**BIOGAS ASSESSMENT PROJECT**

**Site ID: 23**

**Date: July 26, 2022**

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

**Interviewee**: Mmh, I do not know where it came from.

**Interviewer**: No, you do not know.

**Interviewee**: Yeah, it has been long

**Interviewer**: Let me see between you and your daughter, so that you can help each other in answering questions. Let me put it this way, who brought it here? Was the agriculture extension worker, who has come involved?

**Interviewee**: Yeah, it came with the individual you are with, [name redacted].

**Interviewer**: Did he come alone? How many people did he come with?

**Interviewee**: There were five people; two females, one of which was pregnant; [name redacted] and two other male people.

**Interviewer**: You said it has been long. How long has it been? When was it built?

**Interviewee**: It was in 2016. I remember that time I was pregnant with those twins.

**Interviewer**: So, they were born in 2017?

**Interviewee**: It was the same year. They were born on 28 August 2016.

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

**Interviewee**: It took one month from the time we started digging to the point we started using it.

**Interviewer**: Oh, I see. How were you selected as a beneficiary?

**Interviewee**: The extension worker simply told me that I was going to be given a digester. After some days, I saw him coming with people and the digester bag.

**Interviewer**: So you were just told that you were getting a digester. Okay, did you ask him why they brought it to you out of all the people in this village?

**Interviewee**: No, I did not ask.

**Interviewer**: Why? What if it were bringing a bomb?

**Interviewee**: (laughs) we know the extension worker and he always comes with good news. So, we saw their coming as a blessing, and that is why we did bother to ask questions.

**Interviewer**: (Laughs) what was your role?

**Interviewee**: Our role was to find cow and water.

**Interviewer**: [question inaudible]

**Interviewee**: We got water from the borehole.

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

**Interviewee**: It was three people.

**Interviewer**: It was three people… It sounds like you did not take part?

**Interviewee**: Yeah, that time I was pregnant with my twins.

**Interviewer**: Oh, yeah, yeah. It must be some years back indeed; look at them they are all grown up. Did you know anything about the digester?

**Interviewee**: No, I did not know about digesters, and I had never heard of it too.

**Interviewer**: Oh, I can imagine it was tough to explain all that to you.

**Interviewee**: No, they just say they were bringing a thing, which I was going to use for cooking.

**Interviewer**: OK what were you expectations?

**Interviewee**: I was excited because I expected to stop fetching firewood.

**Interviewer**: What else did you expect?

**Interviewee**: We expected to benefit.

**Interviewer**: What do you mean?

**Interviewee**: We expected people to be happy when you using it, so it was a blessing (gift) to us.

**Interviewer**: After installation, what did the installers say you should expect from the digester?

**Interviewee**: They just said we would be using it for cooking.

**Interviewer**: Uumh

**Interviewee**: Uh

**Interviewer**: Cooking what?

**Interviewee**: Cooking all types of food.

**Interviewer**: Beans?

**Interviewee**: Yeah, beans. But, I did not cook beans on it, only vegetables.

**Interviewer**: Why?

**Interviewee**: We thought it was going to take time to cook beans on it.

**Interviewer**: You thought, or it took long when you tried to cook beans?

**Interviewee**: Yeah, it took long when we tried to cook beans.

**Interviewer**: Like how long?

**Interviewee**: eh, we did not manage to cook beans because when it run out of gas. So, to use it again we had to feed it again for it to start producing gas.

**Interviewer**: Mmh, okay. What kind of training did you receive?

**Interviewee**: We did not receive any type of training. They only came to install it, and they did not train us whatsoever.

**Interviewer**: If they installed it without training, then how were you able to switch it on and off?

**Interviewee**: They only told us how to prepare feedstock. For example, how much water we were supposed to add to the cow manure, and how to switch it on and off. So, when we wanted to cook we simply switched it on. And when we saw that the stove was switched on but no gas was not coming after feeding it we just stooped because know what to do as we did not receive training.

