**BIOGAS ASSESSMENT PROJECT**

**Site ID: 21**

**Date: July 26, 2022**

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

**Interviewee**: The installers came when I was at school, so I just found it here.

**Interviewer**: So you can’t know how many people installed it?

**Interviewee**: Yeah, I can’t know.

**Interviewer**: You don`t even who provided the money, and how much was involved to build it?

**Interviewee**: It’s not a lot. We just contributed cow manure.

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

**Interviewee**: I can say it was just lucky or something, because only a few people received the digester here.

**Interviewer**: I mean we have many households in this village, so how did it all happen? What made you say it was lucky?

**Interviewee**: It`s hard to tell, so I’ll just say it was lucky.

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

**Interviewee**: No

**Interviewer**: Okay, so what were your expectations when you find out that it was coming?

**Interviewee**: We expected to see change.

**Interviewer**: What change?

**Interviewee**: Like we would be in a position to cook using a modern technology of cooking.

**Interviewer**: Apart from that, what else?

**Interviewee**: We also expected to benefit.

**Interviewer**: Okay, like how?

**Interviewee**: Like to be able to cook things fast.

**Interviewer**: Okay, what did the installers told you to expect from the digester?

**Interviewee**: They told us to expect to cook our things fast especially if we were going to feed it accordingly - They said it works fast if it's fed appropriately.

**Interviewer**: So, what was the appropriate way of feeding it to ensure that it was working fast?

**Interviewee**: They told us to mix cow manure with water, like if it was a bucket (20 kg) of cow manure water, then water was supposed less than cow manure.

**Interviewer**: Okay, what kind of training were you given by the installers?

**Interviewee**: I think they took my father to some place to learn about the digester.

**Interviewer**: Where?

**Interviewee**: He was taken to one of the beneficiary who was given the digester before us to see how they were doing it. In this community, only two people were given the digester, and after they installed it here, the other beneficiary came to learn from us as well.

**Interviewer**: So, it was like after installing the digester at the other person’s home, you were asked to go there to learn one or two things. Moreover, after finishing installing the digester here, the other digester they were called to learn from your digester?

**Interviewee**: Yeah

**Interviewer**: Were you available around that time?

**Interviewee**: Yes, I was.

**Interviewer**: I would imagine that you did not go there, did you?

**Interviewee**: No, my father only went there.

**Interviewer**: What did your father tell you about that training?

**Interviewee**: He didn’t tell me anything.

**Interviewer**: Were you present when they were conducting the training here?

**Interviewee**: Yeah, I was there.

**Interviewer**: So what was the training like? Tell me more about the training?

**Interviewee**: Many people came, and it was good because the installers made it clear that the digester was installed here for others to see and adopt in their home. However, that time people would to play for the digesters. So, yeah, many people from the village that came to see how it works.

**Interviewer**: Like how many people came?

**Interviewee**: It was many people, probably around 20 to 30 people.

**Interviewer**: What was then the training like? What happened during the session and what did they say?

**Interviewee**: It was about showing people how it works and how to manage it. So, people were shown how to feed it. They also talked about how gas is produced in the digester bag. People were shown how to turn on the gas stove, and people saw the flame on the stove.

**Interviewer**: So after the training, how prepared to run or operate the reactor did you feel were?

**Interviewee**: Yeah, I thought I was going to be able to operate it without issues. Unfortunately, it only worked for some days and stopped.

**Interviewer**: Okay will talk about what caused it tofail, how long did it take it to fail. Nevertheless, for the time being, let’s talk about the training, how long did the training take?

**Interviewee**: It was for a day

**Interviewer**: Like for how many hours?

**Interviewee**: It was from morning to afternoon.

**Interviewer**: Like at one point you had to break for lunch break or something?

**Interviewee**: Aah, no. After the training, everyone went home.

**Interviewer**: So how long was it specifically?

**Interviewee**: We started in the morning, like 9 AM and stopped before noon.

**Interviewer**: So you did not ask for it or wanted it?

**Interviewee**: We did want it because we never knew it.

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

**Interviewee**: Firewood.

**Interviewer**: Where did you get the firewood?

**Interviewee**: Just searching around the woodlands. Sometimes we buy wood. Sometimes we buy charcoal.

**Interviewer**: How much firewood do you buy?

**Interviewee**: We buy wood at K1000 per bundle. We use that to cook everything for a day. But, in truth, we rarely buy wood.

