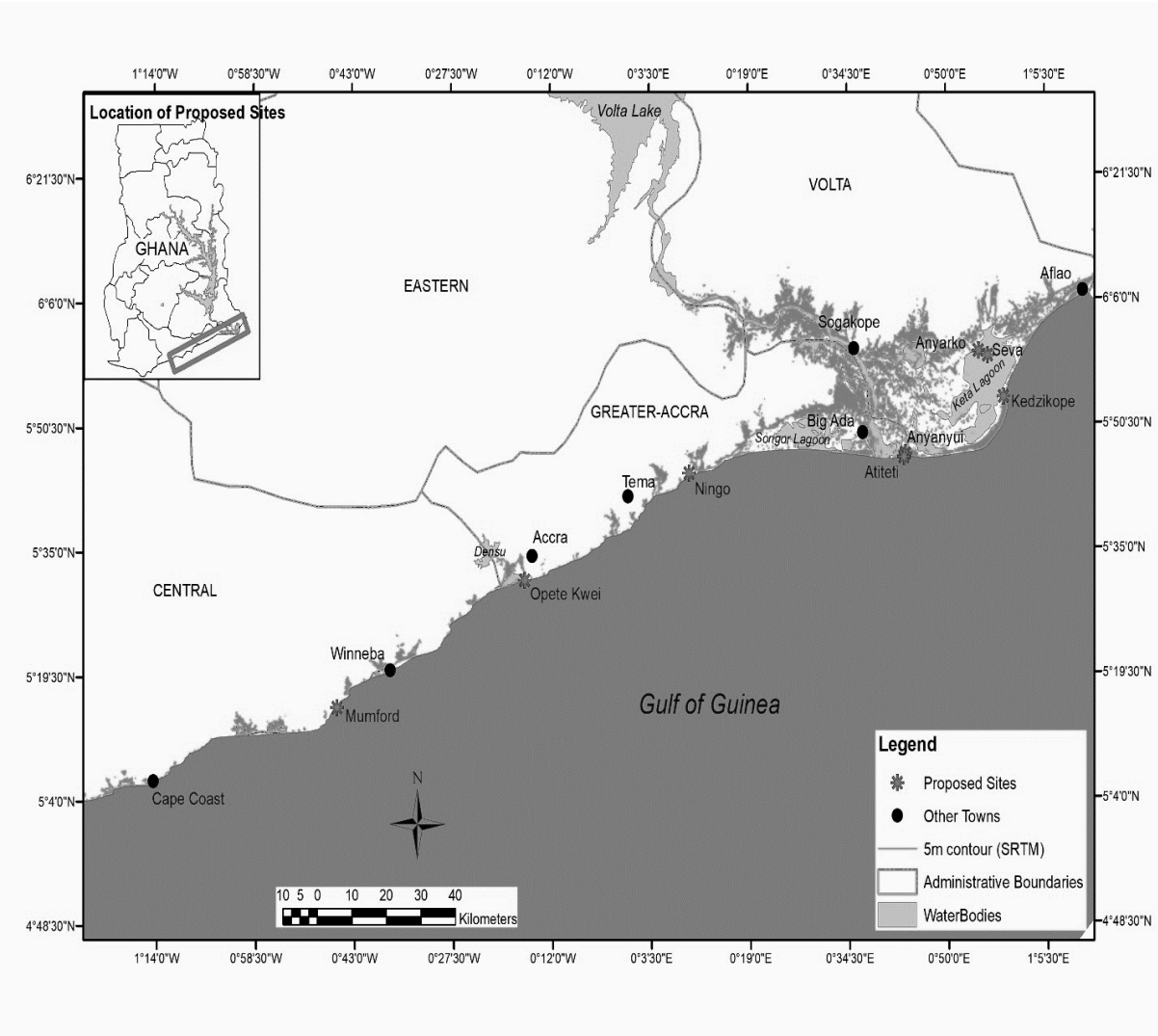
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## **INTRODUCTION**

The DANIDA Project on the Coastal Community Resilience to Climate and Diarrhea is being undertaken by Aarhus University in collaboration with the University of Ghana, People's Dialogue on human settlements and the Environmental Protection Agency. The overall goal of the C2R-CD project is to build resilience to climate change and improve diarrheal management in coastal communities. The study will focus on communities found along the eastern and central coastline of the country, which is the most vulnerable to sea-level rise and flooding events. As part of a reconnaissance survey, one group of the C2R-CD Project Team undertook a three-day (7th, 9th and 10th November) reconnaissance trip to the project study communities and their respective Municipal/District Assemblies along the west coast of Ghana. They are; Mumford, Gomoa West District Assembly (GoWDA), Opetekwei Ablekuma West Municipal Assembly (AbWDA) in the Central and Greater Accra region respectively. The second group visited three coastal communities located in the Volta Region (Anyako, Anyanui and Atiteti in the Keta Municipal and Anloga District Assemblies) from the 7th November – 11th November 2020. The objective of the visit was to familiarize ourselves with the study communities and interact with key community leaders.

# WORK PACKAGE 1

## *WEST COAST*



## SITE A (OPETEKWEI)

Opetekwei is a town located in the Ablekuma West district, Accra Metropolitan Area ( $05^{\circ}31.521' N$  and  $000^{\circ}16.480' W$ ). The main occupation of the people is fishing, although there are few professional working-class people in the township.

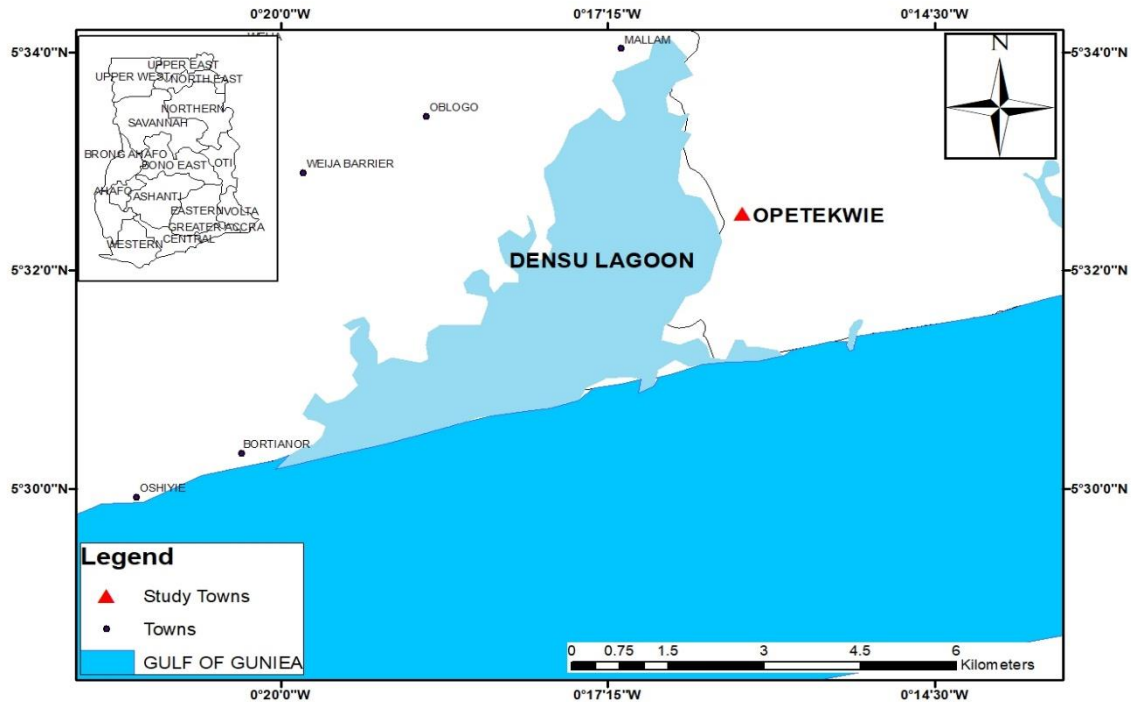


Figure 1: A map of Opetekwei.

The trip to Opetekwei took place on 7<sup>th</sup> November 2020 around 7:40 am GMT. The purpose of this trip was:

- a. To help the participants familiarize themselves with the Opetekwei township
- b. To get key persons who can share information about the Opetekwei township in relation to flooding, diarrhoea and the general health status of the community.
- c. To closely observe the Opetekwei township
- d. To officially introduce the C2RCD project to some key players in the community.

### Community interaction

During the community interaction, the C2RCD project team discovered that, Opetekwei has just two containers for dumping of rubbish (figure 3) and as a result, some of the inhabitants preferred dumping plastics and food waste into the gutters and drainage systems. This results

in blocked drainage systems in some parts of the town causing flooding when it rains. The assembly representative present said, there are some cases of cholera in the Opetekwei area from time to time. The main source of drinking water in Opetekwei is pipe water. However, there are some few wells around.

The project team also discovered that Opetekwei is low-lying (figure 2) and as a result, the town floods easily. Again, some houses have been built on some drainage systems and waterways causing further drainage issues (figure 4).

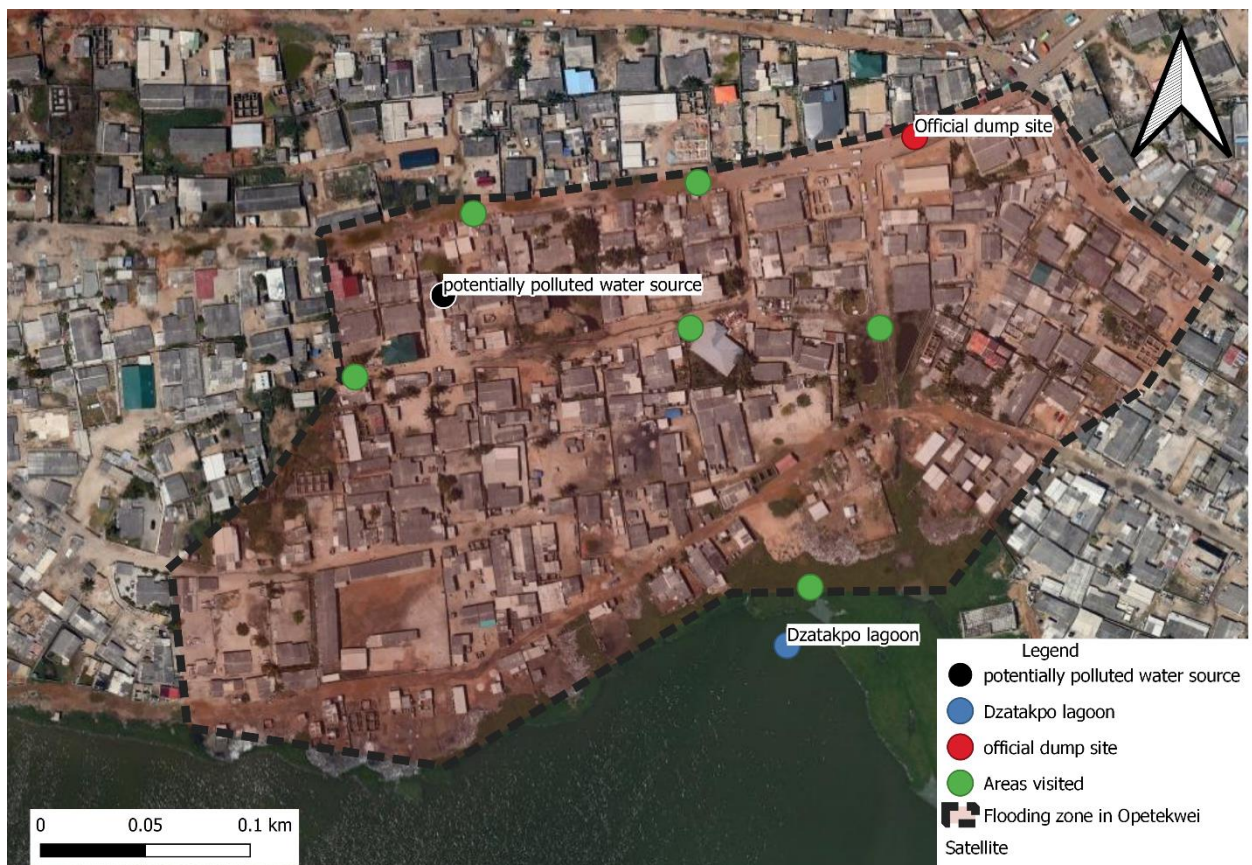


Figure 2: A map showing the flooding zone in Opetekwei.



