**BIOGAS ASSESSMENT PROJECT**

**Site ID: 17**

**Date: July 22, 2022**

**Interviewer**: Where did this digester originate from?

**Interviewee**: It came from Green Malata.

**Interviewer**: Okay, Who designed it?

**Interviewee**: It is Green Malata.

**Interviewer**: Okay, who built it?

**Interviewee**: Green Malata did everything, including the funding.

**Interviewer**: When was it built? And, how long did it take to build?

**Interviewee**: It was built in a week. It has been 3 years now.

**Interviewer**: How many people from Green Malata built this?

**Interviewee**: 3 people.

**Interviewer**: How many people from your side assisted in the construction of this digester?

**Interviewee**: It was 4 people.

**Interviewer**: What was your role?

**Interviewee**: Basically, we were only supporting them. They did everything.

**Interviewer**: What did you support them in?

**Interviewee**: We supported them in constructing of the whole digester; Thus, we assisted them in digging of the hole, making of feedstock, and assembling of the digester.

**Interviewer**: Okay, how were you selected as a beneficiary?

**Interviewee**: The Senior Chief is a friend of the white person at Green Malata. So, the white person thought it wise to build a digester here.

**Interviewer**: Okay, nice. How did you participate in the selection process?

**Interviewee**: It was very much the decision of the white man to assist the senior chief with gas for cooking.

**Interviewer**: Did you know about biogas before?

**Interviewee**: No, we didn’t know anything about biogas. We were even surprised what it was. So, after installation of the digester they gave us storage bags to use for harvesting gas.

**Interviewer**: How did it feel to get the digester?

**Interviewee**: We embraced it but the only problem was that the storage bag developed a problem; it started leaking gas as it had a puncture, and it was very hard for us to replace.

**Interviewer**: How did it start leaking gas?

**Interviewee**: It started leaking gas on its own. So, after harvesting gas from the digester bag, gas was escaping from the storage bag.

**Interviewer**: Okay, what were your expectations of biogas?

**Interviewee**: We didn’t expect to get biogas from Green Malata, so it came as a surprise. We didn’t believe that we could get a digester, something we didn’t know at the time. So, we were worried that we would not manage to operate it. But, after they explained to us about it, we started using it without problems; it was simple, we simply harvested gas, and then used the gas for cooking food on the stove. Thus, we had high expectation of cooking on biogas without challenges.

**Interviewer**: Oh nice. What did the installers tell you to expect from the digester?

**Interviewee**: Initially, they told us its feedstock, which was animal manure, or banana leaves mixed with sugar. Then, they told us that after feeding the bag, it would be producing gas and cause the digester bag to fill with gas. So, when we saw that the digester bag full, we were getting the storage bag to harvest gas. After harvesting gas, we used to connect the storage bag to the stove and start using the gas for cooking.

**Interviewer**: How big was your storage bag?

**Interviewee**: It was fairly big. But, it was not big as the digester bag.

**Interviewer**: Like a 50 kg sack bag?

**Interviewee**: No, it was bigger than a 50 kg sack bag. I think it was similar to 2 sack bags (50kg) [100 – 200 liters of gas]

**Interviewer**: So, you were taught how to harvest gas?

**Interviewee**: Yeah, they taught us.

**Interviewer:** How did you harvest gas specifically?

**Interviewee**: We were connecting the storage bag to the digester and a pump. So, gas was moving from the digester to the storage.

**Interviewer**: Was it hard?

**Interviewee**: No, it wasn’t.

**Interviewer**: What type of training did you receive?

**Interviewee**: We didn’t have any training.

**Interviewer**: Ah, is it possible.

**Interviewee**: Yeah, we had no training. They just explained to us certain things, so we were doing what they explained to us.

**Interviewer**: What did they explain?

**Interviewee**: They told us that if we wanted to cook or harvest gas, we should be feeding the digester with manure. Then, we should be connecting the storage bag to the stove to cook. So, gas was moving from the digester bag, and then to the storage bag, and then to the stove for usage.

**Interviewer**: What else?

**Interviewee**: That was all. I believe we would have learned more if we had training.

**Interviewer**: Out of curiosity, what you were told is that not training?

**Interviewee**: (laughs) It’s different because at training you learn more. I feel there was a lot more we could have learn, and I’m sure it would have been working today, if they trained us. If we had training, we would have known where to get storage bags, how to fix them or even how to improvise. And, I’m very certain that if we knew where to buy a storage bag, we would have tried our best, even to a point of getting a loan, to buy the storage bag, if we knew where to find them.

