**BIOGAS ASSESSMENT PROJECT**

**Site ID: 36**

**Date: September 23, 2022**

**Interviewer:** First question, where did this digester originate from?

**Interviewee**: I have forgotten. It’s been a very long time.

**Interviewer**: Yes indeed, 2017 is far.

**Interviewee**: Yeah, I have forgotten.

**Interviewer**: How many people from the installation company came?

**Interviewee**: It was mostly two people. They were parking their car there, and would go to the place where the digester was installed, and then tell us one or two things.

**Interviewer**: So, it was two people?

**Interviewee**: It was a mostly two people; sometimes, they would come three people.

**Interviewer**: Do you remember what they told you, or what they were telling you?

**Interviewee**: I remember they told us to dig a hole, and then they gave us the dimensions for the hole. They also told us how to make feedstock to start up the digester. After feeding the digester, the bag got full. Then, after some days, they came and I recall they asked us to switch on the stove after they showed us how to. Afterwards, they took pictures, videos, and left.

**Interviewer**: This was 2017, right?

**Interviewee**: Yeah, that was 2017. But, after sometime, some people came and they asked us questions regarding its functionality. We told them that biogas is good, but our digester was going off whenever the sun disappeared. Sometimes, it was happening whilst cooking, so we had to start fire again on firewood. Then, they said they were going to come with solar panels to supplement biogas. Then, they got in their cars and picked papers for us to sign. So, we signed and since then they have never come back.

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

**Interviewee**: It took about a month for everything to be done, from the first came to the day we started it. The first week, we dug the hole. After that, we sourced fresh cow manure and made the feedstock. I have to tell you, mister, it was a heavywork (laughs) - to feed the bag with manure was not easy at all.

**Interviewer**: Oh, I can imagine. Let’s start with digging. How many people from your side took part in the building process?

**Interviewee**: It was two people, my husband and one hired worker.

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

**Interviewee**: He charged us K3000.

**Interviewer**: Who collected water?

**Interviewee**: I did that myself with the help of my three kids.

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

**Interviewee**: We got it from the cow house of our chief; when we went there, he showed us fresh manure in the cow house, and we got it.

**Interviewer**: Oh, he didn’t say no?

**Interviewee**: No, they knew that we wanted to use the manure for biogas, so there wasn’t any problem. So, when we got it we made feedstock for the digester.

**Interviewer**: How much manure did you get?

**Interviewee**: We got 6 or 10 bags of cow manure, if I have forgotten. To this, we added 12 buckets (20 liters) of water separately from the ones we added to the cow manure for mixing.

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

**Interviewee**: Biogas needs hard working people, so the chiefs and community development committee saw that we are hard workers, and chose us - I just think so. A person who is not hard working or committed cannot manage it. It’s involving. It’s not easy to handle fresh manure daily. So, I accepted it, because the project was to develop the community. I liked it also because it presented us an opportunity of cooking without firewood. We simply switched it on whenever we wanted to cook. It was very easy and fast to use. And, many people were coming to appreciate the digester .So we were simply telling them to come at lunch when the sun was brightest, and make a cooking exhibition. It was good and the people liked it.

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

**Interviewee**: Not at all. We learned about this when the senior chief communicated to the people that an organization was coming to install digesters to certain individuals, and that we were beneficiaries. So, we accepted it.

**Interviewer:** What procedures or steps did the chief take to select the beneficiaries?

**Interviewee**: The chiefs called us for a community meeting and briefed as about the project. The communication at the meeting was that running a digester is very involving, so hard working and committed people would be chosen. So, people were choosing amongst themselves who they thought would manage it. Then, they would ask the chosen person, if he or she was willing to accept.

**Interviewer**: How did people react? Didn`t people feel jealousy and bitter after not being selected?

**Interviewee**: No, it was fine.

**Interviewer**: Okay. You had the right to accept it, why did you accept to build it here?

**Interviewee**: The people here did not know about it, so they explained that it is used for cooking, and you don’t need firewood when you have it. They also explained that it helps people to save money especially those that buy charcoal. Then, they told us that we would learn more from the project implementers when they came.

**Interviewer**: What were your expectations?

**Interviewee**: I expected it to last longer. I thought I could be using it today. And, if it had worked longer, many people would have adopted it here. We liked it because it was fast cook on, and it prevented people from searching for firewood. So, it gave us rest and peace, and we liked it a lot. It was good. And, again, I’m sure, if the project implementers worked with us to the point where we could run it on our own, many people would have adopted and valued it.

**Interviewer**: You mentioned that at the community meeting you were told by the community leaders that you would learn more from the project implementers. What did they tell you? What did they tell you to expect from this?

**Interviewee**: They told us a lot. First, they told us that we would use it for cooking. They also went on to say that, it’s like electricity so we would use it as a source of energy for our TVs. and charging phone batteries. It was a lot.

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

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

**Interviewer**: If you didn’t receive training, then how were you able to switch it on and off?

**Interviewee**: It wasn’t training, but when they came, they just told us instructions. For example, they showed us a button for switching it on and off. They also told us how to make feedstock. So if there was training, maybe I have forgotten it.

