**BIOGAS ASSESSMENT PROJECT**

**Site ID: 57**

**Date: November 16, 2022**

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

**Interviewee**: It came here with Ecogen, and when they came at SHMPA, they taught us about its requirements and management. In addition, after the meeting we had with them we learned that it supplies fertilizer as well as energy for cooking thereby saving the environment, as it does not involve firewood. So, after the meeting session, I became interested in biogas, and I also thought I could manage it.

**Interviewer**: Where did you get the funds to get a biogas?

**Interviewee**: I used to my own money. I bought the digester at K650000, but they gave me an open installment payment period of 2 year. So it’s not like we pay every month or after every 3 or 6 months, we just agreed that it 2 years we should settle the payment.

**Interviewer**: Oh, that’s good.

**Interviewee**: Yeah, it’s really good. Right now, I’m able to get fertilizer from it and also I’m able to cook my things easily.

**Interviewer**: Who built it?

**Interviewee**: It was build by Ecogen. I remember it was [name redacted] and his team that came, and my people supported them too. For example, the holes were dug by my people. In terms of the equipment and everything, for example, the buckets came from Ecogen.

**Interviewer**: How many people came from the installation company? And, how many people were from your side?

**Interviewee**: My people were 2, and they also came 2. But, if we include their driver I can say 3.

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

**Interviewee**: It didn’t take long to build. My people took two days to dig the hole, and the installers also took some hours to assemble everything. So, if we include the time it took to make feedstock, I can say it took 3 days to do everything.

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

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

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

**Interviewee**: I have 6 cows.

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

**Interviewee**: I didn’t know anything about biogas before Ecogen came. I was enlightened about biogas at the meeting session we had with them.

**Interviewer**: What was the meeting session like?

**Interviewee**: Ecogen came for a one-day meeting session and 60 cow farmers attended the meeting. So, at first they briefed us about Ecogen and biogas. Then, they asked us what are our sources of energy, how much firewood or charcoal do we use in a month, and they also asked us how much fertilizer we use on our crops. Then, they went on to say that with biogas we could stop usingfirewood and eventually save money and the environment. Then, they said that with biogas we would also stop buying inorganic fertilizer. So, when I heard all this I became very interested and that’s why I got one.

**Interviewer**: You have said that they asked you to provide information regarding money you spend on charcoal and firewood. I believe they asked that to know how much you were spending as an individual or collective on firewood and charcoal. How much were you spending in a month? Or, how much was the group spending in a month after their computation?

**Interviewee**: It was a lot of money – it was a lot. I have just forgotten where I wrote the figure. Nevertheless, you can imagine how much firewood and charcoal we use in a day, and equate that to a month or year, and then express that in monetary terms– so, it was a lot of money.

**Interviewer**: How much fertilizer do you use per growing season?

**Interviewee**: I use four bags of fertilizer, and you can see now that a bag of fertilizer is K59000, so that is a lot of money too. So you can see that biogas is good. I remember last time I tried it on a small piece of land, and it worked. So this time around, I am going to use a lot of it… I got the digester last year October, so I had time to try it on vegetables, tomatoes, and it worked quite okay.

**Interviewer**: This meeting session you had with Ecogen, who attended it? Was it for cow farmers only or some community members were there as well?

**Interviewee**: It was just for 60 cow farmers.

**Interviewer**: So at the end of the program, how many were willing to get the digesters?

**Interviewee**: 15 cow farmers showed interest, but at the end, only three of us got the digesters.

**Interviewer**: Why do you think the other people did not get it?

**Interviewee**: It is not as if the other people did not like it, no. They liked it but people thought the money was too much, so they just thought they could not afford it. People thought K650000 was way out of their budget. Nevertheless, now some people are interested to get the digesters after seeing how good we are doing. I remember in a phone call with the installers, they told me that many people from our group are showing interest in the digesters, so they are thinking of coming again.

**Interviewer**: Oh nice. From my understanding, I believe you expected to use the digester for cooking and as a source of fertilizer too. Apart from this, what else did you expect?

**Interviewee**: When they came, we asked them if we could use the digesters for lighting. So, they responded that at that time it was not possible, but in the future.So at the moment we are only using the digesters for cooking and as a source of fertilizer.