Figure 3: A picture of the dumping containers in Opetekwei.



Figure 4: A picture showing house built on drainage systems.



Figure 5: A picture showing some flooded areas in Opetekwei.

The project team proceeded to the district assembly for information pertaining to data on historic/current flooding and diarrhoea events. The NADMO administrator, Madam Epiransah Mensah mentioned that, they did not have a lot of data on flooding because of some institutional constraints in NADMO. However, the Ablekuma South NADMO office drafts memo after flooding events in Opetekwei. Which means they can give the C2RCD project team a copy of their memo from 2015 to 2020.

The Disease Control Officer, Mr. Daniel Tetteh also expressed his concern of the lack of data for the Opetekwei township. This is mainly because there are no hospitals in Opetekwei. This therefore means obtaining consistent historic and current diarrhoea data will be impossible. However, some data on diarrhoea can be acquired from the korlebu hospital.

### Trip outcomes

The trip was successful and the community stakeholders together with the elders in Opetekwei were happy about the C2RCD project and were willing to work with the project team.

### SITE A (MUMFORD)

Mumford is a coastal town located in the Gomoa West District, Central region (05° 15.653' N and 000° 45.373' W). As of 2018, Mumford had a settlement population of 25,876 people. It is a fishing community.

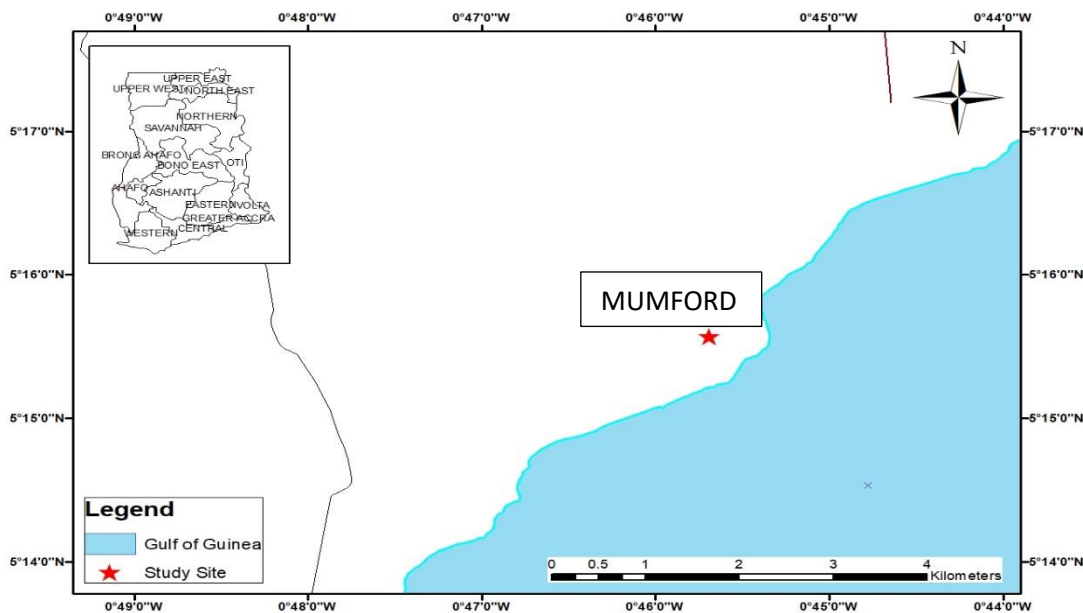


Figure 6: A map of Mumford.

The trip to Mumford took place on 16<sup>th</sup> November 2020 around 1:40 pm GMT. The purpose of this trip was:

- To help the participants familiarize themselves with the Mumford township
- To get key persons who can share information about the Mumford township in relation to flooding, diarrhoea and the general health status of the community.
- To closely observe the Mumford township in terms of flooding and diarrhoea cases
- To officially introduce the C2RCD project to some key players in the community.

### Community interaction

During the community interaction, the C2RCD project team were introduced to the community leaders by Mr. Isaac Adoah, the assembly man of the Mumford town (Figure 7).



Figure 7: A picture showing interaction between the project team and the community members.

Officially Mumford has just two containers for dumping of rubbish (figure 8) and as a result, elders of the town have designated some other areas for dumping of refuse (figure 9). However, the problem is, when it rains, the Eyinfa lagoon floods towards the dump site thereby pushing the polyethene bags into the drainage systems around (figure 10). This results in blocked drainage systems in some parts of the town causing flooding when it rains.

The community members mentioned that the most common disease in Mumford is Malaria. Although, there are few cholera issues from time to time.



Figure 8: A picture showing a dumping container in Mumford.



Figure 9: A picture showing a designated dumping site in Mumford.



Figure 10: A picture showing a drainage system in Mumford full of polyethene bags.



Figure 11: A picture of the Eyinfa lagoon.

### Water systems in the community

#### Drinking water system

Regarding the drinking water sources in the community, the community leaders said they depend solely on pipe water from water tankers for drinking. Sometimes the pipe water taste salty especially during the dry season. The people of Mumford rely on the expensive pipe water because most of their natural sources of drinking water has been polluted with rubbish and waste (E.g. The Burapaa drinking water system).

#### Other water systems in the community

In order to save money and make use of the natural sources of water, the community members make use of a natural water pool (Ekuku pool) that comes from underground (figure 12). They have also dug a pool that stores rain water. These water systems are used for bathing and washing of bowls.



Figure 12: A picture showing the Ekuku pool.

### *Interaction with the coastal engineer*

Around 2016, the people of Mumford requested for help from the government concerning a landing beach. This was because it was difficult to land canoes in Mumford (as a result of rough waves that hit the shores of Mumford).

Their request was granted and China Harbor Engineering Company was contracted to build a landing site (Jetty) for the Mumford community (Figure 13)



Figure 13: A picture showing the jetty being constructed for the Mumford community.

As a result of the construction, there is a break in the natural sediment budget dynamics. Also, the angle of wave attack has been changed from the natural situation because of the shape of the jetty. This has however resulted in serious erosion towards the down drift side of the beach (figure 14). Members of the C2RCD project were able to interview the chief engineer on site (Mr. Daniel Ewool). Mr. Ewool confirmed that the jetty was the cause of the erosion and they are looking at changing the shape of the jetty in order to arrest the damage being caused.



Figure 14: A picture showing the eroded side of the beach.



Figure 15: A map showing the accretion and erosion zone of the Mumford beach.

The project team proceeded to the district assembly for information pertaining to data on historic/current flooding and diarrhoea events. The NADMO director, Mr. Essuman mentioned that, they did not have a lot of data on flooding because of some institutional constraints in the

NADMO. However, they can get irregular data from 2007 for the C2RCD team. The health department had an event so it was not possible to meet with the health representatives.

### *Trip outcomes*

The trip was successful and the community stakeholders together with the elders in Mumford were happy about the C2RCD project and were willing to work with the project team

### ***EAST COAST***

We arrived in Anyako, the first community around 7:45 pm on the 7<sup>th</sup> of November, 2020. The next day, the research team attended various church services with the community members where we introduced ourselves to them. A meeting was organized with the help of the Assemblyman. This meeting was held at 2:00 pm in one of the church buildings. The majority of those in attendance were males with few women. At the meeting, representatives from the community and the team were selected, and the mission was further explained. Members of the different work packages had one on one interactions with the participants using a set of prepared questions. Their sources of water which used to be pipe-borne was broken and never repaired so pipe water is bought from the neighboring town. The households which had groundwater sources such as boreholes and wells disclosed the fact that the water was salty hence was used for only washing and not drinking. It was observed that though the town was covered in so much refuse one would assume the diarrhea cases will be high but the interaction with the community members showed they had extremely low cases of diarrhea.



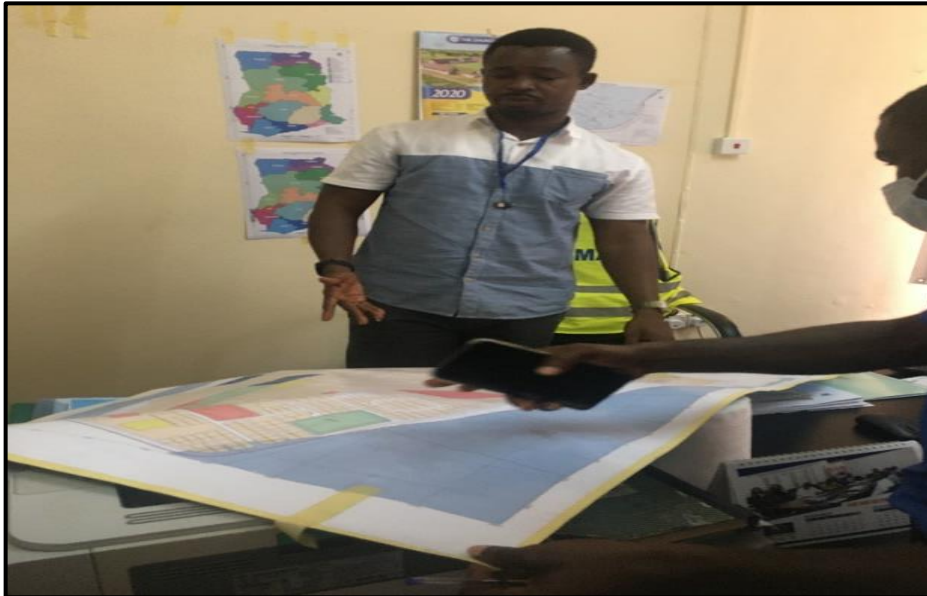
***Plate 1: Meeting held with the people of Anyako***



***Plate 2: Refuse Dumped in and around the Lagoon***

On the 9<sup>th</sup> of November, we had a brief meeting with the nurses and doctors at the Anyako Health Center at 9:00 am. Through our interactions with them, they confirmed the fact that the community didn't have a source of drinking water and had to buy from the neighboring town because their groundwater sources were salty. They also spoke about the low cases of diarrhea in the community. We headed to the Keta Municipal Assembly since Anyako falls under that district. After introductions at the Assembly, each Work Package Group went round interviewing their informants which include; the Planning Officer, Works Officer, and the Health Unit. Work Package One went ahead to interview the Planning Officer. In Keta, the main drinking water sources are pipe-borne and boreholes. The groundwater sources, he said

are salty though the locals claim it's not perhaps because they have consumed the water for so long hence their body has adapted to the salt content. With questions on farmlands, from my observation, all the farmlands had wells that are used for irrigation. With regards to flooding issues, it was discovered the whole area is prone to floods, however, the sea defense has reduced the rate of flooding. We also visited the Health Directorate to seek more information on the diarrheal cases in the town and request data on some cases which will be used for observations and comparisons during the project.