**Interviewer**: No, you haven’t forgotten. That was it. How did you meet your energy needs before the intervention?

**Interviewee**: I use firewood.

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

**Interviewee**: We get it from a very far place.

**Interviewer:** How far? I mean, if you leave at 6:00 in the morning, what time do you return?

**Interviewee:** We return around this time.

**Interviewer**: Around 2 PM?

**Interviewee**: Yeah, it’s very far. We pass the houses you see there, and get to the mountains. That’s far.

**Interviewer**: How often do go there?

**Interviewee**: Maybe in a week we go there once because it’s far. And, when go there our legs hurt. We don’t go there sick or when we don`t have the strength, because going there you are okay could be disastrous. So, when we are not ready for it, we just look for small pieces of wood around. But, we are forced to go there, when we need good firewood.

**Interviewer**: Are there forest officials there?

**Interviewee**: Yeah, but it’s not as if we go into the mountain to cut trees. We just go there to pick dry wood or we get firewood around the mountain.

**Interviewer**: Do you use charcoal?

**Interviewee**: To use charcoal it means you have money. We are poor, so we don’t use charcoal.

**Interviewer**: Do you differentiate cooking on biogas from using firewood?

**Interviewee**: In terms of taste, there is no difference. But, when you cook on the firewood, we sweat a lot because of the flames. While when we cooked on biogas, we didn’t sweat because flames are concentrated on the pot. Another thing is that, biogas doesn’t produce smoke; it’s clean. So, after cooking on biogas a person doesn’t smell or the clothes don’t smell smoke-like.

**Interviewer**: Were you using cow manure from your cows or you were getting manure from other people for feeding it?

**Interviewee**: We had our cows, but it wasn’t enough. So, we were getting cow manure from other people too.

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

**Interviewee**: I had five cows.

**Interviewer**: Do you still have them? I haven’t seen any.

**Interviewee**: Yeah, they have gone out for grazing.

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

**Interviewee**: We were just waiting for the manure to dry, and then take it to the farm.

**Interviewer**: Okay, some people have told me that they don’t use manure

**Interviewee**: Maybe, on that side of Tengani, but here we apply manure as fertilizer. Even agriculture workers advise us to use it. They also educate us how to make fertilizer from manure. We make fertilizer in two ways. First, we bury it a pit and cover it. Or, we just pile the manure and turn it regularly for some time, and then take it to the farm. It’s only people who are lazy that don’t use manure. Of course, the soil is good, but it still needs additional fertilizer.

**Interviewer**: You said that to start it you used six bags of cow manure and more than 12 buckets. How long did it take to start up after feeding it?

**Interviewee**: It didn’t take long to start up. After feeding the bag, it got full, and they told us that it was enough to start it up. Then, they assembled the pipes and stoves, and told us to switch on and it worked.

**Interviewer**: How long did it take to produce fire from the period you fed it with the initial feedstock?

**Interviewee**: The whole thing took a month from feeding it to starting up. And throughout this time, we were communicating and updating them as we had their numbers, and when we finished we called them and they came.

**Interviewer**: So, that’s like you waited for 2 weeks or so, since it took you a week or so to dig and make the initial feedstock. How did you use gas?

**Interviewee**: I used it for cooking one.

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

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

**Interviewer**: How far is it?

**Interviewee**: It’s far.

**Interviewer**: Like how far?

**Interviewee**: One is close to the chief’s house. That’s the closest.

**Interviewee**: That’s like 500 - 700 meters. How many people stay here?

**Interviewee**: 6 people.

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

**Interviewee**: The digester only needed feedstock of cow manure and water.

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

**Interviewee**: First in the morning, we used to go and collect fresh cow manure from the cow house. Then, we placed manure in a bucket and filled it up with water, and then mix until the slurry was smooth. After that, we used to pour it in the digester.

**Interviewer**: Nice, how did you mix it?

**Interviewee**: We used bare hands to collect, crush manure lumps and mix the feedstock. Then, we would use a stick to mix it further. But, most of the time we used hands because you can’t collect fresh manure without hands, so we proceeded with hands as well.

**Interviewer**: Did you feel disgusted or unhealthy?

**Interviewee**: Not at all. We were simply collecting manure; add water, and then mix, done! Take another set, put it in a bucket and add water, and then mix. Done! So on and so on. (In the background) [A six to ten years girl said she helped in feeding]

**Interviewer**: I heard this one saying she helped preparing feedstock. Were the kids doing that too?

**Interviewee**: Yeah! They know how to make feedstock.

**Interviewer**: Oh, they wanted it bad. How often did you feed it and in what quantity?

**Interviewee**: If we wanted to boost it up we used to feed it with 2 buckets of cow manure and water. We used to skip a day to feed it again.

**Interviewer**: So the 2 buckets was ready prepared feedstock, not just cow manure?

**Interviewee**: Yeah, that was after mixing cow manure with water. We used to see the thickness of slurry before stopping adding water to the manure.

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

**Interviewee**: We didn’t make it too watery; it was a little bit thick.

**Interviewer**: Did they give you the ratio of the feedstock?

**Interviewee**: No, we were simply looking at the thickness of the feedstock. And, after the thickness was good, we fed it in the digester.

