**BIOGAS ASSESSMENT PROJECT**

**Site ID: 24**

**Date: July 26, 2022**

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

**Interviewee:** It came with [name redacted], the agriculture extension worker – When he came, he identified a place and told us to dig a hole for the digester to be placed. Simply put it came with me our extension worker, [name redacted].

**Interviewer:** When was this?

**Interviewee:**  It has been three years. It was 2018, if not 2017.

**Interviewer:** Who built it?

**Interviewee:** Four people built it; they line the digester with a brick wall; prepared the feedstock to start it up, and of course, draw water to feed it and other things.

**Interviewer:** Who were these four people?

**Interviewee:** It was two us, and two other people; we hired them to assist us with the work.

**Interviewer:** How much did you pay them?

**Interviewee:** We paid them K5000.

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

**Interviewee:** Firstly, they told us to dig a hole, and then build a brick wall around it. Then, they told us to wait for a day to allow the brick wall to dry. The following day, they came and installed the digester bag. They also made a structure for the stove on the same day. All this took three days.

**Interviewer:** I take it that it was not just the four of you, who were involved in the building process. I believe the four of you worked with the people who brought the digester. How many people from the installation of company were involved in the construction or installation process?

**Interviewee:** There was [name redacted] and two other extension workers of which one was short and dark in complexion. On top of this, there were two other people. They were not from this community nor extension workers.

**Interviewer:** Okay**,** what was your role?

**Interviewee:** Our main role was to find people to make a hole for the digester bag and to prepare feedstock to start it up. Besides this, we were also responsible for sourcing bricks for making a brick wall around the hole. Therefore, we went around the community to find a broken bricks for the wall. Nowadays, you cannot do that.

**Interviewer**: Why?

**Interviewee**: People do sell broken bricks these days. It is just not possible to find broken bricks going free of charge like in the past

**Interviewer**: What has changed really?

**Interviewee**: Everything is about money now. In the past, we could go to a brick clamp or a house construction, and get broken bricks free and build a pit latrine. Now people ask for money even for broken bricks.

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

**Interviewee**: It was [name redacted], the extension worker, who identify us. In this community only two people were given the digester, it [name redacted] and I.

**Interviewer**: Why do you think you were chosen? I mean, you are too many people in this community, why you?

**Interviewee**: (Laughs) they chose us because we had cows, I think. There was a cow house there. That is my mother.

**Interviewer**: Hello, mom. Yeah, we are doing a research about biogas. I came in June in preparation of this visit. I hope you were told. Right now, we are just chatting about your experiences with the digester.

**Interviewee**: Yeah, they give me this digester. However, after commissioning, I could only cook porridge and vegetables. After a little time, it stopped producing gas; it was on and off.

**Interviewer**: Okay, then you can join us. I understand it has been many years, so it would be wonderful if you can join us and remind each other some of the things. I was asking my sister here why they chose you to be a beneficiary, and she told me it is because that time you had cows…

**Interviewee**: Yeah, and that is true. It was because of the cows.

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

**Interviewee**: We had 10 cows, but I was not the sole owner.

**Interviewer**: what do you mean?

**Interviewee**: Out of the 10 Cowboys, four were mine. The rest of the cows where brought by other people so that I could keep for them.

**Interviewer**: Why asking you to keep for them?

**Interviewee**: They so that it was secure for them to keep the cows here; they had challenges keeping the cow.

**Interviewer**: How many people?

**Interviewee**: Two people

**Interviewer**: Okay, did you know anything about biogas?

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

**Interviewer**: Sister did you know anything about biogas?

**Interviewee**: No

**Interviewer**: So it was a new thing for both of you?

**Interviewee**: It was a new thing to many; it was not only us.

**Interviewee#2**: and people were coming to see it. I used to show them how to feed it and how the bag gets full after feeding. Moreover, then I would show them how to operate it.

**Interviewer**: Oh nice, did you show them how to cook nsima on biogas and all that?

**Interviewee**: Mmh, no nsima. The firewood was not staying long, by now it could have stopped [referencing the time taken for the interview (about 25 minutes)].

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

**Interviewee**: I thought I was very lucky. In this community, only two of us benefited. So, we accepted the digester because we thought we were lucky to have it.

**Interviewer**: You thought you had hit a jackpot.

**Interviewee**: (laughs) Yeah, so we thought I would use it for cooking. So, we expected to stop going around searching for firewood. We expected to have rest; we expected to take a break from sourcing firewood.