**Interviewer**: Anything else?

**Interviewee**: That is all

**Interviewer**: What did they say about feedstock?

**Interviewee**: They said the digester needed feedings. It needed to be fed with fresh manure. And, we needed to mix with feedstock with water before pouring it into the bag.

**Interviewer**: Okay, we will talk about that in detail later. Did you feel you could operate with a digester with what your told training?

**Interviewee**: Yeah, we thought we could operate it.

**Interviewer**: You were just told how to switch it on and off, and how to make feedstock, so how?

**Interviewee**: Because after everything, the installers only told us that it only needs feeding to produce fire, and they told us how to feed it.

**Interviewer**: Okay, okay. They told you how to feed it and you were doing it accordingly?

**Interviewee**: Yeah, yeah.

**Interviewer**: Some of the people I have visited were given the digester twice. How many times did you receive digester?

**Interviewee**: We only received money once.

**Interviewer**: I understand the first time they installed digester bags of low-grade plastic that did not work. Then, after a year or so the installer installers this kind of digesters…

**Interviewee**: No, they only installed this one here. It is only this one.

**Interviewer**: Okay, how did you meet your energy needs before the intervention?

**Interviewee**: We were very much struggling and we are still struggling because we source wood from a very far please.

**Interviewer**: Where?

**Interviewee**: The Mountains you are seeing; that is where we get wood.

**Interviewer**: When you leave at 10 AM, what time do you return?

**Interviewee**: We return at 10 AM when you go there.

**Interviewer**: After leaving what time?

**Interviewee**: Five in the morning.

**Interviewer**: Oh, is that true?

**Interviewee**: Yeah [strong affirmative]

**Interviewer**: All that time to find firewood?

**Interviewee**: (laughs heavily) yeah – we return around this time; it is far and the paths are winding and bad.

**Interviewer**: You have trees here, why cannot you just get what from here?

**Interviewee**: Getting firewood from mango trees? No, that’s our fruits, and they save us some other times.

**Interviewer**: In a week, how many times do you go source firewood?

**Interviewee**: Firewood is very scarce these days, so we got there three times a week.

**Interviewer**: How many people?

**Interviewee**: Two; me and my little sister here.

**Interviewer**: Why do you leave that early as you are going to the farm? Don’t you feel vulnerable?

**Interviewee**: We go early to escape from the scorching heat. Also, we need to go there early, so that we can come in time to cook morning food.

**Interviewer**: Did you pay for firewood there?

**Interviewee**: No, we do not.

**Interviewer**: Do you use charcoal?

**Interviewee**: Yeah

**Interviewer**: Do you buy?

**Interviewee**: Yeah

**Interviewer**: In a month, how many bags of charcoal do you use?

**Interviewee**: We use three bags since our family is huge.

**Interviewer**: How many people are you in this family?

**Interviewee**: We are 16.

**Interviewer**: Oh, that is a lot of people; you may need the three bags or even more. Do you differentiate cooking on firewood and biogas?

**Interviewee**: It’s faster to cook on biogas than on firewood.

**Interviewer**: How do you exactly compared the two in terms of cooking time, let’s take nsima for example?

**Interviewee**: It takes less than 30 minutes to cook on biogas, and it takes about 45 minutes to cooking nsima on firewood, and it take even longer to cook nsima on charcoal. It takes one hour or so to have everything ready on charcoal.

**Interviewer**: Do you difference the taste of food cooked on biogas and on firewood? Some people say chips fried cooked on firewood taste better than that cooked on charcoal or a cooker.

**Interviewee**: It tastes the same.

**Interviewer**: Where did you get manure for your biogas?

**Interviewee**: From our cow house.

**Interviewer**: How many cows do you have?

**Interviewee**: I have 16 cows.

**Interviewer**: Oh, that's a lot. How many did you have when the digester came?

**Interviewee**: We had 10 cows. We could have had more than 16 cows but we have sold some of them.

**Interviewer**: How did you manage feedstock before the intervention?

**Interviewee**: We used the cow as fertilizer in our fields.

**Interviewer**: Where are your fields?

**Interviewee**: Within in the house.

**Interviewer**: In a month, how many bags where you making the time?

**Interviewee**: It’s a lot of manure.

**Interviewer**: Like how much?

**Interviewee**: A lot and it’s not like I am the only person who get manure from the cow house. A lot of people within the community come to get manure from my cow house – a lot of them.

