**BIOGAS ASSESSMENT PROJECT**

**Site ID: 25**

**Date: July 27, 2022**

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

**Interviewee**: I have forgotten.

**Interviewer**: During you encounter with them, Where did they say the digester originate from?

**Interviewee**: I think they said India, if not China. It was China, I guess.

**Interviewer**: Who funded it?

**Interviewee**: I think it was from China. Or, maybe some non-governmental organization.

**Interviewer**: Who built it and when was it built?

**Interviewee**: I have forgotten the date!

**Interviewer**: Or just the year.

**Interviewee**: I still need to be reminded.

**Interviewer**: Who was the president back then? Was it Bingu? Was it Peter? Or, Joyce? [list of former presidents]

**Interviewee**: I think it was 2017.

**Interviewer**: I think you are right. I think it was 2016 or 2017.

**Interviewer**: How long does it take to build?

**Interviewee**: Digging and lining the hole took a day. I did that together with my family.

**Interviewer**: How many were you that time?

**Interviewee**: I had five children. I total we were seven including my husband. My children were helping my husband by collecting water while he was building the wall around it. So, that was how it was.

**Interviewer**: Is your husband a builder by profession?

**Interviewee**: Yes, he is.

**Interviewer**: Apart from that, was there anything else you did?

**Interviewee**: Before they came to install it that was what we did.

**Interviewer**: On the day of installation, what did you do?

**Interviewee**: On the day of installation, we collected cow manure and prepared the feedstock – and it was hard work.

**Interviewer**: How many bags of cow manure and water did you work with that day?

**Interviewee**: I have forgotten how much cow manure we used. Oh, it`s been a long. But, it was a lot of cow manure. I think it was 6 bags of cow manure and 6 drums of water.

**Interviewer**: How were you as selected as a beneficiary?

**Interviewee**: We got it because my husband was mostly working with the agriculture department on various programs. For example, he was heavily involved in irrigation, so he was always in touch with the agriculture department. So, when the digester came through the agriculture department he was requested to be a beneficiary.

**Interviewer**: So beyond that why were you chosen as beneficiaries?

**Interviewee**: Our hard work! So, they knew we would embrace the project, and do the work as required.

**Interviewer**: Some say were chosen because we had cows. Did you have cows?

**Interviewee**: No, we did not have cows.

**Interviewer**: So, where were you getting cow manure?

**Interviewee**: We were asking from the people who had cows.

**Interviewer**: How was it like going to people’s houses to ask for cow manure for the digester?

**Interviewee**: It was not hard because many people have a lot of cows here. And, people who have cows like it because it more like you are doing a service of removing cow manure from their cow house.

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

**Interviewee**: We learnt about biogas when the installers came and explained about biogas. So, we were like, “oh okay, is it possible?” and they were like “yes”. So, we were like bring it on.

**Interviewer**: What did they say about biogas that time?

**Interviewee**: When they came, they told us that we would be able to cook using cow manure without any issues…..They said that cow manure would be our new firewood. They also mentioned that we would start using cow manure for cooking and eventually we would stop going to the forest to look for firewood.

**Interviewer**: So, how was the selection process like?

**Interviewee**: I think there was something the project implementers especially the agriculture office looked in people. Therefore, I feel like they weighed the people to see who was capable to manage it. I do not think were just giving the digesters to any person. Moreover, the digesters came as part of a pilot project to see if they could work, so I do not think they could just give to any person.

**Interviewer**: Thanks for the puffs. Let us eat Ma’am. What were your expectations?

**Interviewee**: Thanks for the puffs. We expected to stop going around searching for firewood for cooking. So, we were so happy about it, and embraced the digesters wholeheartedly.

**Interviewer**: So, basically, you expected to cook without firewood?

**Interviewee**: Yeah

**Interviewer**: Aside from that, what else did you expect?

**Interviewee**: We were just happy with the idea of cooking without going to the forest to look for firewood.

**Interviewer**: Did you think about the prospect of using it as a source of fertilizer?

**Interviewee**: Yes, we did. We were getting the slurry, which was coming out of the digester to the farm. So, it was helping us in terms of agriculture. I had a garden close to the digester, which I was using the digestate as fertilizer. Some people were not using the digestate, but some we were not.