***Plate 3: Meeting with the Planning Officer at Keta Municipal Assembly.***

Anyanui was also visited on the 10<sup>th</sup> of November. We had a very brief meeting with the second Nurse in charge who readily answered questions from our work packages. Once again, the cases of Diarrhea were confirmed to be low with rather high cases of Malaria. A meeting was held at the Anyanui Basic School at 10:30 am with the community members comprised of mostly males and few women. The main occupation of the people is fishing and farming. The team was introduced by Dr. Yirenya-Tawiah. It was discovered that although pipe-borne water is the source of water in the community, the majority of the households have wells and boreholes. According to the community members, they have no issues with salinity in their groundwater sources. The farmers also stated that just a small portion of their farmlands had a high content of salt. They depend on the rainfall to help reduce the salt content of those areas of their farmlands but the heat from the sun lately has affected them and the crops. From my observation, most of the houses have been reclaimed by the sea before the sea defenses were put in place. The farmlands in the community also had wells on them with the areas with high

salt content left aside. After the meeting, half of the team went to Atiteti and the rest of which I was a part of engaged in a transit walk to pinpoint and map out main landmarks in the community. We caught up with the others afterwards.

In Atiteti, we were unable to interact with the community members because of a campaign was being held, but we engaged two older men who were available. Like the information received from Anyanui, their land and crops were affected by the sea intrusion and as also contaminated their groundwater sources. Diarrhea was not problem in Atiteti as well.



*Plate 4: Meeting with the community members of Anyanui*



*Plate 5: Well on a farmland*

The last place visited during the field visit was the Anloga District Assembly. We arrived at the Assembly at 9:30 am and introduced ourselves. The Planning Officer except for Work Package One took the rest of the Work Package Groups to the Departments they requested to interview. Work Package One Group had an interaction with the Planning officer. The source of water for the Anloga district is pipe water which is gotten from Adidome and the Akatsi area. He mentioned areas that are prone to flooding both by high tides and rainwater include Anyanui, Shime, Bomigo, etc. The entire team had another meeting Another with the NADMO personnel and the Health Unit.

## **CONCLUSION**

In conclusion, the survey was very insightful and educational. It was discovered that all the communities visited recorded low cases of Diarrhea despite the state of poor hygiene and sanitation in these areas, hence creating an avenue for research to determine and investigate the local measures put in place to curb this. However, local language of the people that is Ewe was a challenge to a few of us during the field visit.

## **WORK PACKAGE 2**

The objectives of work package 2 was identify all stakeholders in the community, identify selected needs and the individuals or institutions that can assist in identifying these needs. Listing all sources of diarrhoea data. Identification of WASH structures or systems and their location in the community. Food storage systems and identifying household WASH systems.

### ***WEST COAST***

On Saturday 7 November 2020, a reconnaissance trip was taken to the Opetekwei community in Ablekuma West Municipality, Greater Accra. The aim of the meeting was to interact with the major stakeholders at the study site who would help the work package obtain the data on interest to them. The trip began with a meeting with community stakeholders. They were debriefed on the project and specific stakeholders of interest to each work page interviewed to obtain the right information needed. The meeting was followed by a transverse walkthrough out the community. Points of interest were water sources, drainage systems, toilet facilities, water bodies, and flooding sites. On Monday 9 November the team also met various officers at the Municipal health directorate and engaged them. Officials from NADMO, Municipal Health Directorate, Environmental Officer were interviewed.

### **General comments**

- There are 3 or 4 licensed chemical shops in the community. The shops can give information on drugs sold to clients. Not sure if records are available.
- Illegal waste management by the lagoon and drains.
- Intervention of GASSIP for household toilets started but the terrain is waterlogged making it difficult
- Accessibility intervention (area not easily accessible)
- Built up community not conducive for the intervention
- Informal waste collectors used
- No government health facility, only private hospital
- Public announcements made by information vans in the evening and early morning. No PA systems in the community
- To collect data in this district, a form of identity (ID card) is needed

- Best time to engage the community (estates) is Sunday after church (3pm). The slum area is available throughout the day.
- Community has 2 dynamics (estate and zongo/ slum)
- Opetekwei is under the Agege Poase sub-district in DHIMS 2, was initially reporting was done under Mamprobi when the municipal was part of Accra metro Accra metro (about 2 years ago). No facility in Opetekwei reports directly into DHIMS 2. Information available would only be for the Agege Poase sub-district.
- Further details and contacts of stakeholders can be found in the appendix

## **Mumford**

- On 11 November 2020, a similar trip was made to Mumford. met with community stakeholders
- There was a meeting with community stakeholders. Stakeholders present included unit committee members, fishmongers representative, youth representative, chief fisherman, health workers. They were debriefed on the project the team then engaged specific stakeholders in the community. This was followed by a one on one there action for the various work packages with the stakeholders. Contact details and other information such as water, hygiene and sanitation practices was collected.
- The team then went for a transverse walk in the community. The focus was the sea shore which had two dumping sites and a landing bay under construction.
- The team visited the institutions such as NADMO, Environmental health and the planning officer of the district assembly. The Ghana Health service staff were not available at the time of the visit.

## **General comments**

- There are 10 chemical sellers in the community. They do not have any local association of OTMCS operators in Mumford
- No records are kept by OTCMS
- Public toilets in the area are managed by the Area Council.
- Pipes are all private owned pipes
- Concrete tanks are built to harvest rain water
- Special portion of beach designated for open defecation

- The best time to meet the community is at the end of the month when the experience full moon. During those times, fishing activities go down thus people have the time to participate in the project's activities.
- Data in DHIMS available under Mumford sub-district

## ***EAST COAST***

### **Anyako Evangelical Presbyterian Church – November 8<sup>th</sup>, 2020 2:00 pm.**

Anyako is a small island in the Keta Municipal Assembly and its geographical coordinates are 5° 59' 38.26" N, 0° 55' 3.81" E. The town is surrounded by the Keta lagoon with its inhabitants involved in fishing. Some parts of the lagoon are designated for dumping of waste materials. There is open defecation by children and adults along the banks of the lagoon. On the 8<sup>th</sup> of November some of the East coast members and I attended church at Anyako Evangelical Presbyterian Church, during the announcement time the team was introduced to the congregation. Some of the members of the community gathered at the Anyako Evangelical Presbyterian Church at 2:00 pm and were engaged by the East coast team.

Since 2003, the water pumping machine got spoilt this led to no access of portable clean water, so the public tank is not in use. Water is acquired from wells and the water is salty and requires liquid soap and detergents to be able to be utilised which is expensive, the well water is used for bathing. Clean water is bought from car tanks from neighboring town like Abor and Heluvi which is also expensive. Some households buy water into their tanks and then sell to the neighbours. Based on the interaction with the members of the community, it was noted that some households have toilets with other having none at all. There is a total of five public toilets in the town. The toilet system used are the water closets and pit latrines, water from the lagoon is used in flushing, this leads to rusting. The pit latrines accumulate water which renders it ineffective. It was noted that in case of diarrhoeal outbreaks, the affected persons are taken to the hospital at Abor, they do not use herbal medications.

The people also engage in domestic poultry and goat rearing. There are three drug stores in the town, drug sellers from Akatsi and Aflao come to Anyako on the market days which is every five days. The women of Anyako are traders, they sell fried fish, tomatoes and other food stuffs. Traders from the surrounding towns go to buy fish products from traders in Anyako. Most

inhabitants prepare their meals based on what is consumed daily, a small number store some foods. The household waste materials are dumped into the lake, gathered and burned. The people believe that this practice helps in reclaiming the land and creating new ones to be utilised for building.



Fig 1. Anyako Lagoon banks



Fig 2. interaction at E.P church, Anyako.

#### **Anyako Health Centre Anyako-Kpota. November 9<sup>th</sup>, 2020, 9:20am.**

There is no presence of a physician assistant which has led to low attendance at the health centre. Because of Covid-19 the attendance decreased but has picked up again. The centre acquires its medical supplies and about 99% of the drugs from the regional medical store, the drugs in the centre are insured. Most cases recorded at the centre are typhoid and malaria. From the health personnel in the centre the inhabitants of Anyako believe the salinity of the lagoon helps kills pathogens which prevents disease outbreak. There are personnel that help carry out the day to day activities at the centre and they are: midwife, general nurses, Laboratory technicians, registered community health nurses, nursing officers, community health nurses – nurse assist preventive, enrolled nurses – nurse assist clinicals, Orderlies, cleaners and national service personnel.

## **Keta Municipal Assembly. November 9<sup>th</sup> 2020.**

NADMO Coordinator – Mr Blago.

The East coast group visited the Keta Municipal Assembly, we visited the NADMO office and had a discussion with the NADMO administrator Mr Kpodo. He mentioned that Anyako is flood prone area and the organisation helps Anyako community by giving relieve items and also advising them on disaster management strategies. They people are advised to stop building in water ways but since the people are used to the flooding, they sometimes reject the advices given. He also made mention of the Organisation not receiving monetary support from the assembly. Anyako people make no effort to manage the flooding, they mostly dump rubbish into the lagoon to retain the land to build on. The Anyako land is clayey there they can not access sandy soil to help build sand bags. He made mention of there being a gab in information between NADMO and Ministry of Health. The organisation has some activities namely action plan and collaborating with fire services and also with Health administration. The action plan is carried out every quarter, there is radio education twice a month on Jubilee radio on 106.9 frequency, Suncity radio 88.9 and also community entry to educate the people and this is carried by the assembly members. NADMO zonal officers engage with the communities. There is no education on vectors of diseases, NADMO disaster management committee is made up of Environmental information, police and assembly man of the affected places. NADMO involves other sectors in its activities when needed, Anyako has a disaster volunteer group but it is dormant. It is worth noting that why the community health volunteer system is working whiles NADMO volunteering system is not working. He also mentioned Fuveme is losing its land due to the sea destroying it. The people of Fuveme are being located to Attiteti and Akorkedzi. The land being inhabited in Akorkedzi is under litigation because it belongs to a family who are unwilling to release the land. Before relocation is carried out, the land needed should be safe and have no issues.