**Interviewer**: Okay, do you sell?

**Interviewee**: No, we just give them free.

**Interviewer**: Why? That’s a business opportunity.

**Interviewee**: No, we just feel like helping others so that they can be assisted with their crops too (Laughs)

**Interviewer**: (laughs) you are missing a business opportunity, I’m just saying. Do you add organic fertilizer to boost the manure?

**Interviewee**: We don’t add inorganic fertilizer.

**Interviewer**: Say you don’t buy fertilizer?

**Interviewee**: Yeah, our fields are fertile so cow manure is sufficient.

**Interviewer**: Have you ever used inorganic fertilizer before?

**Interviewee**: [no response]

**Interviewer**: Is it possible to grow maize in Malawi without fertilizer?

**Interviewee**: Yeah. But at one point, we were growing tobacco and that’s when we were using inorganic fertilizer.

**Interviewer**: Why did you use inorganic fertilizer instead of cow manure for tobacco?

**Interviewee**: Cow dung as fertilizer is not suitable for tobacco. It’s not strong enough for tobacco. But, it suits perfectly with maize.

**Interviewer**: Before the digester starts working, you feed it with a huge amount of feedstock and water to start up. How much money and water did you start it up with?

**Interviewee**: I can only remember the amount of water that we added to the feedstock. It was 5 basin of water.

**Interviewer**: Which basin?

**Interviewee**: That one

**Interviewer**: Oh, a 6- liter basin. How much manure did you use?

**Interviewee**: Mmh, I don't know.

**Interviewer**: How come you remember the amount of water that you used, and not the manure you used?

**Interviewee**: It's because my husband was the one responsible for preparing the feedstock; I did not take part in the mixing. I was only involved in gathering the water.

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

**Interviewee**: It took two weeks.

**Interviewer**: Okay, so after two weeks you started using it. How did it work after commissioning?

**Interviewee**: But, before commissioning it, we were told to wait for the bag to produce gas. After two weeks, the bag got full, then we tried it, and it produced fire.

**Interviewer**: Who tried it? Were you just told me how to start it up, or installer were there too?

**Interviewee**: The installers came to try it and to give us a heads up.

**Interviewer**: Okay, so after commissioning how did it work? How much cooking time did you get? Were you able to cook three times a day?

**Interviewee**: Not the whole day, it had time limits.

**Interviewer**: What was the limit?

**Interviewee**: It was starting to work after 10 AM because around that time the bag was full and had gas to use for cook dish lunch. And, at around 1 or 2 PM, the bag would deflate that it was producing very, very little or no gas, and then it would not produce gas any more.

**Interviewer**: And, this was after commissioning. You were able to cook lunch. How much cooking time are we talking about?

**Interviewee**: Around 1 or 2 hours of cooking time.

**Interviewer**: Were you able to use after 1 or 2 PM?

**Interviewee**: No, after those 2 hours we were waiting for the following day to use it again, around 10 or 11 AM.

**Interviewer**: You said you couldn’t remember the amount of manure you use to start it up. But you remember to used five basins (60 liters) of water to start it up. Where did you get the water and the man?

**Interviewee**: We got the water from a borehole within the community, and as for the manure, we got from our cow house.

**Interviewer**: How far are you from the water source?

**Interviewee**: Not far, it’s just there [100 – 200 meters].

**Interviewer**: After commissioning, how often did you feed it? And, how much did you feed it?

**Interviewee**: We were feeding it every morning because they told us to use cow manure. So, every morning before the cows went for grazing we were getting the fresh manure for feeding it.