**Interviewer**: Why were some not using the digestate?

**Interviewee**: Some did not dig a hole, but a drain so it was simply flowing – maybe they did not find it useful as they had other means of finding fertilizer.

**Interviewer**: How did you collect the digestate?

**Interviewee**: The maize was healthy, the yield was dumper, and we were not buying fertilizer. We were fully dependent on the digestate.

**Interviewer**: Which fertilizer were you using before this?

**Interviewee**: We were buying inorganic fertilizer from Agora Shops.

**Interviewer**: How many bags were sufficient for your needs?

**Interviewee**: I was simply buying in small quantities because I did not have the money to buy a bag or in bulks. So, I was buying 10 kgs of fertilizer at one point. Then, I would find that was not sufficient, so I was buying another 10kgs. So, it was always like that.

**Interviewer**: How much fertilizer were you using at the end of all that?

**Interviewee**: In one growing season, we used probably 100 kg of fertilizer and that`s 2 bags of 50 kg fertilizer; one for quick growth of maize, and the other for strong maize kernels.

**Interviewer**: How much was a bag of fertilizer then?

**Interviewee**: It was K20000.

**Interviewer**: Now?

**Interviewee**: It’s K60000 or K70000

**Interviewer**: How did you prepare the digestate collection point at the outlet?

**Interviewee**: We dug a hole and digestate was flowing into the hole. So, we were collecting digestate from the hole.

**Interviewer**: Was the digestate not sipping into the ground? I mean, did not you lose some of the digestate by that collection system?

**Interviewee**: We were getting the digestate straight to the farm, as it was plenty. Of course, some was lost in the way. Some was lost in the ground. So, we had challenge of collecting and containing it.

**Interviewer**: Why did you buy a big bucket and place it there? Or, why didn’t you line the hole for the collection of digestate?

**Interviewee**: (laughs heavily) yeah, but I did not use it for long, because it did not last long. I only used it for one growing season. It did not last a year. So, I do not know if my colleagues used it for long, but as for me, I did not use it for more than a year. The pipes got broken, so it did not produce gas any more… And, the digester was made to produce digestate when it was producing gas. But, if there was no gas production, no digestate was produced…. So, I used it for a very short time. I think, I used it for 6 months.

**Interviewer**: What often did it release digestate and under what circumstances?

**Interviewee**: I do not know how often but after sometime digester just was producing digestate with a loud sound, if the sun was hot. When it was cloudy, the digester would not produce gas – it did not work. Also, it was only working after 9 AM to 2 PM. It was working without the sun, so after 2 PM it was not working.

**Interviewer**: Okay, what kind of training did you receive?

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

**Interviewer**: Then, how were you able to switch it on and off?

**Interviewee**: The installer simply told what to do. But, we did not receive training.

**Interviewer**: What were you told by the installers? What did they say?

**Interviewee**: They told us how to turn it on and off.

**Interviewer**: So, then say they told you how to switch it on. Okay, what else?

Interviewee: What else? That was that, because that meant that we would now cook. So, yeah, they showed us the button for switching the burners on and off.

**Interviewer**: Did they tell you anything about maintenance?

**Interviewee**: No, they didn’t and that's why it didn't last long. And, that’s why when it malfunctioned we did not know what to do to fix it.

**Interviewer**: How prepared did you feel prepared were to run it?

**Interviewee**: Yeah, we were very much prepared. And, that`s why we were able to use it whenever there was sunlight

**Interviewer**: You had the right to deny the digester. Why did you choose to accept it?

**Interviewee**: Yes, indeed, it was possible to say no. And, when you think of the work that is involved, one would easily say no. I mean, we used to feed it with five buckets of cow manure, if I’m not mistaken. To that, we added water, so it was really a tiresome job.

**Interviewer**: Then, why did you accept it?

**Interviewee**: … and the manure was flesh, not dry (laughs heavily) - fresh manure! But, we accepted it and persevered, And, I was also handling the manure with bare hands. So, it was tough, and I only accepted it because we wanted to cook without going around looking for firewood.