**Interviewer**: Charcoal?

**Interviewee**: We buy probably one to three bags of charcoal a month. One bag costs around K5000 now; it was K2000 something that time.

**Interviewer**: Where did you get cow manure?

**Interviewee**: At first, we had our own cows, but we sold them. So, we were getting cow manure from someone else.

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

**Interviewee**: Almost 15 cows.

**Interviewer**: So, when you received the biogas you had 15 cows?

**Interviewee**: Yeah, we had 15 cows.

**Interviewer**: How did you manage cow manure before the intervention?

**Interviewee**: We were using manure in our farms.

**Interviewer**: How were you doing all that? Where you just getting the cow manuredirectly to the farm?

**Interviewee**: We were gathering cow manure from the cow house to one place within the house to dry. After sometime, we were getting the manure to the farm.

**Interviewer**: Okay,okay. How much manure were you producing?

**Interviewee**: A lot of manure, maybe 10 bags.

**Interviewer**: Within what period?

**Interviewee**: Maybe in two or three months.

**Interviewer**: How do you differentiate cooking with biogas from firewood or charcoal?

**Interviewee**: The only difference is speed. Biogas is faster because it produces strong heat - It’s different.

**Interviewer**: Let’s say we are cooking nsima for four people on biogas, how long would it take to get it all done?

**Interviewee**: 15 to 20 minutes

**Interviewer**: If we were cooking the same nsima wood, how long would it take?

**Interviewee**: Maybe 30 minutes.

**Interviewer**: How many were you in your family then?

**Interviewee**: Four people.

**Interviewer**: Ummh, during inspection, my colleague asked you how much manure did you used to start it up, and you said you used 20 buckets of feedstock of which 10 buckets was cow manure, and the other 10 is water. How long did the digester take to start up after that?

**Interviewee**: It took two weeks.

**Interviewer**: How did it work after commissioning? Or, how much cooking time were you able to get after those two weeks?

**Interviewee**: Were able to cook from morning to evening.

**Interviewer**: Without issues?

**Interviewee**: We had issues in the afternoons but it was picking up after a short time – and it’s not as if we used it for long; we were only able to cook on it for only a few days.

**Interviewer**: How many days specifically? And, what was the problem?

**Interviewee**: When we started it up it was going off. Then, we would start it up again and it would go off again. Then, we called the extension worker who told us to keep on feeding it more and wait for some time. We did that but it never worked after that - and that was the end of it.

**Interviewer**: How many people were using the gas?

**Interviewee**: It was the whole family.

**Interviewer**: Okay, what were the operation requirements?

**Interviewee**: We only needed cow manure.

**Interviewer**: How did you prepare the feedstock? How did you make it all work?

**Interviewee**: We used to place cow manure into a bucket and add water. After that, we used to mix the contents. Then, we would pour the mixture in the digester. After that, we would get another bucket of cow dung and add water, and then mix.

**Interviewer**: Okay, okay. Who was responsible for feeding it?

**Interviewee**: It was my mother and I, and sometimes my father.

**Interviewer**: How often did you feed it?

**Interviewee**: We were feeling it in the morning and late in the afternoon.

**Interviewer**: Oh, like daily?

**Interviewee**: Yeah, it was daily. It’s not as if the first 20 buckets got it full.

**Interviewer**: Oh, I’m not clear on this. After you feed it with 20 buckets of feedstock, how often did you feed it after that?

**Interviewee**: Okay, after feeding it for the first time we waited for two weeks for it to start up. After it started working, we did not feed it. It only worked for few days and after that, it completely stopped. And that’s when we were told to feed it heavily and that was a week after commissioning it.

**Interviewer**: How much feedstock?

**Interviewee**: They told us to feed it with 30 buckets bag of feedstock of which 15 buckets was cow dung and other 15 was water. And, during this time, we were told not to use it, and wait for it to restart.

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

**Interviewee**: It worked for three days.

**Interviewer**: (laughs) and after those 3 days, what happened again?

**Interviewee**: It never worked – and that's why they told us to feed it week by week, and see how it was going to respond. Sadly, it never worked even after trying to feed it as we are told.