## **Social Welfare and Community development office. November 9<sup>th</sup> 2020.**

At the social Welfare office, the group met Ms. Faustina Borkloe and had a discussion about the roles of office in the communities. There are two officers in the Welfare office. The office deals with vulnerable persons like the aged, children, women and sick persons (AIDS, TB) and disabled people. The officers visit the communities determine to be in the poverty category to interact with the people. There are LEAP programme, the Livelihood Empowerment Against Poverty is a cash transfer *programme* to help extremely poor communities. There are about

709 beneficiaries. The poverty map is used to determine the beneficiaries most in the Shime area with more than 200 beneficiaries in Atiavi, Ketu Afiadenyegba. Payment of monies are made once every two months. On payment days about 150 people come from Anyako and Seva to Abor. There are special cases and these are people living with HIV AIDS. Communities are graded as poor based on conditions of the roads, water and buildings. There are groups and meeting dates for disabled persons in the poor communities.

**Keta Municipal Health Directorate. November 9<sup>th</sup>, 2020.**

At the Keta municipal health directorate, the met with the disease control team, they spoke about how Anyako doesn't have portable water. Water is transported from Abor to Anyako, they also harvest rain water. There is open defecation along the banks of the lagoon and also dumping of rubbish in the water. They mentioned the fact that the assembly has been informed about the water conditions in Anyako. There is education on safer ways of treating the stored water, some NGOs sell aquatab to the local to help purify the collected water. Anyako subdistrict officer is at Anyako health centre, there is a surveillance system for diarrhoea. Quarterly durbars are encouraged to be organised to educate the people in the communities. There are weekly radio programmes to educate the people. The directorate collaborate organisations like Health keeper, Marie stopes and Seek to save. The directorate takes advantages of the programmes of these NGOs and chip in the health programmes, there is sensitization and education on proper sanitation. There is Vaccination called Rotovac for children under five years. They also noted that the traditional practisioners sometimes work with the directorate.

**Anyanyui Evangelical Presbyterian School. November 10<sup>th</sup>, 2020.**

We had a discussion with the head teacher Frederick Nyavorwoyi. He spoke about how mosquitoes and malaria was the problem for the people of Anyanyui. He is also spoke about the quest house Meet me there has been providing household toilets for the inhabitants. He said people engage in open defecation in the water bodies and also in the bushes, now the bushes are being cleared for farming that reduced the occurrence in open defecation. A general gathering was organised to meet the people of Anyanyui to introduce ourselves and the project to the community which lead to them asking questions concerning their livelihood.



Fig. 3 interaction with the Anyanyui community

**Anyanyui Health Centre. November 10<sup>th</sup>, 2020.**

At the Health we had a discussion with the Midwife madam Gifty. She indicated malaria is a major problem and part of the top ten diseases in the community. The centre has no laboratory and relies on other centres. There are ten outreach points within the community. She also mentioned that when cases are serious there is a transfer to the hospitals in the neighbouring towns.

**Atiteti November 10<sup>th</sup>, 2020.**

At Atiteti we announced our presence and introduced ourselves to some of the community members who gathered for an NDC campaign. We further had discussion with two gentlemen Mr Jacob and Mr. Simon who resettled from Fuveme to Attiteti. We were informed that there was pipe borne water for use in the community, most households don't have toilets. There are three herbalists in the town and two in Fuveme, people are being relocated from Fuveme because the sea is destroying the land hence the community. The people of Attiteti indulge in smoking of fish but not to a large scale. They have cases of flies being outside mostly during the mango season and also during the raining season because they like the cool areas.

**Anloga District Assembly - Environmental health and Sanitation office November 11<sup>th</sup>, 2020.**

We visited the Environmental health and Sanitation office and had a discussion with Mr Samuel Tettey the Director. The made mention of the towns Atiteti and Anyanyui formerly depended on wells for water but has pipe borne water now in the two towns with Fuveme being excluded. He also said because of poverty the people don't see the need to construct household toilets, this was so because formerly the people avoided obtaining permits for building their

houses. He said about 20% of the households have toilets and the Guest house Meet me there has contributed by helping the locals in Anyanyui and Dzita to build household toilets as compensation for the land used by the guest house. He also rated the hygiene practice to be between 30% to 40%. There are frequent visits from the district and education has lead to the change of mindsets in this towns.

He also mentioned the organisation CLTS helps to construct toilets for households in the upper part of the district like Akatsi, Azame areas and also in Shime areas. The types of toilets available are water closets plus septic tanks, ventilated improved pits (VIP) and Kumasi Ventilated improved pits (KVIP). People are use the biodigesters, there are training for building this toilets and people use it because it requires small amount of water, from January to November 2020 there have been a total of 2,174 construction of household toilets, there about 20,663 households in Anloga. He stated that most chiefs don't contribute much to the development and livelihood of the people because some don't live in the areas and some are government workers. He said some people use chemicals for fishing and in the far sea the people who engage in such acts come from Ada and settle in the Keta to fish.



Fig. 4 interaction with Mr Jacob at Attiteti.

He spoke about the meat production by the locals, normally poultry and goat consumption are at the house level and not produced for sale. He said diarrhoea is a season problem, the assembly has employed Zoomlion to provide the districts with containers for the dumping of the rubbish, and every district should have eleven (11) containers. There is education on vectors

of diseases and the progress is about 50%, some people use the mosquito nets for catching birds.

### **Ghana Health Service Directorate- Anloga Municipal Assembly, November 11<sup>th</sup>, 2020.**

We met the officers at the Ghana Health Service Directorate they indicated that for the past six months the cases of diarrhoea has reduced and it could have been due to sensitization about Covid-19. In 2014-15 there was a UNDP project that is the Oral rehydration therapy corners that was in the communities to help combat diarrhoea in children and affected persons. The assembly has a policy against building of public toilets. Guest house called Meet me there supports residents by encouraging them to pay GhC 200 for building of toilets. The health seeking behaviour of the people of the Anloga district are positive because they are ready to learn and accept interventions. Dudede is ceremony held on 31<sup>st</sup> December of every year and it is encouraged during this period for people to clean their surrounding and dump it into the sea. Reported cases on diarrhoea are can be found at the facilities. Rotavirus vaccination are given to children below five years old and this has lead to the reduction of diarrhoea prevalence. The behaviour of the indigenous people also affects the maintenance of washing hands properly

### **NADMO – Anloga Municipal Assembly, November 11<sup>th</sup>, 2020**

At the NADMO office we met some officers and they made mention of the fact that the district supports the organisation with food items and mosquito nets. They also mentioned that there is flash flooding in the shime and Anloga area. There are no wash systems in place. There is a task force formed with Health directorate to help sensitize the public on disaster prevention measures. They also spoke about how Direct heat or increase of heat can lead to crop failure, they also mention the change in rainfall pattern and how it is affecting farmers and fishermen. There are disaster volunteers in all communities in the district. Less than 10% of the district budget goes to NADMO, NADMO is less equipped, there is a disaster management committee which NADMO is a member. There is a collaboration between NADMO, police service and the ambulance. There are quarterly reports provided, meetings and workshops for training.

### **Conclusion**

In all, the trip was successful. A good rapport was established with stakeholders and information needed on all sites was collected. In places where information could not be confirmed, contact numbers were also taken

## **WORK PACKAGE 3**

### ***WEST COAST***

The West Coast team visited Opetekwei, in the Ablekuma West Municipal Assembly (05°31.521' N and 000°16.480' W) on Saturday, November 7, 2020. The project team had a brief meeting with the key leaders in the community, where the aim of the project and purpose of the visit was communicated to them. This was followed by an interview with specific stakeholders of interest for each work package. Key stakeholders present include; a Pharmacist, Assembly man, Opinion leader, youth representatives and Okyeame of Mpoase. The team later had some interactions with the community members. On Monday, November 9, 2020, the team visited the Municipal Assembly to interact with some key officials. They include; NADMO officer, Municipal Health Directorate officials, the planning officer and the Environmental Officer.

### **Response from interview**

1. The community is divided into two; the estate and the slum
2. Diarrhoea is mostly common when it rains. Heavy rains cause flooding which is as a result of waste being dumped in the lagoon.
3. One private clinic present, no government hospital in the community.
4. Lagoon and drains in the community serve as a dumping site for other communities. Informal waste collection system used in the community.
5. The pharmacist suggests a police post be put up to prevent the informal waste collectors from dumping into the lagoon and drains.
6. The leaders suggested the District Assembly acts quickly to stop people from dumping waste into the drains and lagoon.
7. Most homes do not have toilet facilities so use the public toilets in the community. Others ease themselves into gutters. There is also one modern toilet facility (biogas).

## **Interaction with community**

1. Opetekwei is a low-lying community hence floods easily when there is a heavy downpour. As a result of improper planning of the community, house have been built in waterways which contributes to the flooding in the community.
2. The community has two main waste collection skips. Due to the limited number of skips, community members tend to dump waste in gutters and along the streets which is contributing greatly to the flooding in the community.
3. The main of drinking water is water stored in tanks and water from wells.
4. The water marks on the walls shows that flooding is very evident.



Figure 1: Flooding in Opetekwei, days after a rainfall.



Figure 2: A well for a household



Figure 3: Waste skips in Opetekwei

### **Interaction with the Municipal Assembly Officers**

Mr. Daniel Tetteh, the Disease Control Officer, indicated that, there are no data on diarrhoea cases for Opetekwei due to the absence of a hospital in the community, hence it will be difficult to secure diarrhoea data for Opetekwei. He suggested, the team checks Korle-bu hospital.

### **MUMFORD**

The West Coast team visited Mumford ( $05^{\circ}.15.653'$  N and  $000^{\circ}45.373'$  W), a fishing community in the Gomoa West District in the Central region. The team visited the Gomoa West District Assembly and the Mumford community to interact with key stakeholders and the community members. The team had a brief meeting with the key leaders in the community, where the aim of the project and purpose of the visit was communicated to them. This was followed by an interview with specific stakeholders of interest for each work package. Key stakeholders present included; a nurse, Assembly man, Opinion leaders, youth representatives, unit committee members and fish mongers. The team later had some interactions with the community members.

The team later proceeded to the district assembly and interviewed the Planning officer, NADMO director and the Environmental health officer.