**Interviewer**: What kind of training did you want? What kind of training did you have in mind?

**Interviewee**: (Laughs) We expected then to tell us how to fix issues, for example, how to fix leakages on the storage bags; where do we find the storage bags. If they had given us this kind of information, I would have made porridge for you today to see how it works because it could have been working.

**Interviewer**: So, the so-called training was basically on operation, and not maintenance.

**Interviewee**: Yeah!

**Interviewer**: You know nothing stays forever. Even if you get a bike, it has its own issues with time. Why didn’t you ask them to train you on maintenance?

**Interviewee**: It’s true, we didn’t ask them, but we should have asked them to. But, after it broke, they came twice so we expected them to tell us where to get the bag or something. But, they never said anything.

**Interviewer**: How prepared to run or operate the reactor did you feel you were after all that?

**Interviewee**: We were so confident that we would operate it, and we were really using it. We were able to boil water, and cook on it.

**Interviewer**: You had all the right to deny the digester, why did you accept it to be built here?

**Interviewee**: We accepted it because it saves firewood. With a digester, you don’t need to move around searching for firewood. So, we saw that it was good because it would enable us to cook without firewood, and also give us a chance to stop cutting trees in the forests.

**Interviewer**: Is it different to source feedstock to make fireand to source firewood to make fire. Isn’t that the same?

**Interviewee**: Oh, it’s different. With biogas, you simply ask for manure or buy the manure, and then make feedstock. While with firewood, you go to the forest, and sometimes forest officials catch you. Moreover, trees are planted to save the environment, and when you cut a tree, you damage the environment. You can’t keep cutting trees and expect things to be okay. So, that comes with serious consequences, for example, rainfall shortages. Also, the dwellings and the environment we live in look pleasant because of trees. So, it’s very different.

**Interviewer**: What did the people from Green Malata tell you to expect from this? What was your first encounter with them like?

**Interviewee**: They had a discussion with the Senior Chief that they wanted to bring biogas for cooking, so he accepted it. And, it was easy for him to accept it because he is always moving around, so he must have seen this somewhere.

**Interviewer**: How did you meet your energy needs before the intervention?

**Interviewee**: (laughs) we were cooking on things that get you in trouble with forest officials [firewood]. And, even now, we have reverted to that. It is just like we took a short break! But, we have reverted to firewood, simply because the digester malfunctioned.

**Interviewer**: Where do get the firewood?

**Interviewee**: In the forest where the Luchenza river flows.

**Interviewer**: Ah, do you have forest officials there?

**Interviewee**: yeah, the government through the forest department protects it. They protect the forest to keep the river intact because it supplies drinking water to many.

**Interviewer**: What’s the name of the forest?

**Interviewee**: It’s G something… I have forgotten it’s full name. But, it starts with a G.

**Interviewer**: So, the government protects it.

**Interviewee**: Yeah, and when you are caught they give out heavy punishment and huge fines.

**Interviewer**: How big are the fines? And, have you been caught?

**Interviewee**: (laughs) Oh, no. We just try to avoid that by not going there. So, we just buy from the people who get the firewood from there.

**Interviewer**: Oh, I wouldn’t imagine a chief going there to cut and steal trees…

**Interviewee**: Yeah, and at first people were very skeptical about selling us the firewood. They thought we would report them to the officials.

**Interviewer**: I would think the same too. So, you rely on firewood in terms of cooking.

**Interviewee**: Yeah, that’s our reliable source of energy for cooking.

**Interviewer**: Charcoal?

**Interviewee**: No, it’s not common here.

**Interviewer**: Why not?

**Interviewee**: When you compare the price of charcoal and firewood, there is a difference. Firewood is cheaper; a bundle of firewood is at K3000, while a bag of charcoal starts at K8000 going upwards.

**Interviewer**: How much firewood do you use or buy in a day, week or month?

**Interviewee**: I don’t record that information.

**Interviewer**: Just an estimation…

**Interviewee**: Maybe, I use firewood of K1000 per day.

**Interviewer**: How much were you saving on firewood that time?

**Interviewee**: I was saving money because I wasn’t buying firewood.

**Interviewer**: You were not buying firewood at all?

**Interviewee**: Yeah, I was cooking everything on biogas, excluding beans. I was even warming bathing water on it.

**Interviewer**: Why not beans?

**Interviewee**: It was taking long to cook beans, and gas was finishing even before the beans got cooked [cooking time of less than two hours].