**Interviewer**: Daily?

**Interviewee**: Yeah, everyday.

**Interviewer**: Yow much feedstock?

**Interviewee**: Five or six buckets (20 liters) of fresh cow manure.

**Interviewer**: How much water did you add?

**Interviewee**: We usually used 3 or 4 buckets of water.

**Interviewer**: How did you prepare the feedstock?

**Interviewee**: We were mixing cow manure and water with hands, and then feed the thoroughly mixed slurry into the digester.

**Interviewer**: So, you were doing that with gloves?

**Interviewee**: No, just with bare hands – there installers didn’t bring gloves.

**Interviewer**: Did you feel gross?

**Interviewee**: Ah, on, we wanted development.

**Interviewer**: Do you have to do uncomfortable things in the name of development? Should development be a burden (Laugh)?

**Interviewee**: (Laughs) No.

**Interviewer**: You are saying you were mixing the feedstock with water. Who was responsible for feeding it?

**Interviewee**: My husband.

**Interviewer**: (Laughs) that’s why you are saying you go the extra mile when it`s development because it wasn’t you handling the feedstock, right? (Laughs)

**Interviewee**: [no response]

**Interviewer**: Was it only him?

**Interviewee**: No, the children supported him as well.

**Interviewer**: How did you feel about it?

**Interviewee**: It was not a problem too, because most of the times we were drawing water.

**Interviewer**: How many people used the gas?

**Interviewee**: It was 16 people

**Interviewer**: This thing produces fertilizer, did they tell you about fertilizer?

**Interviewee**: Yes, they did.

**Interviewer**: What did they say?

**Interviewee**: They said when it is a full it produces digestate, and indeed when it was full, it was producing digestate which we used as fertilizer in our farm.

**Interviewer**: How often was it releasing digestate?

**Interviewee**: When the bag was full.

**Interviewer**: Daily?

**Interviewee**: It was producing the digestate daily long as it was feed and full. So we used to get the digestate and use it in our farms.

**Interviewer**: How was your outlet like? Was it just a hole or you put a basin?

**Interviewee**: We simply dug a hole so that digestate would fall into the hole.

**Interviewer**: How big was the hole?

**Interviewee**: I think it was one meter. So, we were waiting for the hole to fill up to take the digestate to the farm. Mostly the hole was the filing up in two or three days.

**Interviewer**: Were you selling the digestate?

**Interviewee**: No people were just coming to get it.

**Interviewer**: Oh, you people are givers. How did the people feel about feeding it?

**Interviewee**: They were not complaining because they wanted the innovation.

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

**Interviewee**: It just requires constant feeding like I said earlier on.

**Interviewer**: What else?

**Interviewee**: Nothing else.

**Interviewer**: What was to happen if there was a pipe burst or a leakage?

**Interviewee**: They did not train us anything regarding that. They just said that if there was a problem we should consult the extension workers.

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

**Interviewee**: It did not meet our needs because we were not able to cook some of the things.

**Interviewer**: So you were using both firewood and the digester?

**Interviewee:** [response inaudible]

**Interviewer**: Oh, that was tough. What were the challenges?

**Interviewee**: The challenge was that sometimes when we put the pot on the stove; it could not even heat up. Therefore, we used to go around searching for firewood so that we could continue cooking. Sometimes, around 11AM we could see the bag was full, but no gas was coming at the stove despite feeding it with manure and loads of water. Sometimes, it would produce very little gas would make the food became uncooked. So, they fire could come, but it was very weak just like of a candle light.

**Interviewer**: So what were you doing to make the gas strong again?

**Interviewee**: On some particular day, you would just put a pot and you would get strong fire. So, it depend on what particular day it was. So, yeah, sometimes we could cook nsima on it. However, sometime even if we fed it and the bag was full, it could not just produce gas.

**Interviewer**: How long did it work before it stopped working?

**Interviewee**: Two years.

**Interviewer**: So in two year you were just using it in the afternoon? And, sometimes you could not even cook on it because there was no gas?