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

**Interviewee**: At the mountains.

**Interviewer**: How far?

**Interviewee**: We leave in the morning and return after 12 or 1 PM.

**Interviewer**: What time exactly in the morning?

**Interviewee**: We leave around 5 am

**Interviewer**: eh, eh, it`s far.

**Interviewee**: Yeah, is very far. The mountain is far from here.

**Interviewer**: I thought you have trees around, why do you not just you use the trees from within?

**Interviewee**: The mango trees? No! The trees give us fruits, my son

**Interviewer**: I understand it is not easy to get wood from mountains. You think of forest officers and everything. How is it like that side?

**Interviewee**: No, it is just like woodland. Plus, we have relatives who own land around, so we ask and get firewood from them.

**Interviewer**: Okay, so when [name redacted] and his team came, what did they say you should expect from with the digester? What did they say about the digester?

**Interviewee**: They build the digester here so that I could use it for cooking – And when things were working I reported to [name redacted]. He came and saw that it was not producing enough; and, he told us that the digester was not producing gas as it was supposed to.

**Interviewee2**: So, when he came that time and saw it producing little gas, we expected him to bring a new digester that we could use without problems.

**Interviewer**: Okay, did they tell you that it could use it for lighting?

**Interviewee**: They did not – This one was only meant for cooking.

**Interviewer**: What type of training did you receive from the installers?

**Interviewee**: They simply told me to feed it with six bags of cow manure. They said after feeding it, I will be able to know that it was good by just looking at how the bag was inflated. And, when the bag was full, they came and they showed me how to switch it on.

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

**Interviewee**: No.

**Interviewer**: What did they tell you to do when the bag was not getting full?

**Interviewee**: They told us to feed it with food leftovers and everything decomposes, and we were doing just that.

**Interviewer**: How prepared to run or operate the digester did you feel were?

**Interviewee**: Very much so. And, we loved the digester, and we embraced it.

**Interviewer**: So you felt what they told you was enough to operate it and maintain it?

**Interviewee**: yeah, that is what we were told, and we thought it was fine.

**Interviewer**: How did you meet your energy needs before the intervention? Did you use anything apart from firewood?

**Interviewee**: Like I said, we get wood from the mountains. So, when this came we are so happy, and thought it was our time to stop going to the mountains to look forward.

**Interviewer**: Now, if you want to cook, do you still go there?

**Interviewee**: Yeah, we still go there.

**Interviewer**: how is the situation there? Is firewood not depleting?

**Interviewee**: it is depleting… Its depleted because of people who go there to cut trees to make charcoal.

**Interviewer**: Then, how are you going to survive?

**Interviewee**: We do not know – You should help us with alternatives.

**Interviewer**: (laugh) oh

**Interviewee**: (Laughs) and as you can see, I am getting old. The last time they cheated to me about using it for cooking, so you need to support me on finding a solution to cooking.

**Interviewer**: Let us assume, I am not there, how are you going to survive?

**Interviewee**: (Laughs) you do not have to disappear. Do not shun us (laughs)! But, if worse come to worse, we will leave with no option, but on depend on maize stalk. But we cannot and do not rely on that, because it is somewhat seasonal.

**Interviewer**: You said you had 10 cows; four were yours and six were from other people. How many do you have now?

**Interviewee**: We do not have any. Thieves stole from us.

**Interviewer**: Oh, true?

**Interviewee**: Yeah, you can even ask the kids. We tried everything to get it back, but couldn't.

**Interviewer**: When was this?

**Interviewee**: Last year. They only left us with one cow.

**Interviewer**: In most cases, people go to tradition witchdoctors after such an event, especially in cow farming. What did you do?

**Interviewee**: Eh, we tried literally everything – And it is not only us, many people from the village were robbed that day. I am sure they used strong juju [black magic], because that cannot just happen. And, when we went to witch doctors nothing happened, so I am sure they used strong juju.

**Interviewer**: Sorry for your loss. How did you manage the feedstock before the intervention?

**Interviewee**: We simply gathered and processed the manure, and later use it as manure in our fields. That time I was able to gather 5 bags (50 kg) of manure, but if a man was doing that, he could have gathering more. So, from that I was able to harvest16 bags (50 kg) of manure.

**Interviewer**: Oh impressive, how much manure did you start it up with?

**Interviewee**: We started with six or seven buckets (20 kg) of cow manure.

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

**Interviewee**: I got it from my cow house.

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

**Interviewee**: We started it with 5 buckets of (20 liters) of water. And, it was lot of work to prepare the feedstock at the first time. But, afterwards it was simple because we were feeding it a bucket or so.