## **Response from interview**

1. The most common disease in Mumford is Malaria, however, cholera cases are recorded sometimes.
2. They experience diarrhoea cases mostly when it rains and when they experience large harvest of their produce.
3. The main source of water for the community is pipe water from water tankers. During the dry season, the pipe water taste salty. During the rainy season, the community people prefer to collect rain water rather than buy water from tankers in order to save some money.
4. Majority of the natural sources of water has been polluted with waste.
5. The community has 5 waste skips managed by the zoomlion from the district council. It was reported that, these waste skips are not emptied often which could be contributing to the diarrhoea cases in the community. The elders of the town have also designated some other areas for dumping of refuse. Town folks are expected to pay before dumping waste into the skips. Some community members resort to dumping waste into drainages and along the streets because of the fees charged at the dumping sites.
6. There are 4 public toilets managed by the area council. However, open defecation is still practiced along the sea.
7. The community has one chip compound and one health centre.
8. They reiterated the need for the additional waste skips at not cost for dumping of waste and also the need for an information car for announcement and educating the people in the community.
9. The NADMO director mentioned that, it will be difficult to secure diarrhoea data for the of length time the team is requesting for. However, they will try to get the team data from 2010/2011.



Figure 4: Waste skip in Mumford



Figure 5: Designated dumpsite in Mumford.

## **CONCLUSION**

It was a very insightful and successful trip. The community leaders, members and Assembly officials were very ready to participate in the project.

## *EAST COAST*

### *Day 1. 8<sup>th</sup> November, 2020. (Anyako Community)*

- The project team joined a number of churches, Catholic, EP, Global Evangelical for church service. The PI took some few minutes to introduce the project to the congregation.
- In the afternoon, the project team had a meeting with the community people organized by the assemblyman. Some of the issues that were brought to light from the discussion include:
  - Method of fishing activities that is causing tensions amongst the people
  - Low yields of their fishing, with some arguing it is linked to the poor fishing practices employed
- In the same meeting, we tested the interview guide with the **QUEEN MOTHER (MAMA KUKUE IV)** and noted at the end of the interaction that the tool needed to be revised. Findings from our talk indicated the following:
  - Diarrhoea is not common in the community and even when they have cases it is as a result of their unclean surroundings
  - When people are caught defecating along the beaches they are arrested. It is difficult to catch them because they go early in the morning
  - In the past she would organize the women in the morning to sweep along the lagoon and burn the rubbish, however, due to her physical limitations she doesn't do that anymore.
  - They do not experience flooding. She does not believe there is any relationship between diarrhoea and flooding, anybody can get it.
  - She is not aware of the concept "Climate Change".
  - Nurses frequently do education on diarrhoea and sanitation.
  - She has great influence over the women in the community as they consult her whenever they have issues.
  - She does not have any interactions with the District Assembly only the chief.

- Nobody sells traditional medicine there but people bring from outside. They announce their presence at the information centre and people go there to buy it
- Not aware if fetish priests cure diarrhoea as well
- Most youth either learn a trade or leave Anyako for bigger towns.
- Few occupations exist here: drivers, fishermen, kente weaving
- Some women also engage in fishing by themselves or with their husbands

We tested the interview with a community woman in her house. (Decided to revise some of the questions).



Figure 1 Lagoon area where open defecation occurs



Figure 2: The road that leads to Anyako

***Day 2. 9<sup>th</sup> November, 2020: Anyako health centre, Keta Municipal Assembly, Nadmo***

Our first visit was at the Anyako health centre. Our chat revealed:

- There are few cases of diarrhoea recorded per month (about 10)
- There is no resident pharmacist/dispensary
- There is the issue of diarrhoea data prior to 2014 with most health facilities getting rid of them because of space
- They engage in outreach to educate the people especially on open defecation
- Patronage of the centre is low, people's first point of call is OTM till the case becomes severe. Decline in numbers was as a result of the transferal of the physician assistant. People would be referred because of the absence of the PA therefore they would not bother coming.
- Challenges in medical supplies is nationwide but currently they have enough stock (regional store from Ho supplies them).
- Majority of the drugs are covered by the NHIS so patients do not pay.
- Most of the diagnosed cases are typhoid fever.

- It is not true that the saltiness of the water can kill the diarrhoea causing bacteria and plans are advanced to carry out awareness creation activities to change that mindset (PI indicated this should be a researchable area)



Figure 3: Anyako Health centre

### **KETA MUNICIPAL ASSEMBLY**

Our second stop for the day was at the NADMO office of the Keta Municipal Assembly where we had a conversation with the officers concerning how NADMO reacts to flooding issues as well as how they are able to engage communities within the assembly particularly Anyarko. These are some of the issues that came from the discussion.

- NADMO is not supported by the Assembly to undertake Climate Change projects (there is no budget line). NADMO does not receive pre-disaster support.
- Flooding is an issue in the Anloga District: Atievi, area
- Anyarko case is quite different: they have water issues, water is salty, cannot drill boreholes, one road leads there
- There are zonal staff working in Anyarko and they engage the community quite often.
- Anyarko residents are used to the flood conditions there. There is no detailed strategy to deal with the flood in Anyarko

- **With respect to sensitization from Nadmo:** they give limited advice such as not building on the waterway, however, that is difficult since land is scarce there
- They try to reclaim the land by dumping refuse along the lagoon
- It has been difficult getting information from Ministry of health
- NADMO public education activities; they collaborate with fire service, health admin
- NADMO does radio education in collaboration with NCCE on Jubilee radio (106.9fm) and SunCity radio (88.9fm). During the dry and rainy seasons, there are programs that are run to address issues that may come up (bush fires and flooding)
- Currently they have 9 staff working from Keta
- NADMO visited 5 SHS to educate on disasters
- They tried to establish disaster volunteer groups. There are community groups in Anyarko but they are dormant because they demand some incentive
- Anyanui is asking for sea defence
- **Resettle issues to be considered:** people are not ready to relocate, especially fishermen
- There are land issues in Fuveme, land ownership and other land tenure makes it difficult to support the resettlement processes.

## **SOCIAL WELFARE AND COMMUNITY DEVELOPMENT**

**MANDATE: support the vulnerable and needy groups (the aged, persons with disability, HIV, TB)**

- Grants were coming to support these groups but are not coming anymore
- There are only 2 staff in the office, usually handle divorce and child custody cases, however, refer criminal cases to DOVSU and deal with the civil cases
- The Poverty map determines beneficiaries, currently 1800 households benefit, 700 in Keta
- Criteria for selection: should have urban poor people.

**CONTACT NUMBERS**

Celestina Attipoe(Community Development): 0208166286/0547173591

Faustina Borkloe (Social Welfare): 0554229115/0208960858

**KETA MUNICIPAL HEALTH DIRECTORATE**

- There is no water at Anyarko. They transport it from Abor. Poor households depend on wells and rain harvesting
- They fish and practice open defecation at the lagoon sites
- Waste is dumped by the water to reclaim the land, when it is level then they build
- The Assembly is aware in dealing with water. The MCE has been briefed about the issue.
- They sensitize them on treating the water well before use
- Diarrhoea and cholera cases have reduced since early 2000s (surveillance system indicators)
- Cases recorded are seasonal (rainy season)
- People are used to open defecation
- Since land is scarce, they build storey buildings.
- Often organize durbars and open forums to discuss issues.
- Jubilee radio (Weekly radio programs) – 3 information centres (privately owned)
- Durbar organized by funds from (MCHIP) – world bank grant for 5 years
- Anyarko Assemblyman contributes a lot
- NHIS—not paying on time
- They do not generate IGF
- Anyarko is under Anyarko sub district

- A number of NGOs they work with include: Right to play, health keepers, Marie stopes (stopped now), seek to save (TB), others come around when there are programs to be implemented.
- Carry out awareness creation activities.
- COVID protocols has added to the decline in diarrhoea cases, handwashing consistently
- Vaccination for children under 5 with the Rhotavar from Rhotarix to protect children from diarrhoea has helped reduce cases
- Idol worshippers had issues with health directorate initially because they were against immunization but communities are now accepting efforts as a result of continuous education
- Diarrhoea data is still a challenge (an officer promised to do some checking to see if he could get more data for us)

#### **CONTACT NUMBERS**

Letsa Sefam (Health information): 0242067095: [letsaagbozas@gmail.com](mailto:letsaagbozas@gmail.com)

Genevieve (Public health):0247279015

Saint Raymond (HR): 0243574005)

Judith Amutti Sefakor: 0244960906

Dora (Health promotion): 0207950980/0243669339

#### ***Day 3. 10<sup>th</sup> November, 2020: Anyanui and Atiteti***

The project team visited The Anyanui health centre and had a conversation with the midwife. The physician assistant was not available. This is what ensued during the dialogue.

- Diarrhoea cases have reduced and over the past 12 months there has not been any serious outbreak.
- Previously the health centre could not treat certain cases such as typhoid and had to refer them to Keta hospital because they did not have a resident physician assistant.

- Malaria is the main issue in Anyanui. This could be attributed to the proximity to the sea, residents usually like to sit outside for fresh air and end up get bitten. There are also little bushes and paddles of water that breed mosquitos. The health centre educated the people on the use of mosquito nets and repellents etc. Such educational campaigns are done through durbars and home visits.
- There are community volunteers that help in educational programs but can only be paid when these programs are funded from the national level.
- There are 10 outreach points within the Anyanui community and once a month nursing mothers are reached
- One major problem is the deficit in staff, absence of a laboratory which means more referrals (as a result most patients decide not to go and return when their ailment worsens) insufficient equipment such as delivery beds (proximity to the sea leads to rust therefore needs to be constantly replaced)
- During the rainy season there is a lot of poor hygiene and the effects of open defecation become more visible
- Sources of water in the community include: wells (most homes have this)

**CONTACT NUMBERS**

GIFTY DANSOA (MIDWIFE): 0248186079

CHRIS (PHYSICIAN ASSISTANT): 0548693304

The project team also had a meeting with some sections of the community where the PI again introduced the team and the project goals and objectives. The questionnaire was tested on a woman in this community and interactions indicated some of the questions need to be revised. A short interview followed with an opinion leader, a fetish priest in the community. These were some of his comments.

- Unfamiliar with the term, “Climate change” but has noticed a change in weather patterns, with rainfall reducing. Being a farmer as well he fetches water from a well to irrigate his farm (he has 3 workers)

- Most of the youth are unemployed.
- As a result of this “Fetish priest” role he knows a number of influential people and is in constant touch with the chief, elders, assemblymen, the Member of Parliament of the constituency and a few others
- He was instrumental in convincing the MP to bring the LEAP initiative to the community
- The MP supplies him tomato seeds but now wants to buy it himself directly from the source
- The youth need to learn some sort of trade and get capital to set up businesses since most of them are leaving to bigger towns.

**CONTACT NUMBER**

Hunor Sena (Fetish Priest): 0593196837

We could not meet the Anyanui community as a “political rally was ongoing”. Below are some pictures of the lagoon.



Figure 4: Anyanui lagoon shoreline



Figure 5: Keta lagoon Ramsar site

*Day 4. 11<sup>th</sup> November, 2020: Anloga District assembly, Nadmo, environmental health unit, district health directorate.*

The Anloga District Assembly was inaugurated in February, 2019. We spoke to the Environmental Health Unit Director.