**Interviewer**: But, you were able to cook nsima….

**Interviewee**: I was able to cook nsima, light side dishes, porridge for the kids and all that.

**Interviewer**: Howdo you differentiate cooking on biogas and cooking on firewood?

**Interviewee**: The good thing with biogas is that you don’t need to blow the fire constantly with air to keep it blazing; So, you simply put a pot on the stove and cook your things without doing anything else. It’s different. And, it’s fast.

**Interviewer**: Is the taste the same?

**Interviewee**: The taste was the same.

**Interviewer**: Did you have livestock that time?

**Interviewee**: No, we didn’t have.

**Interviewer**: What were you supposed to feed it again?

**Interviewee**: Cow manure, food waste, banana leaves. So, we used to mix these things together, and then add sugar. I think we had a mix, which was crushing these things together before feeding the digester.

**Interviewer**: Like how much sugar?

**Interviewee**: Just a cup of sugar; the common blue cup for drinking tea [250 g]

**Interviewer**: How did you manage food waste and banana leaves before the intervention?

**Interviewee**: We used to throw them away because we didn’t know how to use them productively.

**Interviewer**: Okay. How much feedstock did you start it with?

**Interviewee**: I don’t know, because I wasn’t involved in that process. Men only did the work as they didn’t come with any female.

**Interviewer**: How long did it take to start up?

**Interviewee**: It didn’t take long; it didn’t take more than a month.

**Interviewer**: How did it work after commissioning?

**Interviewee**: After harvesting gas in a storage bag, we were able to use the gas with no problem.

**Interviewer**: How often did you harvest the gas?

**Interviewee**: Usually, we harvested gas once a day. But, when gas was finished in the storage bag, we used to harvest gas again, if we saw that the digester bag had gas. So, we were harvesting gas twice a day sometimes, but it was usually once in a day. But, the gas that we produced, depended on the amount of feedstock that was fed.

**Interviewer**: How much cooking time did you get from it? How did yourday look like in regards to cooking?

**Interviewee**: If we filled the storage bag, we were able to cook the whole day. If the storage bag wasn’t full, we used to cook in the morning and at lunch.

**Interviewer**: What times were you not able to fill your storage bag? Or, why was your storage bag not full sometimes?

**Interviewee**: During the dry season, we used to harvest more gas because gas production process was happening fast around that time. In cold season, it was taking time tofill the bag because the process was slow.

**Interviewer**: I understand digester produce effluent that is used as fertilizer. What did you do with your effluent?

**Interviewee**: We didn’t know what to do with it, so we used to dispose of in the field.

**Interviewer**: You were told about it?

**Interviewee**: No.

**Interviewer**: Seriously?

**Interviewee**: Yeah. If they did, they told only my husband. But, if he was told, he would have told me without a doubt because that’s a very crucial thing. So, as far as I know, we weren’t told about the digestate.

**Interviewer**: What were the operationrequirements?

**Interviewee**: To start it up we used those two containers (100 liters), and 4 other containers that were for collecting water or for mixing the feedstock. In total, we had 6 containers, so 3 were for cow manure and 3 water. So, we mixed it until we got suitable slurry.

**Interviewer**: How big were the other 4 containers?

**Interviewee**: I think they contained 4 or 5 buckets of 20 liters. So, they were pretty much the same but different shapes.

**Interviewer:** Okay, how did you prepare the feedstock?

**Interviewee**: We were mixing the feedstock together in a bucket until suitable slurry was reached. So, I think we were feeding it with 3 buckets of feedstock and 3 buckets of water every day, I think. I don’t really remember because the garden boy was the one doing that. You are just unfortunate today that he is not around, but he is usually around.

**Interviewer**: I will get his number at the end, so that I can communicate with him.

**Interviewee**: He doesn’t have phone [he had a very old phone that wasn’t working work (boy voice in the background)]. So, the garden boy knows a lot about feeding, and he can give you better answers on that question.

**Interviewer**: Then, I will get your phone, so that when he comes you could notify me.

**Interviewee**: (Laughs) I don’t have a phone too. I will write your phone number, so that I Can call you once I have a phone.

**Interviewer**: That sounds like a plan. Or, I will use your husband’s phone. But, I understand he is always moving. So, who was really responsible for feeding it? Is it the garden boy only?