**Interviewer**: Why did they say it was not possible to have lighting at that time?

**Interviewee**: They said that they needed some equipment to put together to make it produce light. Nevertheless, I have to say I did not fully grasp what they were saying. I think they also said it takes time for the digester to produce enough gas to use for cooking as well as lighting at the same time.

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

**Interviewee**: No, after the discussions we had at the meeting with Ecogen, we didn’t have any training afterwards.

**Interviewer**: At the meeting with Ecogen, you have said they briefed you about biogas. What else did you learn at the meeting?

**Interviewee**: Of course, they briefed us about biogas. After that, they demonstrated to us how it works. I recall they made a cooking demonstration. They did cook nsima, side dish, and we ate the food.

**Interviewer**: Did they use a storage bag?

**Interviewee**: They brought a gas storage bag, they taught us about biogas, and then we cooked nsima and side dish on a two burner stove.

**Interviewer**: Oh, that’s nice!

**Interviewee**: Yeah, it was nice. And, we were very interested in the whole thing, and we could not believe how fast it was, and that we cooked two things at the same time.

**Interviewer**: How prepared to run or operate the reactor did you feel you were after that meeting and other meetings that followed?

**Interviewee**: Yeah, after that, another man called [name redacted] came and he told us what to do when there was little gas. He told us to step on or press the digester, so that we could have strong fire. Then, he told us how to use it, and he finished by saying that if we have any problem we should be calling them to fix it.

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

**Interviewee**: I was using firewood and sometimes I was using charcoal.

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

**Interviewee**: That time we were just cutting or pruning the trees. And, when we had nothing to prune, we used to buy firewood. So, that’s how it was that time.

**Interviewer**: Do you have the trees, or do you gather firewood in the forests?

**Interviewee**: We have bluegum trees around as you can see. We also have mango trees. So, we use those for firewood too.

**Interviewer**: And some times you used charcoal?

**Interviewee**: Yeah.

**Interviewer**: How many bags of charcoal did you use?

**Interviewee**: Maybe 1 and 1.5 bags a month.

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

**Interviewee**: It was K8000 or K9000.

**Interviewer**: You are saying you had six cows. How did you manage your feedstock before the intervention?

**Interviewee**: I was simply taking the manure out of the cow house, and then gather it in a pit before taking it to the fields.

**Interviewer**: Some people say animal manure does not work as fertilizer, what is your take?

**Interviewee**: That’s a lie. You cannot compare maize applied with animal manure as fertilizer with maize that was not applied anything. It differs.

**Interviewer**: How do you make your manure to be effective?

**Interviewee**: I just sometime put it in a pit and wait for some time to process. Sometimes, I simply heap it and then wait for some time for it to process and afterwards take it to the field.

**Interviewer**: Do you add ash?

**Interviewee**: I shouldn’t lie, I don’t put anything else. I just use the manure as it is.

**Interviewer**: How much feedstock did you use to start it up?

**Interviewee**: We started it with three drums of cow manure.

**Interviewer**: How big are your drums?

**Interviewee**: The popular ones – I think they are 200 liters.

**Interviewer**: Yeah, you are right. I think its 200 liters. How much water did you use?

**Interviewee**: Oh, it was a lot of water. I believe we used 8 drums (200 liters) of water.

**Interviewer**: Did you get all the three drums (200 liters) of cow manure from your cow house?

**Interviewee**: Yeah, it was all from my cow house.

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

**Interviewee**: We got the water from a river because it is close by.

**Interviewer**: How close is the river?

**Interviewee**: I think it is 100 meters. It’s not far (laughs)

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

**Interviewee**: We fed the bag for two straight days. On the second day the bag started inflating, and on the third day we started it.

**Interviewer**: How much gas did it produce after commissioning?

**Interviewee**: On the first day, we lighted up the two burners and we were able to cook nsima and side dish (1 hour – 1 hour 30 minutes). We cooked everything quite okay that we even turned off the burners after cooking everything – it did not go off on its own, but we turned it off.

**Interviewer**: On the second day?

**Interviewee**: It worked quite okay too – and that is when we felt that our lives were about to changed. And, in the morning, in the afternoon we were able to cook without issues…. It only needs feeding!