**Interviewer**: And that was the end of it. It never worked again?

**Interviewee**: That was the end of it. It never worked again.

**Interviewer**: Oh, how many times did you feed it after it stopped working?

**Interviewee**: We fed it four times in 4 weeks.

**Interviewer**: How much did you feed it on each feeding?

**Interviewee**: We feed it with 30 buckets of feedstock each time, but it never worked after the four weeks.

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

**Interviewee**: That was the responsibility of the extension worker. We were only advised to call him whenever there was a problem.

**Interviewer**: Were you training on maintenance or how to fix it?

**Interviewee**: No, that was the duty of the extension worker - he was solely responsiblefor fixing it.

**Interviewer**: How many times did you call the extension worker and for which problems?

**Interviewee**: We only called him after it stopped working.

**Interviewer**: How did he respond?

**Interviewee**: He came the very day. He stays around the community. He lives near the trading center.

**Interviewer**: That’s [name redacted]?

**Interviewee**: Yeah, he’s [name redacted].

**Interviewer**: So after it stopped working, you called [name redacted] to come to fix it. He came and told you to feed it once every week for four weeks. And during this time, he told you not to use it?

**Interviewee**: Definitely!

**Interviewer**: During the training you had with other people, the installers did not address issues regarding maintenance at all?

**Interviewee**: No, they didn't talk about maintenance.

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

**Interviewee**: It wasn't a problem; feeding it once in a week wasn’t a problem. But, it was only tiresome to gather the manure.

**Interviewer**: So, in the three days it worked, did it meet your needs?

**Interviewee**: Only the first day, yeah!

**Interviewer**: The second day?

**Interviewee**: It worked but it went off whilst cooking. Still, we were able to cook side dish of fish [20 – 30 minutes]. It was only okay on the first day.

**Interviewer**: Thanks, what challenges did you encounter?

**Interviewee**: The problem was that it was on and off from the onset; it only worked on the first day. So, that was the problem.

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

**Interviewee**: It stopped producing gas while cooking.

**Interviewer**: How did it all stop? I mean it worked on the first day, on the second day you had issues. Take me through the three days? Describe for me those three days, day by day?

**Interviewee**: On the first day, it worked quite okay. On the second day, it worked, stopped producing gas and then it produced gas, then it stopped. On the third day, it started working then stopped and since then it has never worked again.

**Interviewer**: So after it stopped working you called [name redacted], who told you to feed and wait for it to pick up. Oh I see. Have you seen something like this before?

**Interviewee**: No.

**Interviewer**: What do you think of this information and do you think it would have helped in your case?

**Interviewee**: Yeah, it would have helped as it would because it would have given us knowledge on maintenance and most of all it that would have been our reference.

**Interviewer**: Why didn’t you ask him to give you something like this? Why did you bring the issues of maintenance to them?

**Interviewee**: Because the digester was in its infancy stage. After fixing the problem that killed it, we wanted to ask them to train us on maintenance, so that we could fix some of the problems on our own without needing their help. As you know, they can’t always be here all the times. Sometimes they are busy, so in such times we would have been using the knowledge and skills to fix it in their absence.

**Interviewer**: Okay, how would you describe the current state of your digester?

**Interviewee**: The way I see it, it’s dead.

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

**Interviewee**: Because the bag is broken, the pipes and stove is scattered, but we still have desulpher bottle.

**Interviewer**: I can’t see any of that, why did you remove the equipment?

**Interviewee**: After the bag deflated, it created a hole that became dangerous for the kids who likes to play within the compound. So, it was really dangerous for the kids especially in rainy season when it got filled with water. So to prevent accidents we just removed the digester bag and that's you don’t see the bag.

**Interviewer**: Okay, what do you think caused its failure?

**Interviewee**: Ah, I can’t know.

**Interviewer**: Okay, what do you think?

**Interviewee**: It’s hard to know because it just stopped working. So, when it stopped we thought the feedstock was inadequate. But, when we fed it again with large amounts of feedstock, it never worked. So, it’s hard to know.

**Interviewer**: What makes you say that? What made you think the feedstock wasn`t enough the first time?

**Interviewee**: It started with low pressure.

**Interviewer:** But you were told how much you were supposed to feed it. So, do you think the installers gave you wrong information?