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

**Interviewee**: From a borehole.

**Interviewer**: How far is it from here?

**Interviewee**: So far is there?

**Interviewer**: That is 400 or 500 meters away. How long did it take to start up?

**Interviewee**: It took one week.

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

**Interviewee**: After feeding it with the initial feedstock, we waited for a week for it to start up. During that week, the bag was getting bigger and bigger each day. On the 7th day, it got full. Unfortunately, the gas we got was not strong enough to cook nsima. Like I said, I was only using it for cooking vegetables and porridge or light side dishes [15 – 30 minutes]. And it was always on and off; sometimes we could switch it on and got little gas; sometimes we did not get gas at all.

**Interviewer**: Specifically, how much cooking time did you get when it worked? Were you able to cook breakfast lunch and supper?

**Interviewee**: No, as I said, we could not cook on nsima on it. We only used it for cooking porridge and vegetables.

**Interviewer**: Okay, that is like 15 or so minutes of gas. Apart from cooking, did you use it for any other purpose?

**Interviewee**: No, it was only for cooking.

**Interviewer**: How many people used it?

**Interviewee**: We were 3 people.

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

**Interviewee**: For it to function, it needed to be fed with cow manure. They also told us to feed it with food leftovers.

**Interviewer**: How often did you feed the digester?

**Interviewee**: Once we saw that the bag was not full.

**Interviewer**: So you were basically waiting on it to shrink to feed?

**Interviewee**: Yeah, once we saw that the bag was not going to get full, that's when we were feeding it.

**Interviewer**: Why didn’t you feed it on a daily basis?

**Interviewee**: I do not know if it was laziness, but in most cases it was taking as three or four days to feed it.

**Interviewer**: Did the installers tell you how you were supposed to feed it?

**Interviewee**: They did

**Interviewer**: What did they say?

**Interviewee**: They told us to feed it with cow manure, but my thinking was it was not going to take time provided again or to use it.

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

**Interviewee**: We were simply putting the manure in a bucket, add water, and mix with a wooden stir or stick. After mixing, we were pouring the mixer into the digester bag.

**Interviewer**: Many people have told me that they were advised to use hand instead of stir to have good slurry. What is your take?

**Interviewee**: We were also getting good slurry using a stick because some of the manure was fresh.

**Interviewer**: You were also using dry manure?

**Interviewee**: We were just collecting manure, so some of the manure was dry.

**Interviewer**: Were you pre-treating the feedstock? For example, did you soak the manure for a certain time before feeding it?

**Interviewee**: No, we were just mixing the manure after collecting it from the cow house.

**Interviewer**: What was ratio of your feedstock? I mean, how much water were you adding to the manure?

**Interviewee**: Mostly, I was feeding it with seven buckets (20 liters) cow manure, and I was adding seven buckets (20 liters) of water.

**Interviewer**: OK, So, it was a 1:1 ratio. Who was responsible for feeding it?

**Interviewee**: I was responsible

**Interviewer**: What about my sister here?

**Interviewee**: She was also supporting me

**Interviewer**: How would you describe the task of feeding it?

**Interviewee**: It's hard work. But, it’s worth it, if it can work without issues.

**Interviewer**: In your case, was it worth it?

**Interviewee**: The fact that we did not use it for cooking nsima, it’s hard to say it was worth it. You know in Malawi, eating is synonym to nsima (laughs). Nsima is everything!

**Interviewer**: Did you get fertilizer?

**Interviewee**: The installer told us that after feeding it for some time, it produces digestate that can be used as fertilizer. They also told us that what remain I the bag is fertilizer, so when it stopped we got and used it as fertilizer.

**Interviewer**: What was your outlet like?

**Interviewee**: We dug a hole onto which the digester was flowing in. They told us that we could use the digester as fertilizer, so we used to collect the digestate and apply it in our farms.

**Interviewer**: What was your take on the digestate? How did you compare it with inorganic fertilizer or the fertilizer you where getting from you manure?