**Interviewer**: Is firewood hard to find here?

**Interviewee**: Yeah, very much. It is very hard to find firewood in this part.

**Interviewer**: Where do you get wood?

**Interviewee**: It is very far from here - from the mountains.

**Interviewer**: So, how did you meet your energy needs before the intervention? So, where you only using wood or you were also buying charcoal?

**Interviewee**: I was only using firewood.

**Interviewer**: Like how much firewood?

**Interviewee**: We collect wood in bundles. So, we used the bundles in three days.

**Interviewer**: In a week, how many days were you going to the mountain to search for firewood?

**Interviewee**: Two times in a week.

**Interviewer**: Like if you go on Monday, you were using the wood from Monday through Wednesday. And, maybe go again on Thursday, and use the wood from Thursday to Sunday. That is some job.

**Interviewee**: That some hard work indeed.

**Interviewer**: How did you differentiate cooking on biogas with cooking on firewood?

**Interviewee**: Biogas is fast. With firewood, you need to find grasses first to help start the fire. So, it`s difficult to start up. So, biogas is fast because you simply need a matchstick to light up light up the burners… So, biogas is faster than firewood.

**Interviewer**: So it was faster because it did not involve so many processes or even because the flame itself was stronger?

**Interviewee**: The process is faster. The flame itself is stronger than that of firewood. But, if you put enough food, firewood produces stronger flames than biogas. Also, the flame of biogas was dependent on the sun. If the sun was minimal, the gas was less and the flame itself was not strong. But, at noon especially in October [summer], the flame was just strong.

**Interviewer**: In June [wet season]?

**Interviewee**: Ah, we could not even cook in June.

**Interviewer**: Oh, really?

**Interviewee**: Yeah, if the sun was like this [humid and a little bit sunny], we would not cook. It could not even start.

**Interviewer**: But, it is not cold.

**Interviewee**: Yeah, we would not cook even when it was like this. It needed to be hot to get the flame

**Interviewer**: Oh, it is tough

**Interviewee**: Yeah, and that is when the idea of putting a bag of sand or stones on top of the digester came. So, we used to put a load on top of the digester bag to help push the gas to the stove.

**Interviewer**: How did you learn that?

**Interviewee**: We just thought that on our own.

**Interviewer**: You said you were getting manure from other people. Before the digester, were you also doing the same?

**Interviewee**: No, for what?

**Interviewer**: Maybe for fertilizer?

**Interviewee**: Oh, yes, we did. We were using cow manure as fertilizer for our crops and vegetable garden.

**Interviewer**: But you told me you were using organic fertilizer?

**Interviewee**: We were mixing [cow manure and inorganic fertilizer]. Sometimes, we were only using manure extension workers told us to use. They told us that we could make strong fertilizer from cow manure by adding maize grain, yeast and 5 kgs of inorganic fertilizer.

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

**Interviewee:** I believe it was 6 bags of 50 kg of cow manure.

**Interviewer**: Water?

**Interviewee**: I think it was 6 drums of water.

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

**Interviewee**: We got it from the lake. It is there.

**Interviewer**: Oh, less than 150 meters. How long did it take to start up?

**Interviewee**: Our digester bag got fully inflated on the 3rd day, and on the 4th day we started using it. The installers came in their cars and moved from one beneficiary to another to commission the digesters.

**Interviewer**: How much gas did it produce? How much cooking time did you? Were you able to prepare breakfast, lunch and supper after commissioning?

**Interviewee**: We could not cook breakfast in the morning. We used to cook after 9:00 o’clock when the sun was out. So we were basically cooking from noon to 2:00 PM. Thus, we could not cook in the morning and in the evening.

**Interviewer**: So you were getting cooking time sufficient for cooking lunch only?

**Interviewee**: Yeah, we were only getting gas enough for cooking nsima and side dish as well as for boiling bathing water [approximately one hour].

**Interviewer**: And only if there was sunlight?

**Interviewee**: Yeah, when the weather was like this, it would not even start.

**Interviewer**: How did you use the gas? Did you use it for cooking only?

**Interviewee**: Yeah, it was only for cooking.

**Interviewer**: What were the operation requirements?

**Interviewee**: First, you need to dig a hole and line it to prevent soil from collapsing into the bag. Then, you need cow manure and water – That was it.