**Interviewer**: Do you use it in the morning, in the afternoon and in the evening?

**Interviewee**: Yeah, we do. As long as we feed the digester, it works quite okay.

**Interviewer**: Are there times you fail to feed it?

**Interviewee**: If we do not feed the digester, it produces little gas; the gas is weaker compared to when the digester is fed.

**Interviewer**: So what do you do when it is producing little gas?

**Interviewee**: We don’t entertain ourselves to reach that level. So, we try to feed it daily with 3 or 2 buckets of cow manure day, and to this we add 2 buckets of water too.

**Interviewer**: You have mentioned that sometimes it produces less fire than usual, especially if not fed. I can imagine that it happened at least once. So, under what circumstances do or did you fail to feed it?

**Interviewee**: You know what happens in life, you cannot be there all the times. Sometimes we find ourselves away from home. But, even if we don’t feed it for a day, it doesn’t reach a level where it fails to produce enough fire for us to cook whatever we need. Therefore, it works that we even cook, but the period of not feeding needs not to go beyond a day or more.

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

**Interviewee**: It just needs feeding with cow manure and water daily. And, the cow manure needs not to contain rubbish, and the water too needs not to contain soap. So, we make sure we have cow manure without trash in a bucket then add water, and then mix the feedstock thoroughly. Afterwards, we put the feedstock in the digester bag. So after feeding the digester, it starts producing gas and it also releases digestate at the outlet.

**Interviewer**: What kind of feedstock do you feed it?

**Interviewee**: I only feed it with cow manure.

**Interviewer**: How do you prepare the feedstock? Do you have a mixer or do you use hands?

**Interviewee**: To be honest, I mix the feedstock with hands – I do not use anything else but hands.

**Interviewer**: Whilst wearing gloves?

**Interviewee**: Ah, no. I just use bare hands.

**Interviewer**: Don’t you think you put yourself at risk?

**Interviewee**: (laughs) Ah no, after feeding it, we wash our hands thoroughly.

**Interviewer**: Do you feel gross about handling dung?

**Interviewee**: No, it’s just cow dung. Moreover, we handle it all the times when making manure as fertilizer as well.

**Interviewer**: So you are saying you feed it with two buckets of cow manure and then add two buckets of water, right?

**Interviewee**: Yeah, I usually feed it with two buckets of cow manure and two buckets of water everyday. Rarely do I feed it with 3 buckets or 1 bucket of cow manure - and, I do see a difference after feeding it with a single bucket of each of the feedstock. When I feed it with one bucket of cow manure and one bucket of water, it produces a relatively small amount of gas.

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

**Interviewee**: I feed it, and I have a son who feeds it when I am not around too.

**Interviewer**: How do you feel about the job? Or how does he feel about the job?

**Interviewee**: He is okay with it, and he even feeds it without me telling him.

**Interviewer**: Oh, he is a hard worker.

**Interviewee**: Of course, he is a hard worker!

**Interviewer**: What were operation requirements?

**Interviewee**: They just told us that if we see any problem we should call them. So, in my case the handle on the gas valve which is located close to the stove broke as I was opening it. Then, I called Mphatso to report the issue, and then he sent Hope who came and fixed it.

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

**Interviewee**: It took me 3 days to report that the gas valve handle was broke, and the next day Hope came to fix it.

**Interviewer**: Oh, that was fast.

**Interviewee**: Yeah, they were so fast to come and fix it.

**Interviewer**: Does it meet you needs?

**Interviewee**: Yes, it meets my cooking needs. However, sometimes the intensity of the fire declines as we are cooking. But, I see a great change in my life, and there is a huge difference with the way things were before the digester.

**Interviewer**: What do you mean when you say the intensity of the fire declines? Can you elaborate on that?

**Interviewee**: I mean, when we cook for a long time the intensity of the fire declines; it is just more like the intensity of the fire is not just constant over time. So, that’s a thing I note most of the times

**Interviewer**: How long does it take the fire to start losing intensity?

**Interviewee**: If we cook for more than one hour and 30 minutes, the intensity of the fire starts to drop.

**Interviewer**: How long does it take the fire to go off completely?

**Interviewee**: That has never happened. It has never stopped whilst I’m cooking. It’s just that the intensity drops after one hour 30 minutes, but it doesn’t stop completely.