- GWCL is efficient. Anyanui has water. Fuvume does not have water because of the sea.
- There are not many boreholes.( verify)
- People do not see the need to construct household toilets, they prefer outdoor, open defecation. Why use money for toilet when they can use it for other things.
- Although there is a National policy requires you to have toilets in your house (20 % of houses have toilets) \_\_
- A Guesthouse named **“MEET ME THERE”** started an initiative between Djita, Agbenuta to support households in acquiring their own toilets. They only pay GHS100.00 compensation for the land they use. The Assembly is trying to extend that.
- Some NGOs are charging people to construct biofills and biodigester which uses less water

- Areas such as **Shimer** (in the North) are benefiting. (Ho and Jasekan, very popular). In the past, Danida tried to help them to construct but people could not afford 50% of the cost.
- Rates the hygienic practices 30-40%, attitudes are changing over the years.
- The residents use local materials to construct toilets (sandy area) however, it is not suitable because of the soil.
- Some houses have WCs —use septic tank. They have water to flush, have VIPs.
- Role of chiefs in development issues (sanitation issues): non-existent, they do not do much. Chiefs reluctant to cooperate because they feel interventions are imposed on them. Some chiefs are not also in the town, they reside in Accra or live far away from the town.
- Youth commitment (do not participate) : migrating to the cities
- Since Anyanui and Atiteti are fishing communities most of their challenges are issues relating to fishing (using chemicals, deep sea to pull the fish out). They have a difficulty in getting access to outboard motors. There is a high demand for the fish.
- Most of their activities goes towards health preventive
- Strategic plans from Keta and Anloga District
- Diarrhoea is usually recorded during the rainy season.
- Siting toilets needs supervision of environmental health officers (have data on toilet constructions): household toilets: 1174
- Staff strength of Environmental health unit: 7 area councils. There are at least 2 environmental health and sanitation officers. They don't have offices. They are stationed in the area.
- Zoomlion is in charge of waste disposal (once a week)
- Zoomlion: has 11 skips in the districts but Anloga is huge.
- Current policy is moving from public toilets, politicians constructing VIPs for votes
- There are 20663 households in Anloga (2010).



- Work closely with environmental health unit for educational campaigns whenever there are disasters.

### **NADMO EDUCATION ACTIVITIES**

- Government agencies typically work with include; forestry commission: their message is promoting afforestation. They have in their action plan to plant mangroves at Anyanui
- Flash floods normally occur at Shimer
- There are disaster volunteers, but need to speak to zonal officers who are responsible for the zones

### **NADMO VOLUNTEER SYSTEM**

- Main focus is to train and equip volunteers, mandate: report cases of disaster
- Have challenges supporting Fuvume coastal erosion victims, can only put up temporal structures
- NADMO has no vehicles so uses the DAs offices, use motors so impedes their access to certain areas
- Dire shortage of office logistics
- Less than 10% of the District budget goes into Anloga NADMO activities
- They do not have a store nor relief items available, not well resourced
- NADMO works with some NGOs, their committee is comprised of the fire service, health service, ambulance, police (Disaster Management Committee)
- NADMO operates from the National, Regional and District level. Quarterly meetings and workshops are held at the regional level to discuss reports

### **ANLOGA HEALTH DIRECTORATE**

- This is a new team that is still getting to know the community.

- Gaps in health data specifically diarrhoea still a challenge.
- There are six health centres, 3 CHIPs, 3 private clinics, 2 maternity (1 functional)
- Diarrhoea cases are not consistent, past 6 months (on the decline) can be attributed to new under 5 Rotavirus, diarrhoea vaccine. Also initiatives by the assemblyman in terms of more education helping to bring the numbers down.
- Health promotion and education and COVID-19 protocols on hygienic measures, might have contributed to decline in cases.
- Collaboration with OTMC to access health data records ,e.g. TB, cough, contraceptive use, diarrhoea (not sure)
- UNDP project on climate change adaptation 2014/2015, set up Oral Rehabilitation Therapy corners, chemical sellers were brought to be sending diarrhoea data to the hospital but this stopped when the project came to an end (PI requested for this data)
- Yenui, in Anloga is suffering with filth problems, engaged with clean-up activities and advocacy efforts
- They work closely with Environmental health unit and Zoomlion to strategize and deal with the issues in the communities in a holistic manner.
- People still believe in public toilets, they don't want to build their own toilets
- "If you have a kitchen why don't you have a toilet"
- A guesthouse supported Dzita (**Meet me there**) to build climate friendly toilets (made from sawdust) paying a small token (has been recommended to the DCE). They also provided tippy taps all over the community which encouraged people to wash their hands as free soap was given.
- Indigenous culture not impeding education efforts
- Have traditional customs that promote hygiene: they will not enter their houses without washing hands
- Health seeking behaviors is high here, people are receptive here
- Beating the gongong (d)d)d3d3), compulsory sweeping done on 31<sup>st</sup> December and before Hogbetsotso.. DCE gave money to perform these rites.

## CONCLUSION

- Questionnaires should be revised, reduce the number of questions, not more than 20. Some of the questions need to be removed as well
- Semi-structured questions need to be revised as well.
- Should leverage on the stakeholder list we have generated and tailor the questions to them.
- We should also liaise with WP1 to get a drone capture of the entire Anyarko community to have a clearer layout of the place (Dr Boafo did a transect walk to have an idea of the area)

## **WORK PACKAGE 4**

### ***EAST COAST***

#### **Introduction**

In view of the objective of this visit, and in order to meet the specific stakeholder dynamics, the approach and strategies for engagement was slightly different in each of the three communities - Anyako, Anyanui, Atiteti – visited. For example, based on prior information from the previous engagement with the community leaders of Anyako, the team adopted a two-prong approach – visits to major churches in the Community and a Community Durbar, which were carried out on Sunday with the objective of reaching out to a majority of community members. The research team (divided into smaller groups of 3-4 members), during their visit to the churches who were previously informed via a letter through the Assemblyman, spent some time worshipping with them and used the opportunity to inform the congregants of the C2R-CD research in the community. Beyond the public announcements that were caused to be made in the community, the team used the opportunity to invite all congregants to the main Community Durbar which was held at 2pm in the Church Auditorium of the Evangelical Presbyterian Church, Anyako.

At the Community durbars which were attended by all community members and in particular, identifiable livelihood and community leaders such as farmers, fishermen, youth, opinion leaders and traditional leaders, the team reiterated the objectives of the C2R-CD research and the role the communities in supporting the process. There were open discussions on some preliminary issues of relevance to the research and general discussions on the views of the community on climate change and diarrhoeal issues, sample work package-based questionnaires were also administered to appropriate respondents after the durbars to test the appropriateness of the instruments. Transect walks were undertaken to identify the locations of all significant facilities and infrastructure in each community. At Assemblies, the team met and held brief discussions with officials of the various units such as the District Assembly offices of the National Disaster Management Organisation (NADMO), District Health Offices (DHO),

Gender Department, Department of Agriculture (DoA) among others. The specifics of the activities undertaken during the visit are highlighted below:

### **Highlights of Community Durbar - Anyako**

The team arrived at Anyako on Saturday evening ahead of the community activities on Sunday, November 8. As highlighted earlier, team members of smaller groups visited each of the major Churches in the Anyako town including the Catholic, Presbyterian, Pentecost and the Global Evangelical Churches to briefly introduce the C2R-CD project and invite members to the Community Durbar, held in the afternoon at 2pm in the auditorium of the Evangelical Presbyterian Church, Anyako.

The durbar was attended by members of the community including the Queen Mother and other representatives of traditional leaders, opinion leaders, fishermen, farmers, youth etc. The Assemblyman who was very instrumental in organising the meeting arranged for one of the opinion leaders of the Community to chair the meeting since he (Assemblyman) could not participate throughout the meeting due to other equally pressing engagements.

With the Chairman in place, the team was welcomed and given the opportunity to start the interactions. Dr. Dzidzo Yirenya-Tawiah, the PI of C2R-CD and team lead took the stage to explain to the community our objectives of C2R-CD and our visit to the community, noting that the research was being carried out in other coastal communities across three regions. She open the discussions by finding out from the community about the issues of climatic change impacts on their livelihoods and health – specifically with respect to diarrhoeal diseases and among children. While the community members generally agree to the facts of a changing climate including rainfall, flood occurrences, flow regime of the lagoon, decline fish catch and a declining diarrhoeal incidence which they attribute mainly to increased awareness and the role of health workers, they noted a number of other factors that influence the situations of the community to include:

- Lack of potable water in the community remains a challenge. Open defecation and dumping of along the shores of the lagoon continues to persist, a major contributory factor to

diarrhoea. The community notes that diarrhoeal cases are referred to the hospitals and or over the counter medicine sellers and they rarely rely on traditional medicine or self-medication.

- They also noted that due to the lack of space (land), there are limited public toilets in the community. In addition, the practice of reclaiming land from the lagoon using waste filling continues and poses potential threat to public health in the community.
- With respect to agricultural activities, it was noted that high soil salinity and lack of land are major challenges in the community beyond the issue of erratic rainfall. Regarding declining fish landings and reduced diversity of catch, the fishers noted a number of factors may have contributed to the phenomenon. They noted that increased human population and fishing pressure as one of the factors and suggested a possible close season for the lagoon. Additionally, they were of the view that the construction of the Akosombo dam has led to a great reduction in the water that flows to its floodplain and hence the adjoining streams that link the floodplain to the Keta Lagoon Complex. As a result, the annual flooding of the plains that results in the input of nutrients into the streams and hence the lagoon system as such curtailing the influx of a variety of fish species into the lagoon. Additionally, the fishers indicated that the authorities no longer open the sea defence gauges between the sea and the lagoon in Keta, hence brackish water and marine species such as shrimps no longer get access into the lagoons for fishermen to harvest. Again, the increased shallowness of the lagoon coupled with salt water intrusion from the sea makes it extremely salty for many of the brackish water species.
- Officials of the Anyako Health Centre at Anyako-Kpota corroborated the community observation on the declining levels of diarrhoeal cases and noted that most of the cases come to the centre or are referred to bigger hospitals.