**Interviewee**: Yeah, the garden boy who was feeding it.

**Interviewer**: How did he describe that task?

**Interviewee**: It was a lot of work and he used to complain about it. But, he was motivated because the installers gave him a work suit…. But, on the first day, he complained a lot that he wasn’t given money, because he felt the work was huge and hard on the first day. Also, he wanted a monthly salary for feeding the digester. But, we took it as a community thing, so there was no need to pay him money.

**Interviewer**: Did it meet your needs?

**Interviewee**: It met our needs, but we can’t say 100% because we were not able to cook beans.

**Interviewer**: Apart from beans, what else were you not able to cook?

**Interviewee**: That was that!

**Interviewer**: Side dish of beef?

**Interviewee**: Yeah, we were able to cook that!

**Interviewer**: What were the challenges?

**Interviewee**: We had challenges in sourcing cow manure because some people would not share us because people use it for fertilizer. So, that was the only challenge.

**Interviewer**: Was the fact that it didn’t produce enough gas in cold season a problem?

**Interviewee**: Yeah, that’s was a challenge.

**Interviewer**: How much cooking time did you get in wet season?

**Interviewee**: It was not much as in summer. So, we tried to use the gas economically. For example, we used to warm water on firewood instead of biogas.

**Interviewer**: How did it stop working?

**Interviewee**: It stopped when a storage bag started leaking gas.

**Interviewer**: How was it leaking gas?

**Interviewee**: It had a gas pipe, so gas started leaking where the pipe and the bag itself joined. I believe it wasn’t manufactured properly. So, when we harvested the gas, it wasn’t taking time to finish.

**Interviewer**: How did the problem manifest?

**Interviewee**: It was taking long when we were cooking, so we knew that the gas was escaping somewhere. And, it even reached a stage where all the gas was escaping from the storage bag right at the point of collection.

**Interviewer**: What did you do to fix it? Did you call Green Malata?

**Interviewee**: We reported to Green Malata and they brought a new storage bag. But, it also developed the same problem. And, it only took some months. I think it started leaking gas again after 6 months or a bit less. Then, we thought that we should not bother them again. So, we abandoned the digester.

**Interviewer**: You shouldn’t have given up….

**Interviewee**: No, we couldn’t have been going there all the times. Morally, it’s not right. So, we wanted to give them a break.

**Interviewer**: Okay. How long did it take to come to fix the issue after you reported?

**Interviewee**: They were so fast; they came the day we reported. So, when they came they tried to seal the area that was leaking gas with seal tape. It worked for a month. So, we called them again, and when they saw that it didn’t work, that’s when they brought a new storage bag.

**Interviewer**: How long did use it before it stopped?

**Interviewee**: We used it for a year.

**Interviewer**: [question inaudible]

**Interviewee**: So the first storage bag only worked for 6 or 7 months, and then they replaced it with another bag with only worked for 6 months or less.

**Interviewer**: Oh, I see. Have you seen this [table of Intervention]? What do you think about this kind of information, and do you think it would have helped you?

**Interviewee**: It would have helped because we would have been following the information. So, when there was a problem, we could have know the cause and fix it according to the information given.

**Interviewer**: Let me get you on this, my understanding is that you knew the problem, so why didn’t you try to fix it yourself?

**Interviewee**: We tried to fix it using seal tape, but it didn’t work.

**Interviewer**: How would you describe the current state of your digester?

**Interviewee**: It’s not working, and we are not happy about it because we would have liked to use it to this day.

**Interviewer**: Why are you not happy?

**Interviewee**: Because it was helping us a lot. Many people used to come to see it and they wanted it too in their houses. So, we were explaining to them what biogas is and all that. So, it’s sad to tell them that it’s dead.

**Interviewer**: Do you think it will work again?

**Interviewee**: It would work again, if an organization can rehabilitate it and bring new storage bags. But, it would need a lot of effort and money because the sun damaged the digester bag, so it would need replacing too.

**Interviewer**: How long did it take the digester bag to get damaged?

**Interviewee**: It got damaged some time after we abandoned it because maybe we wasn’t using it. So, it could be a year or two after we stopped using it.

**Interviewer**: Okay, How did it reach this stage?

**Interviewee**: It’s in this stage because a storage bag got damaged.

**Interviewer**: Is there anything else?

**Interviewee**: It’s just that! But, if the had told us where we could find the bags I’m sure we could have done whatever it takes to buy the storage bag. If the bag was too expensive, we would have asked to pay on layby to get it.

**Interviewer**: Why do you keep on saying that you could have gotten it on loan? Do you think you couldn’t have managed it?