**Interviewer**: What were you doing with the cow manure and water?

**Interviewee**: We were mixing cow menu with water using hands. Then, we used to pour the feedstock into the digester bag in one of the two white pipes. And, the pipe where the feedstock was not poured into, is where the digestate was coming out from

**Interviewer**: How did you feel about all that?

**Interviewee**: We accepted with the digester, so could not have done otherwise. We did not feel disgusted because we accepted the whole process when we accepted the digester. Also, the installers were the first to mix the feedstock using bare hands, when they were teaching us how to make feedstock. So, that is also we were doing ourselves..

**Interviewer**: (laughs) If the visitors were doing that…..

**Interviewee**: (laughs)…. What could we have done?

**Interviewer**: (Laughs) how often did you feed it? And, in what quantities?

**Interviewee**: We were feeding it with four buckets (20 liters) of cow manure every day.

**Interviewer**: Who was responsible for feeding it?

**Interviewee**: My family was responsible; I was my children, husband, and I.

**Interviewer**: What were the maintenance requirements?

**Interviewee**: They told us to take good care of it; they said we should ensure that children are not playing around it. And, they said we should be alert and aware of the surrounding.

**Interviewer**: How were you supposed to take care good of it? Could you please elaborate on that?

**Interviewee**: Like to look after the pipes. If a pipe was bent or wound, we used to straighten them up. Also, check for loose connections in the connections, and generally monitor the pipe that over the ground.

**Interviewer**: So children were not supposed to come near it?

**Interviewee**: Yeah

**Interviewer**: Why?

**Interviewee**: I order to prevent them from cutting the pipes with razor blades or something, and even from disconnecting the pipes.

**Interviewer**: Who was responsible for maintenance?

**Interviewee**: It was the installers. But they did not say we should be calling them if there was a problem with the digester.

**Interviewer**: Did they give you their numbers?

**Interviewee**: Yes, they did. But they did not tell us that we could call them when there was a problem - They did not say anything like that, and that is why we abandoned it after it malfunctioned.

**Interviewer**: Is it wrong to say, it didn’t meet your needs because you could not cook on it all the times?

**Interviewee**: You are not wrong at all, because I was only able to cook on it at lunchtime, and I was still cooking using firewood to meet my cooking needs.

**Interviewer**: You said you were getting firewood from the mountains, are you still sourcing firewood from the mountain.

**Interviewee**: Yeah, I still go there twice a week to get firewood.

**Interviewer**: How many times were you going there to get firewood when the digester was working?

**Interviewee**: That time the digester was helping us. We could not go twice there as now. We were probably going there once a week, because the digester was supplementing the cooking time we were getting from firewood. Thus, we were only using firewood in the morning and at evening.

**Interviewer**: What were the challenges?

**Interviewee**: It is mostly what I have already talked about; it was not giving us enough gas to cook for a long time. Moreover, it was not producing strong fire at times. It was taking a lot of effort to make feedstock, but it was only producing small cooking time – that was a problem – it did not meet our needs.

**Interviewer**: How was the fire going off?

**Interviewee**: It was gradually going off, and eventually it was going off completely.

**Interviewer**: Was there are leakage?

**Interviewee**: No, there was no leakage. But at the end, it developed a leak at the joint between the digester bag and pipe [gas connector]. So, we tried to bond the gas connector with glue, but it did not help, and that was the end of it. Because after that, when the bag was full, some of the gas was escaping and little gas was coming to the stove. Thus, we could not even cook at all.

**Interviewer**: How did you know that it was the gas connector? How did it manifest?

**Interviewee**: We did troubleshoot, when we saw that the bag was full and gas was not coming to the stove. So, we found out that gas was escaping at the joint.

**Interviewer**: How did you troubleshoot?

**Interviewee**: When saw that the bag was full, but gas was not coming to the stove, we were very surprised. Then, we tried to find the problem. So, we moved our ears on and around gas connector and the pipes. Then, we heard a gas leaking sound at the gas connector.

**Interviewer**: (laughs) that was funny. How long did it work before it stopped working?

**Interviewee**: We used it for six months. After that leak at the gas connector, it did not work again because of a separation at that gas connector

**Interviewer**: Did you call installers?

**Interviewee**: I think we called them and reported that gas was leaking at the gas connector. They just said okay and that they would see what they could do - that was it.