**Selected Photos:** *Anyako Community Interactions*



*A segment of the lagoon with the Anyako Community in the background*



*Team at the Catholic Church prior to the Durbar*



*Interactions at the Anyako Health Centre,*

### **Keta Municipal Assembly (KeMA) Offices, Keta**

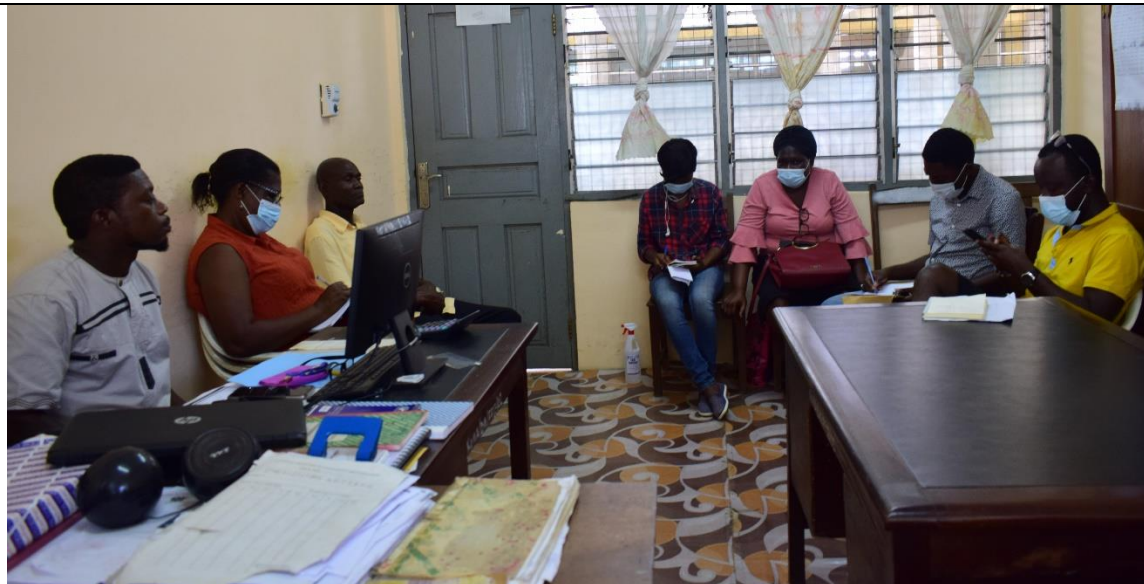
At the Municipal Assembly, the teams met officials according to the various work packages to discuss preliminary issues. In an interaction with officials of Municipal National Disaster Management Organisation (NADMO), it was revealed that there was some level of lack of coordination between the various units of the Assembly. Specific reference was made to the lack of coordination between the NADMO and the Municipal Health Office (MHO) making it difficult for the NADMO officials in some cases to obtain essential information such as diarrhoeal prevalence and incidence cases to aid their action.

The discussions also indicated that flooding is one of the major issues in the municipality, particularly with reference to Anyako. But the officials were quick to add that, in their case, they are unable to do much due to budgetary constraints and for communities like Anyako, their location makes flooding an annual event and their form of intervention which is mainly the provision of relief items plays no significant role. However, they have consistently worked on educating them on how to continue to improve their resilience to the flood issues particularly

in view of the lack of space (land) in the community for the effective provision of infrastructure such as public toilets among others.

Regarding the issues of community level disaster management, the officials noted that NADMO has one zonal staff stationed at Anyako and responsible for a number of surrounding communities. They also indicated that the Community Disaster Volunteer Groups that were set up in the various communities have become dormant, mainly in their view due to the lack of remuneration (as many associate volunteering with the expectations of monetary benefits).

**Selected Photos:** *Keta Municipal Assembly – Volta Region*



*Interactions with Municipal NADMO Officials, Keta Municipal Assembly, Keta*

**Keta Municipal Health Office, Keta**

Though the team did not meet the Municipal Health Officer in person, arrangements were made to interact with other officials of the Unit among which include the Community Health Officer. They also noted that a number of disease conditions linked to sanitation including diarrhoeal cases have declined largely due to the efforts of health officials, including vaccination efforts and the awareness among members of the various communities for improved sanitation. With respect to areas such as Anyako, the health officials acknowledged the unique challenges of the community in terms of lack of potable water, lack of communal places of convenience, open defecation and persistent flooding. They noted however that there are health personnel

stationed in the community and this has helped largely with community sensitisation. They noted that the MHO carry out regular (quarterly) community sensitisation activities aimed at health promotion. Some of these activities are done in conjunction with other health related organisations including the media.

On the issue of the availability of diarrhoeal data, the office was of the view that recent case records are available in the DIMS 2 database, however, older records are difficult to trace or even if they are available may be in the hard copy at the various health units. They indicated that as part of the data/record management protocols, records of ten years or more are usually discarded. They however, assured the team that all would be done to provide as much information as they could obtain for the use of the C2R-CD Team.

**Selected Photo:** *Keta Municipal Health Office, Keta*



## **Anloga District**

### **Anyanui Community Durbar– Anyanui**

The meeting with the opinion leaders and representatives of identifiable groups in Anyanui was held at the E. P. Basic School compound. The groups represented at the meeting include the Youth, farmers, mangrove planters, fishermen, and fishmongers, traders and Traditional leadership and the Assemblyman for the Electoral area. The team also visited the Anyanui Health Centre to hold discussions with the health officials on the issues of diarrhoeal diseases. Notably, Anyanui has access to potable water, a market, a public toilet among others.

- During the open discussions following the briefing on the research, the community reiterated their experiences with the impacts associated with climate change as manifested in limited rainfall, crop failures among others. They particularly noted that the rainfall is currently limited, as such they are unable to plant some of the crops they used to cultivate because they rains do not fall enough to enough adequate moisture of the soil as essential for the crops. Some members of the team, during the transect walk visited a tomato farm belonging to a member of the community to witness how the field had wilted despite the efforts of the farmer in watering the crops owing to the intense heat.
- Regarding other disasters, the community noted that flooding from rainfall has not been a major issue for a long time.
- They reiterated the need for the construction of additional public toilets to help prevent diarrhoeal diseases and appealed to the team for help. To this the PI indicated that the role of the research project would be to highlight the issues of the various communities to stakeholders based on the evidence gathered from the research but cannot directly provide those amenities.

**Selected Photos:** *Anyanui Community Interactions*



### **Atiteti Community Durbar – Atiteti**

The interactions at Atiteti which took place at the Community's Basic School was very brief as it coincided with a political rally. However, the objective of the visit was communicated to the gathering. Following the address of the community, the team had an extended interaction with two members from the adjoining community of Fuveme as a result of which the team is of the view that the C2R-CD research be extended to include the Fuveme community in view of the vulnerabilities they are exposed to.

**Selected Photos:** *Atiteti Interactions*



### **Key Actions**

- Each of the PhD Students to write a paper for publication focused on environmental challenges in the study areas
- The team to consider studying the relationship between water type (saline lagoon water), the causative organisms and incidence of diarrhoea in reference to the prevailing conditions in Anyako.

## APPENDIX

### *WEST COAST*

#### CHECKLIST FOR OPETEKWEI

**COMMUNITY NAME:** Opetekewi, Ablekuma West, Greater Accra

| <b>STAKEHOLDERS</b>   |   |            |                        |                |   |                        |                                      |                |             |   |
|---|---|------------|------------------------|----------------|---|------------------------|--------------------------------------|----------------|-------------|---|
| <p><i>List all stakeholders (institutions/individuals and organisations they belong to. Indicate role/position in parenthesis) eg. Mr KKK, GHS, District Director</i></p> <p>...Nii Adotei Kasa I, Chief, Opetekwei</p> <p>...Andrews Samini, Assemblyman, Opetekwei</p> <p>...Susana Azantinlow, Women’s Advocate</p> <p>....Alvin Arthur, Unit Committee Chairman</p> <p>...Grace Quansah, Community Health Volunteer</p> <p>...Mr. John Solaga, GHS, Municipal Health Information Officer.....</p> <p>...Mr Daniel Tetteh, GHS, Municipal Disease Control Officer</p> <p>...Samuel Tete, Environmental Health Officer ...</p> <p>.....</p>   |   |            |                        |                |   |                        |                                      |                |             |   |
| <p><i>What do you need from each of them?</i></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%; padding: 5px;">Institution/individual</th> <th style="width: 60%; padding: 5px;">What is needed</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">Nii Adotei Kasa I<br/>Andrews Samini<br/>Susana Azantinlow<br/>Alvin Arthur<br/>Grace Quansah</td> <td style="padding: 5px; vertical-align: middle;">Community mobilization</td> </tr> <tr> <td style="padding: 5px;">Mr. John Solaga,<br/>Mr Daniel Tetteh</td> <td style="padding: 5px; vertical-align: middle;">Diarrhoea data</td> </tr> <tr> <td style="padding: 5px;">Samuel Tete</td> <td style="padding: 5px; vertical-align: middle;">Community sanitation and waste management</td> </tr> </tbody> </table> |   |            | Institution/individual | What is needed | Nii Adotei Kasa I<br>Andrews Samini<br>Susana Azantinlow<br>Alvin Arthur<br>Grace Quansah | Community mobilization | Mr. John Solaga,<br>Mr Daniel Tetteh | Diarrhoea data | Samuel Tete | Community sanitation and waste management |
| Institution/individual  | What is needed                            |            |                        |                |   |                        |                                      |                |             |   |
| Nii Adotei Kasa I<br>Andrews Samini<br>Susana Azantinlow<br>Alvin Arthur<br>Grace Quansah   | Community mobilization                    |            |                        |                |   |                        |                                      |                |             |   |
| Mr. John Solaga,<br>Mr Daniel Tetteh  | Diarrhoea data                            |            |                        |                |   |                        |                                      |                |             |   |
| Samuel Tete   | Community sanitation and waste management |            |                        |                |   |                        |                                      |                |             |   |
| <p><i>Names and contacts of stakeholders</i></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 35%; padding: 5px;">Name</th> <th style="width: 35%; padding: 5px;">Institution</th> <th style="width: 30%; padding: 5px;">Contact</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">Nii Adotei Kasa I</td> <td style="padding: 5px;">Community</td> <td style="padding: 5px;">0542126228</td> </tr> </tbody> </table>  |   |            | Name                   | Institution    | Contact   | Nii Adotei Kasa I      | Community                            | 0542126228     |             |   |
| Name  | Institution                               | Contact    |                        |                |   |                        |                                      |                |             |   |
| Nii Adotei Kasa I   | Community                                 | 0542126228 |                        |                |   |                        |                                      |                |             |   |

|                   |                    |            |
|-------------------|--------------------|------------|
| Andrews Samini    | Community          | 0244659746 |
| Susana Azantinlow | Community          | 0244586286 |
| Alvin Arthur      | Community          | 0243965105 |
| Grace Quansah     | Community          | 0552875640 |
| John Solaga,      | GHS                | 0208189592 |
| Daniel Tetteh     | GHS                | 0246715276 |
| Samuel Tete       | Municipal Assembly | 0549520872 |

**DIARRHOEA CASES**

**List all sources of diarrhoea data**

...DHIMS 2 (2012-Till date) .....

...Center for Health Information management Systems (CHIMS), Korle Bu might be able to provide some information on DHIMS 1.

Identify type of data, source and period available

| Type of data    | Location | Period (years) |
|-----------------|----------|----------------|
| Diarrhoea cases | DHIMS    | 2012-2020      |
|                 |          |                |

**WASH**

**Identify community WASH strutcures/systems and location**

- ...drains in the community not enough
- ...public access to pipe borne water
- ...inadequate toilet facilities (public toilets)
- ...single refuse container in entire community
- ...two private owned toilet facilities
- ...one public owned toilet facility
- ...well in individual households
- ...public water tanks

**Household**

what type of household settings do they have (heads/ caregivers etc)

.....Estate and Slum.....

**Water Storage Systems**

...community taps, pipes to homes, communal wells.....

...private individuals own poly tanks

...pipe borne water.....

...well...

...community storage tank.....

***Food storage systems***

.....

.....