**Interviewer**: What challenges have you faced?

**Interviewee**: The one challenge I had is what I have already mentioned – and that is the challenge I had with the gas valve. But it wasn’t a big problem because we were given a one year guarantee. So, any problem that happens in the first year Ecogen is responsible for its maintenance. Thus, when the gas valve broke I didn’t spend any money. I just made the call.

**Interviewer**: Some people say it does not work well or even not work at all when there is no sunlight, what is your take?

**Interviewee**: Ah, no. If we feed it, even when there is no sun we cook without issues. I can’t say we don't cook because of clouds, no! So I think the problem is that they don’t feed it around that time – because if we feed that time we don’t see any problem.

**Interviewer**: So, that’s not a problem?

**Interviewee**: Yeah, that’s not a problem. Nevertheless, the other problem was that when we started using it people were saying the nsima did not taste good, and the texture was not good too. They said the food was bland and insipid. They were saying the nsima tasted like the nsima cooked at low temperature.

**Interviewer**: Can we say it has improved now? Or, maybe you are now used to eating insipid food? (Laughs)

**Interviewee**: (laughs) personally, I didn’t have a problem with it – I’m not a picky eater.

**Interviewer**: Okay, how long did it take the gas valve handle to malfunction?

**Interviewee**: The digester was commissioned in October, and the gas valve broke in April.

**Interviewer**: When was it built again?

**Interviewee**: It was built in 2021, October.

**Interviewer**: Have you seen something like this?

**Interviewee**: No, and the problem that happened at the gas valve I wasn’t told. It was an odd problem for me. But, they told me that the system blocks sometimes because of water. So, they taught us how to open and remove water at the water trap. They also told us that sometimes the flow of gas is restricted in the pipe, so they told us to check and replace a filter, which looks like a wire mesh scourer in the system. They told us that when we see the black like things in the yellow pipe, then we should replace the filter.

**Interviewer**: Have you ever faced this problem since they installed it?

**Interviewee**: No, it has never occurred. The only replacement we have done thus far is of the gas valve.

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

**Interviewee**: My digester is in perfect condition. I am able to cook everything quite okay – I do not see any problem; whenever we want to use biogas, it does not run out of gas; when it is off it is because we have switched it off on purpose.

**Interviewer**: From October of last year day to this point it’s a long time, how have you managed to keep it working? What do you do?

**Interviewee**: I just use it as I was advised by the installers like I said. I feed it as I was taught. Because one thing about digester is that they need daily feeding to produce fire, and I do just that.

**Interviewer**: Right now, do you use biogas strictly? Or, you also use other methods?

**Interviewee**: To be honest with you I like cooking on biogas. I don’t like using firewood. Some other times though my children do use firewood to warm water for bathing. But, we use biogas most of the times.

**Interviewer**: Why do your children sometimes use firewood when they have biogas? Is it that they do not like biogas?

**Interviewee**: They just feel like it is not right to use a big heavily sooted pot on the biogas stove (laughs heavily). It’s just their preference.

**Interviewer**: Do you still use cow manure as fertilizer on your farms?

**Interviewee**: Yeah, we still use it as fertilizer. We get a lot of cow manure from the cows such that its supply exceeds the demand of the digester.

**Interviewer**: How to you use the fertilizer?

**Interviewee**: Just like in the past [put it a pit, and then take it to the farm]. As for the effluent, we get from the digester we do not use it raw. We dilute it with water before using it as fertilizer because it is too strong.

**Interviewer**: How to dilute it?

**Interviewee**: They advised us to dilute 5 liters of effluent with 20 liter of water.

**Interviewer**: Does it work?

**Interviewee**: Yeah, it works. But, the last time I tried it I was skeptical about it so I diluted 10 liters of effluent with 20 liters of water because I just felt like diluting 5 liters with 20 literswas not right. I felt like the fertilizer would be weak and not work. Nevertheless, after using it worked okay.

**Interviewer**: So this year, are you not buying in organic fertilizer, you will use the effluent?

**Interviewee**: Yeah, this year I will use fertilizer from the digester. Once the rains start, I’ll plant my crops and I’ll use the effluent from the digester (laughs).