**Interviewer**: Did they come?

**Interviewee**: They never came. They never came to see the problem.

**Interviewer**: Have you ever seen something like this [table of intervention]? What do you think of information and do you think it would have helped?

**Interviewee**: If they had given us this and told us where to find the materials, it would have helped. Therefore, with this we would have known what to do, if they had told us where to get the spare parts to fix the problem. It`s sad they just give us the digester without necessary information, so when it malfunctioned that was the end of it.

**Interviewer**: So if they had given this to you we would have been talking a different story or even eating nsima cooked on the digester?

**Interviewee**: (laughs) Yeah, You would have eaten nsima with bonya [very small fish popular in the markets] today

**Interviewer**: If the installers call to ask about the digester, what would you say? I mean, how would you describe the current state of your digester?

**Interviewee**: It got broken long ago. I would say I don’t have a digester.

**Interviewer**: Do you still have the equipment?

**Interviewee**: I still have a broken stove. I have the pipes, which I am using as a clothesline.

**Interviewer**: In your opinion, what caused it to fail?

**Interviewee**: It`s because gas connector had a problem, as it couldn’t get a tight grip of digester bag. As a result, gas started to leak. And, once digester starts leaking gas at the gas connector, you should expect anything good to come out of it, because gas is what makes a digester produce gas at the burners, and it`s hard to fix. So, after that, we could have done nothing, and it died.

**Interviewer**: In your opinion, what was the major issue? Was it the fact that we did not come when there was a problem or the problem itself was big that it could not have managed to fix?

**Interviewee**: The main issue is that the installers did not help us. They should have given us spare part. Even a car has spare parts so that when it has a break down the parts that have malfunctioned should be replaced. Thus, if you given something without spare parts do not expect it to last, because once there is a problem you cannot remedy it, and eventually it dies.

**Interviewer**: How to meet your energy needs now that is not working? You said you use firewood?

**Interviewee**: Yeah.

**Interviewer**: What challenges do you meet there?

**Interviewee**: Thorns prickle us because trees we use for firewood here are thorny, so our hands get bloody sometimes. Snakes even bite us too.

**Interviewer**: Oh, sorry

**Interviewee**: Wasps even bite us.

**Interviewer**: That`s very tough. We are going towards the end of our interview. We have like 10% left. How much did the digester cost?

**Interviewee**: They did mention the cost, but I have forgotten what they said. It was a lot though.

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

**Interviewee**: We provided bricks, cow manure, and water.

**Interviewer**: How many bricks?

**Interviewee**: I have forgotten, but I think it was close to 500.

**Interviewer**: How much did it cost you?

**Interviewee:** Mmh, I cannot remember. However, I think in total, if all the labor and materials are accounted for, I think I spent more than K100000 in 6 months. That is considering the work of collecting water and manure. I think, if I had hired someone to do that, he could have charged me K25000 per month because that was a lot of work.

**Interviewer**: How did the digging?

**Interviewee**: It was my husband together with my two boys. The rest of us were simply collecting water.

**Interviewer**: He did the masonry as well?

**Interviewee**: Yeah

**Interviewer**: Is there anything else that had to be imported from another country? When you look at digester, do you think it is from Malawi?

**Interviewee**: I think, it is not for Malawi.

**Interviewer**: Why do you say that?

**Interviewee**: The installers said it was from outside the country. And, even its appearance itself can tell that it is not from Malawi.

**Interviewer**: How did it look?

**Interviewee**: Its design and appearance looked like nothing I had seen before. It was my first time to see it.

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

**Interviewee**: There was a difference because I was free and happy. In addition, most people were coming to admire it as well, and they liked it when they saw you just switch it on with a button to get fire.

**Interviewer**: Oh, many people showed interest?

**Interviewee**: They admired it a lot and wondered how they could own one someday. Then, I was telling them that one day their dream would become reality as this was only a demo. Therefore, if they continue showing interest then the installers were going to be motivated to bring more.