**Interviewee**: Mmh, we couldn’t have afforded it.

**Interviewer**: Do you know much it would cost?

**Interviewee**: I just think it`s expensive.

**Interviewer**: Like how much?

**Interviewee**: Maybe K200000 or K300000.

**Interviewer**: With this big house, is that much?

**Interviewee**: It’s not our house. It’s the government’s house. We look respectable when we are there; but when we are moving and you see the furniture, you see that we have nothing.

**Interviewer**: (laughs) Now that it’s not working, how do meet your energy needs?

**Interviewee**: We still use firewood.

**Interviewer**: How do you manage your feedstock now that it’s now working?

**Interviewee**: We just throw away the food waste.

**Interviewer**: Where did you get the banana leaves?

**Interviewee**: We have bananatrees behind the house.

**Interviewer**: How did you manage banana leaves?

**Interviewee**: We just throw them away.

**Interviewer**: Where?

**Interviewee**: In the refuse pit.

**Interviewer**: We are going towards the end of the interview. How much did the reactor cost?

**Interviewee**: We just received it as a gift. So, we don’t know how much was spent on the digester.

**Interviewer**: Did you contribute anything in kind?

**Interviewee**: We only contributed our energy in support the installation or construction of the digester.

**Interviewer**: The cement?

**Interviewee**: They brought the cement, stove, and everything.

**Interviewer**: How many people were involved in digging?

**Interviewee**: It was 3 people.

**Interviewer**: Masonry work?

**Interviewee**: 5 people were involved in masonry work.

**Interviewer**: Where did you get water?

**Interviewee**: We have a borehole within [less than 100 meters.]

**Interviewer**: What kind of special items had to be imported from another country?

**Interviewee**: Mmh, I can’t know.

**Interviewer**: Are you certain that it was saving you money the time it was working?

**Interviewee**: I’m very sure. As I said, we spend at least K1000 on firewood every day.

**Interviewer**: What was the biggest change in your life the time you had biogas?

**Interviewee**: The biggest change was that when I was cooking on biogas I was able to do other things. While with firewood, you need to be there to maintain the fire.

**Interviewer**: You seem you don’t like blowing fire… what was the other change?

**Interviewee**: You don’t need to blow the fire to keep it ablaze. If you are there for cooking, you only do the cooking and not focus on the fire. The other thing is that I’m asthmatic. Since it does not produce smoke, it wasn’t exacerbating my situation. Previously, and even now, I struggle a lot with asthma because of the smoke.

**Interviewer**: We are going towards the end of the interview. We have two questions remaining. What is your opinion of biogas?

**Interviewee**: To me biogas is helpful, very helpful. The time I had it I saw its benefits. For example, I was able to cook with ease.

**Interviewer**: Tell me more how it’s helpful…

**Interviewee**: It’s easy to use; the other thing is that you don’t need to search for firewood to cook.

**Interviewer**: What’s the future of biogas in Malawi?

**Interviewee**: Biogas has a bright future. But, many people don’t know about it. So, we need to publicize it, so that people can know it. I believe once people start to know how helpful to the environment it is, many people would adopt it. And, now you have enlightened me that you could get fertilizer out of it too. So, I would like it even more. Also, there is interest in biogas, because we saw a lot of people coming to see it. But, the only challenge is how to assess it. If the government or well-wishers can bring it to the people, I believe, many people would be willing to adopt it.

**Interviewer**: You are saying it has a future…. I’ll put it to you. You were given a biogas digester, but now you don’t have it. So, where is the future there?

**Interviewee**: On that, you can say it has no future because I failed to access the equipment. But, if the equipment were there, then we would have continued.

**Interviewer**: What kind of equipment are you talking about? I mean, we have buckets, pipe here in Malawi.

**Interviewee**: I’m thinking of the digester bags, because I don’t feel like we have them here in Malawi.

**Interviewer**: So, for biogas to progress in Malawi it needs some of the equipment like the digester bags readily available. But, you don’t think the bags are made in Malawi as well. So, that needs to change if we want biogas to progress as a nation. Last question. If you could have designed your own waste or anything intervention, what would you have chosen instead?

**Interviewee**: I don’t have any idea. But, I’ll say biogas is a good innovation.

**Interviewer**: What about a solar system?

**Interviewee**: We have a solar system here, but we don't know how we can make it produce energy for cooking.

**Interviewer**: Okay cool.Thanks for the interview.

**Interviewee**: Welcome