**Interviewee**: Yeah.

**Interviewer**: Was there a day you used it in the morning, in the afternoon, and in the evening?

**Interviewee**: No. That’s was just not possible. It was starting to work after the sun was out around 10:00 and 11:00 in the morning.

**Interviewer**: What days were you able to cook? Was it random or there was something about those days?

**Interviewee**: It was just random. Sometimes, it would work for a straight one week without problem [just in the afternoon].

**Interviewer**: So general in the 2 years, most times the gas was coming at the stove, it is just that some days the fire was very, very weak; and on some days, and sometimes the fire was good?

**Interviewee**: Spot on!

**Interviewer**: But, after 2 years, that is when it stopped producing gas?

**Interviewee**: Yeah, it stopped producing fire completely.

**Interviewer**: When it was not working properly like the times it was producing little gas did you call the project implementers?

**Interviewee**: We reported the issue to the extension worker and he told us that he would inform the installers. But, they never came up to the point it completely failed.

**Interviewer**: Did you follow up again?

**Interviewee**: No.

**Interviewer**: Why did you not keep on follow up?

**Interviewee**: Aah, we thought the message was clear, and you cannot go to their office all the time because they were occupied with other work as well.

**Interviewer**: What do you think about this kind of information and do you think it would have helped you?

**Interviewee**: The information would have helped us because you could just have been referring to it whenever we had a problem to fix it. And maybe if we had that information it could have been working even today.

**Interviewer**: Why are you so confident?

**Interviewee**: Because we were very committed to feed it, and our feeding was perfect. And, when we had no cow manure, we were going to our uncle, that house there, to get feedstock to feed it.

**Interviewer**: How do you describe the current state of digested today?

**Interviewee**: It is no longer in existence. It is not there.

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

**Interviewee**: The way it was behaving, it was as if we were working for nothing; also, the bag got a hole. Then after that, it got buried in the ground. So the time it was producing very little gas it had no hole anyway?

**Interviewer**: How did it get punctured? And, what kind of hole was it?

**Interviewee**: The bag got puncture on its own underneath while it was in the hole. So, when we were feeding it the bag was not getting full.

**Interviewer**: How did you know that it had punctured?

**Interviewee**: It was because the bag could not get full even after feeding. Previously, we wanted to find out how much gas was in the bag, we used to ask the children to jump on the bag. So that time when the children jumped on it, they stopped bouncing and they were going down with it.

**Interviewer**: Who told you that children should be stepping on it to check if there was gas?

**Interviewee**: They did not tell us but we started doing that ourselves to know if there was gas in the bag or not.

**Interviewer**: (laughs) why do you think it got punctured? Or, what specifically punctured it?

**Interviewee**: Mmh, we do not know.

**Interviewer**: You cannot think of anything?

**Interviewee**: We cannot.

**Interviewer**: How to meet your energy needs now that it is not working?

**Interviewee**: We use the firewood and charcoal. Nowadays, we eat very late because it takes us time to find firewood; we eat very late these days.

**Interviewer**: (laugh) is there anything wrong with eating late?

**Interviewee**: There is problem, because when we go to farm in the morning we go with empty stomachs, so we expect that we should eat right after returning – so we see that as a problem.

**Interviewer**: I am having lunch here today, what time are we eating?

**Interviewee**: We have already eaten.

**Interviewer**: You are telling me you eat late, but this is 1:30 PM and you have already eaten.

**Interviewee**: (laughs) we didn’t go to the farm today.

**Interviewer**: How many times do you eat in a day?

**Interviewee**: We eat twice.

**Interviewer**: How do you manage the feedstock now that it is not working?

**Interviewee**: It’s in the cow house now waiting to be taken to the farm.

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

**Interviewee**: We don’t know how much it cost, but it must be a lot. And, on our side, we lost a lot of money too in terms of paying the people who dug it, and also for building a wall around it. On top of that, we built the kitchen to block the wind from the stove.