.....

.....

.....

.....

***Identify household WASH systems***

...toilets in households (KVIPS)

...household refuse collected by tricycle

## CHECKLIST for Mumford

COMMUNITY NAME: Mumford

| STAKEHOLDERS   |                  |            |
|--|------------------|------------|
| <i>List all stakeholders (institutions/individuals and organisations they belong to. Indicate role/position in parenthesis) eg. Mr KKK, GHS, District Director</i> |                  |            |
| ...Millicent Ekua Hanson, Chemical Seller, Mumford   |                  |            |
| ...Mr. Isaac Asuma Addision, Director, NADMO   |                  |            |
| ...Mr. Elliot Nortey, Zonal Coordinator, NADMO   |                  |            |
| ...Sekina Jaafar, Adminstartaor, NADMO   |                  |            |
| ...Cletus Bayor, Director, District Health Directorate   |                  |            |
| ... Simon Yao Agordo, Environmental Health Officer,  |                  |            |
| ...Gilbert Buabeng Yankson, Principal Environmental Officer  |                  |            |
| ...Enoch Wilson, Youth Leader, Mumford   |                  |            |
| Louisa Annan, Mumford H/C, health Information in-charge at Health center   |                  |            |
| ...Enoch Somiah, Mumford CHPS  |                  |            |
| <i>What do you need from each of them?</i>   |                  |            |
| Institution/individual   | What is needed   |            |
| Millicent E. Hanson  | OTCMS            |            |
| Enoch Somiah   | Diarrhoea data   |            |
| Louisa Annan   |                  |            |
| Gilbert Buabeng Yankson  |                  |            |
| Cletus Bayor   |                  |            |
| Simon Yao Agordo   | Sanitation       |            |
| Enoch Wilson   | Youth leader     |            |
|  |                  |            |
| <i>Names and contacts of stakeholders</i>  |                  |            |
| Name   | Institution      | Contact    |
| Millicent K. Hanson  | Chemical Seller  | 0559399325 |
| Enouch Wilson  | Youth            | 0246884662 |
| Louisa Annan   | GHS, Mumford H/C | 0543880084 |

|                         |                      |            |
|-------------------------|----------------------|------------|
| Enoch Somiah            | GHS, Mumford CHPS    | 0249614975 |
| Felicia Maisie          | Fishmonger           | 0241798865 |
| Simon Yao Agordo        | Environmental Health | 0246738472 |
| Gilbert Buabeng Yankson | Environmental Health | 0245016144 |
|                         |                      |            |

**DIARRHOEA CASES**

**List all sources of diarrhoea data**

...DHIMS 2 (2012-Till date) .....

.....Morbidity reporting forms .....

Identify type of data, source and period available

| Type of data   | Location      | Period (years) |
|----------------|---------------|----------------|
| Diarrhoea area | DHIMS in CHPS | 2012-2020      |
|                |               |                |
|                |               |                |
|                |               |                |
|                |               |                |
|                |               |                |

**WASH**

**Identify community WASH structures/systems and location**

Public toilets

Section of beach for open defecation

KVIP in very few households

Refuse containers

Refuse dumping sites...

**Household**

what type of household settings do they have (heads/ caregivers etc)

.....peri-urban area, mainly fish smoking, partly mud houses.....

**Water Storage Systems**

...concrete reservoirs for rain water

Poly tanks for pipe water

Standing pipes in households

***Food storage systems***

.....

.....

.....

.....

.....

.....

***Identify household WASH systems***

...few toilets in households (KVIPS)

gallons for water storage

## ***EAST COAST***

### **CHECKLIST FOR ANYAKO**

**COMMUNITY NAME: Anyako**

| <b>STAKEHOLDERS</b>   |                                     |                |
|---|-------------------------------------|----------------|
| <i>List all stakeholders (institutions/individuals and organisations they belong to. Indicate role/position in parenthesis) e.g. Mr KKK, GHS, District Director</i>   |                                     |                |
| <ol style="list-style-type: none"> <li>1. Celestine Aflakpui, community member</li> <li>2. Agnes Dzokotor, community member</li> <li>3. Catharine Djabatey, midwife, Anyako Health Centre</li> <li>4. Buama, Nurse, Anyako Health Centre</li> <li>5. Mr Blago, NADMO Coordinator</li> <li>6. Godfred Akakpo, Anyako zonal staff</li> <li>7. Dominic Kpodo NADMO Administrator- Keta Municipal Assembly</li> <li>8. Ayivor Mensah, Deputy director NADMO - Keta Municipal Assembly</li> <li>9. Godwin King-Nyamador – NADMO</li> <li>10. Dora Kugbonu (Health promotion Officer) Keta Municipal Health Directorate</li> <li>11. Letsa Sefam (Health information officer)- Keta Municipal Health Directorate</li> <li>12. Micheal Kyere (Disease control) – Keta Municipal Health Directorate</li> <li>13. Genevieve Amewoseanyenya (Nutrition officer) – Keta Municipal Health Directorate</li> <li>14. Edith Sefakor Amutti (Public health nurse) – Keta Municipal Health Directorate</li> <li>15. Saint Raymond – Keta Municipal Health Directorate</li> </ol> |                                     |                |
| <b><i>What do you need from each of them?</i></b>   |                                     |                |
| <b>Institution/individual</b>   | <b>What is needed</b>               |                |
| Celestine Aflakpui  | Dumping sites of waste              |                |
| Agnes Dzokotor  | Wash systems or stations            |                |
|   | Animal farms                        |                |
|   | Open defecation                     |                |
|   | Selected household with caregivers. |                |
| <b><i>Names and contacts of stakeholders</i></b>  |                                     |                |
| <b>Name</b>   | <b>Institution</b>                  | <b>Contact</b> |

|                          |                      |   |
|--------------------------|----------------------|---|
| Celestine Aflakpui       | Community            | 0242269583  |
| Agnes Dzokotor           | Community            | 0241185107  |
| Catharine Djabatey       | Anyako Health Centre | 0241224517  |
| Buama                    | Anyako Health Centre | 0246849049  |
| Godfred Akakpo           | NADMO                | 0242059673  |
| Dominic Kpodo            | NADMO                | 0242120481  |
| Ayivor Mensah            | NADMO                | 0249590670  |
| Godwin King-Nyamador     | NADMO                | 0540547801  |
| Dora Kugbonu             | K. M. H. D           | 0207950980,<br>0243669339   |
| Letsa Sefam              | K. M. H. D           | 0242067095,<br><a href="mailto:lestaagbozos@gmail.com">lestaagbozos@gmail.com</a> |
| Micheal Kyere            | K. M. H. D           | 0240692043  |
| Genevieve Amewoseanyenya | K. M. H. D           | 0247279015  |
| Saint Raymond            | K. M. H. D           | 0243574005  |
| Edith Sefakor Amutti     | K. M. H. D           | 0244960906  |

#### **DIARRHOEA CASES**

##### ***List all sources of diarrhoea data***

1. Over the counter drug sellers
2. Health officers
3. Herbalist

Identify type of data, source and period available

| <b>Type of data</b> | <b>Location</b> | <b>Period (years)</b> |
|---------------------|-----------------|-----------------------|
| Diarrhoea cases     | K.M.H.D/ DHIMS  | 2008*                 |

#### **WASH**

##### ***Identify community WASH structures/systems and location***

1. no public access to pipe borne water
2. rubbish is dumped in lagoon
3. open defecation along lagoon
4. Five public toilet facility
5. wells in individual households

6. some homes have toilets

7. public water tank spoilt

**Household**

what type of household settings do they have (heads/ caregivers etc)

semi urban/ urban

***Water Storage Systems***

1. wells

2. individual tanks storing rain water and bought water

***Food storage systems***

1. Majority do not store food

***Identify household WASH systems***

1. Home toilets (water closets, pit latrines)

2. Wells

3. Gallons for water storage

**COMMUNITY NAME: ANYANYUI & ATITETI****STAKEHOLDERS**

*List all stakeholders (institutions/individuals and organisations they belong to. Indicate role/position in parenthesis) e.g. Mr KKK, GHS, District Director*

1. Mr Frederick Nyavorwoyi - Head teacher, Anyanyui E.P School
2. Mad. Christiana Akakpo - Anyanyui community member
3. Mad. Christie - Anyanyui Health Centre
4. Jacob Apetorgbor - Attiteti community member
5. Simon Akorli - Attiteti community member
6. Samuel Tetey - Environmental health and Sanitation office
7. Jessica Abordor - Environmental health and Sanitation office
8. Dickson Kwawu – Attiteti community member
9. Derrick Hans - Ghana Health Service Directorate (Anloga)
10. Esther Amesawu- Ghana Health Service Directorate (Anloga)
11. Philip Borkogah – NADMO (Anloga).

*What do you need from each of them?*

| <b>Institution/individual</b> | <b>What is needed</b>               |
|-------------------------------|-------------------------------------|
| Mr Frederick Nyavorwoyi       | Dumping sites of waste              |
| Mad. Gifty                    | Wash systems or stations            |
| Christiana Akakpo             | Animal farms                        |
| Jacob Apetorgbor              | Open defecation                     |
|                               | Selected household with caregivers. |

*Names and contacts of stakeholders*

| <b>Name</b>             | <b>Institution</b>          | <b>Contact</b>            |
|-------------------------|-----------------------------|---------------------------|
| Mr Frederick Nyavorwoyi | Anyanyui E.P school         | 0242636177                |
| Chris                   | P.A, Anyanyui Health Centre | 0548693004                |
| Jacob Apetorgbor        | Attiteti community          | 0540414969,<br>0245727329 |

|                   |  |                           |
|-------------------|--|---------------------------|
| Simon Akorli      | Attiteti community                         | 0240059066,<br>0246876488 |
| Samuel Tettey     | Environmental health and Sanitation office | 0240446825                |
| Jessica Abordor   | Environmental health and Sanitation office | 0552245653                |
| Christiana Akakpo | Anyanyui community                         | 0248147883                |
| Dickson Kwawu     | Attiteti community                         | 0549497679                |
| Derrick Hans      | GHS  | 0246484262                |
| Esther Amesawu    | GHS  | 0246588884                |
| Philip Borkogah   | NADMO                                      | 0249288126                |

#### **DIARRHOEA CASES**

##### ***List all sources of diarrhoea data***

1. GHS, Derrick Hans.

Identify type of data, source and period available

| <b>Type of data</b> | <b>Location</b> | <b>Period (years)</b> |
|---------------------|-----------------|-----------------------|
| Diarrhoea cases     | GHS/DHIMS       | *                     |

#### **WASH**

##### ***Identify community WASH structures/systems and location***

1. public access to pipe borne water
2. rubbish is dumped in containers
3. open defecation along beach and bushes
4. some homes have toilets

#### **Household**

what type of household settings do they have (heads/ caregivers etc)

semi urban/ urban

##### ***Water Storage Systems***

1. Pipe borne water

##### ***Food storage systems***

##### ***Identify household WASH systems***

1. Pipe borne water

2. Households have toilets.