**Interviewee**: We don’t use inorganic fertilizer. But, when we used the digestate, it worked.

**Interviewer**: Why don’t you use in organic fertilizer?

**Interviewee**: We can't afford it - we don't have money to buy inorganic fertilizer.

**Interviewer**: Now that you have only one cow. What will you do?

**Interviewee**: My sister has a cow house, so I have moved the remaining cow to her place.

**Interviewer**: So you will get manure from her?

**Interviewee**: I will probably get manure from her.

**Interviewer**: You sound so unsure, I mean, what is the plan now regarding fertilizer now that you don’t cows?

**Interviewee**: I will grow maize without any fertilizer.

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

**Interviewee**: Yeah, I do grow maize without fertilizer. What can I do when I don’t have the money?

**Interviewer**: And you do harvest enough?

**Interviewee**: Of course, we do get low yield. But, what can we do, my son?

**Interviewer**: yeah, I see it’s tough. What were the maintenance requirements?

**Interviewee**: The only told us to feed it, and after that feeding it for a long time, it was going to start producing manure – So that was what I was doing.

**Interviewer**: Did they tell you anything about how to fix or repair it?

**Interviewee**: No.

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

**Interviewee**: Maybe, if it was installed properly, it would have met our needs. And, I think, had it worked as I expected, I would have the happiest person because I expected a lot; I expected it to take away all my cooking problems… I don’t know if it was your team or not, who came to ask me similar questions and gave me three bundles of wood at the end.

**Interviewer**: No, it wasn`t us. It seems it did not meet your needs, because you could not cook nsima and the like, right?

**Interviewee**: Yeah, I couldn’t cook in nsima; if I could have cooked nsima on it, it would have been just one portion of nsima; I couldn’t cook nsima for two people.

**Interviewer**: What challenges were there?

**Interviewee**: It didn’t work us one would do expect. I expected that I could use it for cooking but I never did.

**Interviewer**: Could you describe the fire you were getting?

**Interviewee**: It was produce very little fire green in color. And, it was only producing fire for a very short time, after a short time it was going off completely.

**Interviewer**: How much time was it?

**Interviewee**: Just enough to cook porridge. After cooking porridge, it could not produce fire.

**Interviewer**: Maybe 15 - 30 minutes?

**Interviewee**: Yeah

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

**Interviewee**: It worked for two or three months, after that it stopped completely. Then, I reported to [name redacted], the extension worker, who told me to wait, and hope that the installers would come again.

**Interviewer**: So you only used it for two months.

**Interviewee**: Yeah, it worked for three months. After that, it stopped completely. I don’t know how the other beneficiaries fared though.

**Interviewer**: Most of them they did fare like yours; two months, one month, one week, but there is one who used it for two years.

**Interviewee**: Two years? [Surprised]

**Interviewer**: Yeah, they told me it was only working around lunchtime though.

**Interviewee**: Yeah, that's how it was for all of us. And, when we met and asked each other, the stories were kind of the same.

**Interviewer**: You are saying after it failed you reported to [name redacted], is there anything else you did before you reported to [name redacted]? Did you try to fix it?

**Interviewee**: No, we just reported to [name redacted]. When he came, he just moved around the bag. Then, he said we should just hope that the installers would one day come again.

**Interviewer**: How long did it take him to come after you report?

**Interviewee**: He was quick. He came on the same day. And, when we met him on the road he would tell me not to worry, and that the installers would come one day.

**Interviewer**: We are going towards the end of the interview. We have done 80% of the interview. Moving on, have you ever seen something like this [intervention sheet]?

**Interviewee**: No

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

**Interviewee**: Yeah, it would have helped.

**Interviewer**: How?

**Interviewee**: We would have learned more about the digester from that information.

**Interviewer**: Why would that be important?

**Interviewee**: It would have helped. This information is like you have been given a phone number. If you are given a phone number and you have a problem, you look for the contact and then make a call. In the same manner, if there was a problem, we could have been going to this information and act accordingly.

**Interviewer**: Okay, today is 26 July. How do you describe the state your digester today?

**Interviewee**: Of all the things that I was given I’m only remaining with the pipes. As you can see, we have children running around so they misplaced everything. Thus, most of the things were damaged or lost because of them. Everything is lost except for the pipes and its inside. Also, we do have the bag, it`s there on the roof structure. [Interrupted by another woman]

**Interviewer**: Yeah, you are telling me it’s dead; all the things are lost except for the pipes and the digester bag, which is now a roof sheet.

**Interviewee**: Yeah. It’s dead. We only have the pipes and digester bag.

**Interviewer**: Okay, why do you think it failed?

**Interviewee**: It’s because of how it worked after it was commissioned. I reported to [name redacted] how it was working, but nothing happened. So, it was more like throwing away a piece of cloth on the ground and leaving it there. What happens? You find it eaten and damaged by the termites.