**Interviewer**: Who paid for the kitchen?

**Interviewee**: It was them.

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

**Interviewee**: The cow manure was ours.

**Interviewer**: What else, bricks?

**Interviewee**: The bricks were ours.

**Interviewer**: How much money did you spend on that?

**Interviewee**: It was K6000.

**Interviewer**: Did it save you money the time it was working?

**Interviewee**: Yeah… It helped us to save the money that we were spending on charcoal.

**Interviewer**: So, you reduced buying charcoal?

**Interviewee**: No, we stopped completely. We were using firewood and biogas only; when it stopped, that’s when we started using charcoal. And, because we want to cook fast, we put one pot on firewood for side dish, and another pot on charcoal… So we started using charcoal when it failed.

**Interviewer**: You said you were only using it in the afternoon, so how were you cooking that time?

**Interviewee**: We were using firewood when biogas was not working.

**Interviewer**: So your primary source of energy is firewood?

**Interviewee**: Yeah.

**Interviewer**: So, that time you were saving three bags of charcoal?

**Interviewee:** [response inaudible]

**Interviewer**: How much was a bag of charcoal that time?

**Interviewee**: It was K4500.

**Interviewer**: How much is it now?

**Interviewee**: It’s K6000 or K7000

**Interviewer**: Oh, things are expensive now, uh. What was the biggest difference in your life that time it was working?

**Interviewee**: This were a bit easy that time; and our school going kids were finding food ready after knocking off from school. It was like after knocking off at 12 noon they would find food. But now it’s tough. And, one thing about the digester is that we knew its cooking time, so we were forced to cook within that particular time, and that`s why the children always found food ready.

**Interviewer**: Oh, I see. We are remaining with two questions, what is your opinion of biogas?

**Interviewee**: If you could bring another biogas, then you should take us to training so that we should learn about it. And, the training should focus on how to fix it, and even how to make it work in the evening. I think that way it can work.

**Interviewer**: What are its props and cons?

**Interviewee**: The good thing about it is that you eat on time. The other thing was that it was a new thing in this community. So, to have it was special because we felt that we were above everyone. And, it made this house like a learning center, because many people were coming to learn about it, and they admired it. The main challenge though is the feedstock, sometimes we had to get a bucket or too from our uncle.

**Interviewer**: What is the future of biogas in Malawi? Is the future bright or groom?

**Interviewee**: The future is bright, like I said many people were coming to see it, and they showed interest.

**Interviewer**: We are in 2022, you had it in 2016-17, and you are telling me that people wanted it but no one today has it, even you yourself don’t have it. So, how is the future bright?

**Interviewee**: They didn’t tell us that after it has stopped working, we could buy it in the shops, or what can we do after. Also, we didn’t go for training, so we can’t advocate someone to buy it because we may fail to help him or her if it fails…. So, it’s hard.

**Interviewer**: So, for it to have a future there must be training?

**Interviewee**: Yeah, because after that that’s when you can be telling people to do this and that, and only them you can spark the interest in people. People were asking a lot of questions but we were failing to answer, so how could we tell them to buy it or how could they have been convinced by us when we seemed not to understand it.

**Interviewer**: What questions were you receiving?

**Interviewee**: People were asking us how we got it; and what they can do to get it; and where to get it – lots of questions. But we had no responses to these questions. We were just telling them that they told us to feed it with cow manure (Laughs). And then we would take them to the stove to show them the gas.

**Interviewer**: (laughs) if you would have design your on the waste or energy intervention, what could you have chosen instead?

**Interviewee**: We are not educated so we don’t know which technologies we can use or are available… we only saw them bring this technology and we accepted it.

**Interviewer**: (Laughs) you don’t electricity?

**Interviewee**: We want that.

**Interviewer**: Why didn’t you tell me that?

**Interviewee**: (laughs) yeah, electricity can help a lot too.

**Interviewer**: That was my last question. Thanks for the interview.

**Interviewee**: Thanks for coming too.