**Interviewee**: (laughs) I don’t know. But, I just feel like it was not adequate.

**Interviewer**: Okay, now that it is not working, how do you meet your energy needs?

**Interviewee**: We have gone back to charcoal. We use charcoal to cook now.

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

**Interviewee**: We don't use cow manure.

**Interviewer**: You told me you had 15 cows that time. Where is the cow now?

**Interviewee**: It is all gone now.

**Interviewer**: How?

**Interviewee**: We had problems.

**Interviewer**: (laughs) what do you mean when you say you had problems?

**Interviewee**: We had no money at some point, so we decided to sell the cows. We couldn’t have suffered when we had cows. So, we got cow manure from somewhere.

**Interviewer**: (laughs) I’m not clear on this. You said after commissioning it only worked for 3 days right?

**Interviewee**: True.

**Interviewer**: After commissioning, you fed it four times in a space of four weeks. I presume you had cows that time. So, why were you getting cow from other people?

**Interviewee**: After it stopped working, we got our manure from other people, because that time we had sold the cows.

**Interviewer**: So, you mean you sold the cows some days prior or after the commissioning it?

**Interviewee**: We sold the cows the time we started using it because encountered a certain problem, yeah.

**Interviewer**: How many cows did you sell that time?

**Interviewee**: We should five cows at once.

**Interviewer**: Then?

**Interviewee**: Then, we sold four cows.

**Interviewer**: How long did it take you the nine cows?

**Interviewee**: We sold the cows in a space of a week.

**Interviewer**: So you mean after they installed this, your had challenges that forced you to sell 9 cows?

**Interviewee**: Yeah

**Interviewer**: Is this true?

**Interviewee**: Yeah, it’s true. Do you think I can be lying, what for?

**Interviewer**: What problems you faced?

**Interviewee**: Some family problems.

**Interviewer**: Did you consider that selling the cows was going to impact your digester?

**Interviewee**: Yeah, but at that time we had no option other than sell the cows.

**Interviewer**: Where did you get the cow manure?

**Interviewee**: From [name redacted], he lives somewhere there.

**Interviewer**: Not far, 200 meter from here. Did you buy?

**Interviewee**: No, we just gave him K10000 to have unlimited access to the cow manure; and it wasn’t like he specifically asked for that. So, I don’t see it as we bought him.

**Interviewer**: Okay, nice. Where did you get the water for feeding this?

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

**Interviewer**: How far from here?

**Interviewee**: From here to that mango tree

**Interviewer**: This is roughly 500 meters. Did you contribute anything in kind?

**Interviewee**: Everything was brought by the installers.

**Interviewer**: Which organization?

**Interviewee**: I don’t know the organization, like I said, I wasn’t around when they brought this. I was a school that time.

**Interviewer**: So, you cannot know how many people birth this?

**Interviewee**: No, I can’t no.

**Interviewer**: But your dad knows?

**Interviewee**: Yeah, he knows

**Interviewer**: What is the biggest difference now that you don’t have there the digester?

**Interviewee**: Things take time to cook now.

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

**Interviewee**: I think it’s better if we can bring another digester if it is possible.

**Interviewer**: (laughs) if another digester comes, will it not fail as the last one?

**Interviewee**: Maybe, it can be different from that.

**Interviewer**: How different?

**Interviewee**: In terms of its performance; maybe that one will work.

**Interviewer**: We have three questions to finish the interview. What is the future of biogas in Malawi?

**Interviewee**: I don’t see it progressing so this will make more Malawian to continue using firewood

**Interviewer**: Why and what should be done to make this work?

**Interviewee**: As for us, we just need a new technology, because we don’t have cows. So, it will need money for us to continue using it. Thus, many people who don’t have cow can’t manage it because it may need money to run.

**Interviewer**: If you could have designed your own energy or waste intervention, what would you have chosen instead?

**Interviewee**: Aah, we know people use electricity to cook.

**Interviewer**: So, you want electricity?

**Interviewee**: We would choose any technology to use for cooking which does not require electricity.

**Interviewer**: Why?

**Interviewee**: Electricity is expensive.

**Interviewer**: Okay thanks, that was my last question. Do you have anything to say?

**Interviewee**: No, thanks.

**Interviewer**: Welcome