**Interviewer**: I hope I will not hear from you complaining about it; that all the maize has wilted.

**Interviewee**: No (laughs). I will grow maize on one side with the effluent so that other people will learn about the bio-fertilizer from me.

**Interviewer**: Why are you not going to use only the effluent on your crops?

**Interviewee**: No, I have to divide the fields.

**Interviewer**: Why?

**Interviewee**: I should divide based on the fertilizer.

**Interviewer**: What do you mean?

**Interviewee**: I haven’t harvested the effluent, it’s still there. And, I don’t know how much I will collect from the digester, and also I don’t have enough buckets, so I don’t think I will collect enough.

**Interviewer**: How much effluent of you collected so far?

**Interviewee**: The bucket I use for collection effluent is almost full more – it has enough fertilizer.

**Interviewer**: Did you line the hole for the digester bag or effluent collection?

**Interviewee**: No, I didn’t. The digester bag was simply placed in the hole.

**Interviewer**: Did they tell you about lining it?

**Interviewee**: No, they didn’t explain that to me. They just advised us to dig a hole which the digester bag would fit into perfect.

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

**Interviewee**: The hole was 100 meter deep [100 cm] and the other dimensions I have forgotten.

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

**Interviewee**: When we got the materials we didn't ask... But, I do think they explained that it’s imported. You know it’s difficult to remember things when you are old.

**Interviewer**: We are remaining with 3 questions. What has been the biggest change in your life since you’ve got the digester?

**Interviewee**: Now, I cook with ease. My eyes don’t get watery when I’m cooking – Now, I cook things fast. Also, I’m able to make fertilizer from the digester.

**Interviewer**: Do you think it’s helping you to save money?

**Interviewee**: Yes, I am saving a lot of money. The money I was spending on charcoal and firewood I’m using it to buy other household necessities. Moreover, with the way the price of fertilizer has gone up, I am expecting to save a lot more.

**Interviewer**: We are the remaining with two questions. What is your opinion of biogas?

**Interviewee**: My only wish now is that I should use the digester for lighting; on top of cooking, I would also like to use it for lighting. So, I think biogas can be better if lighting can also be included in its system. That said biogas has changed my life especially because I am able to cook things fast.

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

**Interviewee**: The other drawback is that it produces strong odor after closing the stove while the gas valve outside is open. Therefore, you need to close the gas valve outside first before turning off the stove to avoid the smell. So, that is a major drawback, and it mostly happens when children are using it, as they tend to forget to close the gas valves.

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

**Interviewee**: Excerpt biogas what else can I wish for – I cannot say I would wish to cook on electric cookers because this is a remote area and has no electricity lines. However, if the government can bring electricity, I would go for electric cookers. It`s far much better than cooking on firewood.

**Interviewer**: Why do you hate cooking on firewood? What’s wrong with that?

**Interviewee**: Of course, we cook on firewood but it is not easy to find wood. And, it’s very tough for us women to stand eye redness and tearing that happens because of the smoke when cooking on firewood especially if it`s wet wood - it’s not good at all! It very bad (laughs)

**Interviewer**: That was my last question. Before closing do you have anything else to say?

**Interviewee**: Thanks for coming to interview me. My plea is that those that do not use biogas should consider using it because it makes cooking easy and fast. And, I’m thankful to Ecogen for bringing the biogas here. I do receive a lot of visitors coming to see and admire the digester, and most people are becoming interested in biogas. So, it’s a joyful thing to have. So, I’m just happy to have it, and it’s good that the payment scheme is fair – so everything is good!

**Interviewer**: You have said you are supposed to pay the money in 2 years. A year has gone now, have you paid have of it? (laughs)

**Interviewee**: I have not paid more than half. But, I am sure in 2023, I will finish paying the debt.

**Interviewer**: Oh, nice. I hope I will not hear that they came to taken off because you failed to pay the debt.

**Interviewee**: (Laughs) I’ll finish. And I’ll do anything to finish the debt.

**Interviewer**: Great. Thanks for the interview.

**Interviewer**: Thanks for coming too.

**Interviewer**: Welcome.