**Interviewer**: So you are saying it reached this state because it never really got off well and the installers did not follow-up?

**Interviewee**: Yep, it is because of the installers. They left us in the middle of the journey; they did not come to service it when it malfunctioned. But, let me not pull them down, I might be wrong.

**Interviewer**: Oh, (laughs) why? You think you would not be fair to them?

**Interviewee**: They gave us the digester, which is kindness on its own and then told us to feed it, so maybe we did not feed it right.

**Interviewer**: Why do you say that? And, how were you feeding it again?

**Interviewee**: Because it is the only reason, I can think of as a reason that made it fail. As far as feeding it, I was feeding it with 6 buckets of manure and 5 buckets of water every three or four days.

**Interviewer**: We are remaining with 5 questions or so. How much did the reactor cost?

**Interviewee**: Mmh, I cannot know. I can only remember that a lot of people we are coming in big cars – and we simply accepted it and did not follow the other things.

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

**Interviewee**: No. Nothing!

**Interviewer**: You told me bricks.

**Interviewee**: Oh, yeah, bricks, and the people I paid to build the wall around it.

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

**Interviewee**: That is all.

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

**Interviewee**: It was my two boys and me.

**Interviewer**: How many did masonry work?

**Interviewee**: It was two, and it took them two days.

**Interviewer**: Did it help you to save money?

**Interviewee**: Yeah

**Interviewer**: Approximately, how much do you feel you saved?

**Interviewee**: I saved maybe K3000… I sell traditional whisky, so that’s my source of income. So, the money I saved came from that business (laughs).

**Interviewer**: Why didn’t you use the digester for Kachasu (African traditional whisky) brewing?

**Interviewee**: No, That was for cooking nsima and side dish. And, that’s where we could have benefited more. That’s for cooking nsima and not Kachasu.

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

**Interviewee**: Aah no, my brother, Kachasu is not easy to cook; Kachasu needs a lot of energy to boil.

**Interviewer**: Maybe you are underestimating the digester. It produces strong flames.

**Interviewee**: But, not to the point of cooking hard meals, and certainly not Kachasu. Kachasu requires a lot of fire. We use two bundles of firewood to make Kachasu. So, if you tell me that the digester can boil water for bathing, I would agree, but not Kachasu.

**Interviewer**: (Laughs) what was the biggest difference in your life when it was working?

**Interviewee**: The biggest change was that I was cooking without bothering about igniting fire. I was cooking like I was in town or somewhere, and I loved it. So, that was the biggest difference.

**Interviewer**: You wish to live in town?

**Interviewee**: (Laughs) who doesn’t want to live in town. Is there a person who doesn’t want good things (laughs)? That time it was like the town came to our village. Nankumba was like a town to us that time, for sure.

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

**Interviewee**: Biogas is good and it is my prayer that one day I will have it again. Moreover, I would like to be trained properly afterwards, so that I could manage it properly – that’s all I want. I still think about it, and I wonder how we missed that opportunity, and how it didn’t work. Nevertheless, throughout this time, [name redacted] has always been encouraging me; he comes repeatedly, and he is always telling me not to lose hope because the installer one day would come.

## **Interviewer**: What is the future of biogas in Malawi? Is the future bright or dim? Where do you see it five years?

**Interviewee**: Yeah, it has a bright future. I didn’t know about it, but some people gave me. We have people who want others to have it, so it will spread in the end.

**Interviewer**: You were given one, and someone in this village was given one. But, not even one is working today. Do you think it’s manageable?

**Interviewee**: It would be improper for me to say it can't work because I didn’t stay with it for long. So, I don’t really know it well, and I also don’t know what went wrong. Maybe, I did something wrong on it; maybe they didn’t install it properly. So, I can’t say it`s unmanageable.

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

**Interviewee**: I would chose the same if I had cows. But now I don’t have cow I can’t manage it. Maybe I can be sourcing it from other people, but like I have said everything is about money these day. Imagine if people would sell broken bricks, what more manure. So, if there can be a technology that can be used without using money regularly I would go for that.

**Interviewer**: Okay, do you have any last words?

**Interviewee**: Biogas is a good thing to have. And I’m a very lucky person to have been given one. I never expected it come to me. In this village, we are too many, and to be a beneficiary is luck. The world is changing; the world is not like it was some years back, so we need this kind of thing to replace traditional methods of cooking. – Yeah, I was excited that I got a Biogas.

**Interviewer**: Thanks for the interview.

**Interviewee**: Welcome and thanks for coming