**Interviewer**: What is your opinion of biogas?

**Interviewee**: I desire to have biogas again. But, next time they need to make adjustments to the digester itself?

**Interviewer**: Why and how?

**Interviewee**: The good thing is that it was taking the burden away from us; with 4 buckets of cow manure and water, I was able to cook. However, they need to address the issue concerning sunlight, because like I said without sunlight I wouldn’t cook. It’s very imperative that they solve this issue. Imagine, it was impossible for us to cook porridge for school going kids. It was even difficult to warm bathing water for the kids before they left for school, if there was not sunlight or early in the morning.

**Interviewer**: What technological modifications would you think of?

**Interviewee**: Maybe, if they can shift it to electric power before it is hard for people like us to go asking for manure all the times. If the can make it like solar, then we would appreciate it even more.

**Interviewer**: What are the pros and cons of biogas?

**Interviewee**: With biogas, you cook with ease. Moreover, it is easy to start the fire with matchstick. Its cons are; it is tiresome, as it needs daily feeding; you cannot do the work when you sick because it is intense. You need to be healthy to prepare the feedstock. Unlike solar, you just take the panel to the sun, and then you are safe.

**Interviewer**: Okay, I get it. What is the future of biogas in Malawi?

**Interviewee**: It is bright and it can really help us to conserve the environment because it stops people from going to the forest to get wood.

**Interviewer:** Do you think you are in a position to say that the future is bright when you were given one and now it is dead?

**Interviewee**: Good. With the research you are doing, you need to come up with ways of making it better, so that it can become durable and efficient, and help people better next time; do not stop the project here, keep it going.

**Interviewer**: Do you think if we can give 10 digesters to 10 people, or if we can give you another digester, do you think in five or ten years it can still be working?

**Interviewee**: Yes, it may be possible. On our part, we can be more than willing to get one again. And we can take good care of it. And you can even see that we still have materials for the last digester. But, you may need to tell us where to find the spare parts for it, so that we can fix it on our own once it malfunctions. Or, you can simply give us contacts of people who fix it too, so that we can call them once it malfunctions. We failed on this because there was no one to fix it for us. They simply abandoned the digester to us.

**Interviewer**: You give an example of a car. You said to maintain a car you need the spare parts. Spare parts are not free; can you be willing to pay for spare parts instead of going to the mountains to get firewood free?

**Interviewee**: Here people are very business oriented. So, what we can be doing is sell thobwa (traditional sweet beer) and save some of the money. It is the same like electricity, to keep it running you need a business to pay the bills.

**Interviewer**: Can you pay K15000 to fix your digester?

**Interviewee**: No, I cannot. But, it can depend on other situations as well. If I can see that it is helping my family and it is contributing to my business, then I can. If I can see that I have stopped going to the forest to get firewood completely, then I can sacrifice money to fix it. To own something valuable you need to make sacrifices. It is like having a baby. When you have a baby, you are obliged to save money in case of an emergency.

**Interviewer**: (Laughs) so should we say you have money safer?

**Interviewee**: (Laughs) yeah, I do have. I have kids, so it is only necessary. I keep money in a safer. You cannot be going around asking for money from neighbors while your child is dying and in need of urgent medical support.

**Interviewer**: (laughs) true. Last one, though I feel like you have kind of answered it already. My next and last question is, if you could have designed your own waste or energy intervention, what would you have chosen instead of biogas?

**Interviewee**: I would have chosen solar instead of biogas.

**Interviewer**: Why?

**Interviewee**: With solar you do not need to go to a neighbor to ask for cow manure. You only needed to take out the solar panels to the roof, and with it, you can also use it for lighting.

**Interviewer**: Thanks. That was my last question. Do you have anything to say?

**Interviewee**: Biogas is very helpful. It makes you feel proud and it gives you peace. And when we had it we stopped going to the forest. Maybe, we were going just once instead of twice. It is very handy.

**Interviewer**: When you say, you felt proud, what do mean?

**Interviewee**: It makes you feel like you have electricity in your house. A person who has a house connected to electricity is a happy person, because when he wants to cook, he only hit the switch. You do not get dirty; you do not get cough or flu because of the smoke. Biogas does not produce smoke; when you are cooking, you are peace; it does not blacked pots – so it is a joy to have it!

**Interviewer**: That’s the end of our interview. I thank you for your time.

**Interviewee**: Welcome!