**Interviewer**: Some people soak the manure the day before feeding the digester. Were you doing that?

**Interviewee**: I can only imagine a person using dry manure to do that. As for us, we used fresh cow manure throughout, so there was no need to soak it.

**Interviewer**: So you never fed it with dry manure or do any pre-treatment?

**Interviewee**: They told us to use fresh manure all the times, so everything was done on the spot and no pre-treatment was required.

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

**Interviewee**: It was a tough job especially the day we made feedstock to start it up. On the other days, I collected manure together with the children and my husband was preparing the feedstock itself, so it was not that tough. After, we fed it, the digester bag was getting full and it worked fine. But, I have to say the first day of feeding to start it was very hectic.

**Interviewer**: Your digester had 2 big white pipes, one an inlet and the other an outlet. How was the outlet like?

**Interviewee**: Yeah, it had 2 pipe white pipes. And, I think the outlet was more elevated than inlet.

**Interviewer**: I mean, did you dig a hole at the outlet? And, did you get digestate at the outlet?

**Interviewee**: Yeah, it was making a huge boiling-like sound most of the times it was releasing the digestate.

**Interviewer**: Did you put a bucket at the outlet? Or, you simply dug a hole for collection of the digestate?

**Interviewee**: At the outlet pipe, we dug a hole to collect digestate. So, when we fed the digester, the digestate was failing into the hole.

**Interviewer**: Okay, what were you doing with the digestate?

**Interviewee**: They told us that it could be used as fertilizer for crops and vegetables. But, we made a very big hole, so the hole didn’t fill up to collect and use it.

**Interviewer**: Did you line the hole?

**Interviewee**: No, it was just a hole.

**Interviewer**: Wasn’t it bringing mosquitoes?

**Interviewee**: No, we didn’t see any mosquitoes in the house. Maybe, it didn’t come because the hole was deep, and the digestate was not on the surface or close to the surface.

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

**Interviewee**: They gave us their numbers and told us to call them whenever there was a problem, so they could come to troubleshoot and solve the problem.

**Interviewer**: Like what problem?

**Interviewee**: Any kind of problem. For example, if it wasn’t producing gas or when there was a gas leak. So, we were supposed to call them whenever there was a problem of any kind.

**Interviewer**: Did it ever develop a problem that you called them?

**Interviewee**: No. We never called them.

**Interviewer**: Okay, did it meet your needs?

**Interviewee**: No! Like I said, when we fed it, we couldn’t use it in the morning. We had to wait up to 10 or 11 AM, when the sun was out to use it. Even then, when we did put a pot on the stove, it was going off once the sun disappeared. Then, we could start looking for firewood to start up fire and continue cooking. The next day, I would put a pot of beans, and then the sun goes and I had to start firewood to continue cook. Then, I was fed up, I was like what type of cooking is this, and then I abandoned it. I stopped feeding it, and it stopped working as well. That’s how it was!

**Interviewer**: How long did it take you to say this is enough?

**Interviewee**: It took me a month. So, when I saw no improvements, I abandoned it. I was only hoping that the installers would come and fix it. Because, at one point they told me to keep feeding it and not to give up, because they mentioned that the digester would pick up at some point.

**Interviewer**: So after commissioning, they came and you told the problem?

**Interviewee**: Yeah. I told them.

**Interviewer**: What did they say and what was the end of their coming?

**Interviewee**: They told us that it needed solar panels to supplement it, so that when there was no sunlight solar panels would boost it up to produce energy for cooking.

**Interviewer**: So it was like they conceded that the digester could not work on its own?

**Interviewee**: Yeah, it showed that the digester could not produce fire alone especially when there was no sun. Hence, solar panels were required to support it.

**Interviewer**: Were you able to cook nsima without any problem?

**Interviewee**: The digester was producing fire when the sun was out. But, once the sun disappeared, it was taking a very short time to stop producing fire. So, it was a very discouraging. But, we would have loved to cook on it regardless whether there was the sun or not. Also, I was not able to use it during the late hours of the day. So, I was only able to use it during the afternoon. And even then, it would go off while I was cooking every time the sun disappeared. So that was the main problem.

**Interviewer**: Was there a day you were able to cook nsima and side dish?

**Interviewee**: Uumh, I think I managed to cook beans only a single day. But, in most days, it was not working.

**Interviewer**: How and why do you think you were able to cook for that long on that particular day?

**Interviewee**: That day the sun was out. It was a very sunny day. It was very hot.

**Interviewer**: What challenges were there?

**Interviewee**: The main problem was that it was going off whilst we were cooking. So they should put more ideas to ensure that it stops going off whilst people are cooking. If you start cooking on the biogas, you should finish cooking on biogas whatever you are cooking on it.

**Interviewer**: so it is like when you were cooking on it, it was gradually going off, right?

**Interviewee**: Yeah (Yeah, Children agrees too in the background)… When the sun was out it was taking a little bit longer. But, when the sun disappeared, it was not taking long to stop working.

**Interviewer**: Like how much time?

**Interviewee**: I think it was taking 20 minutes when the sun was out. But, when the sun was not out, it was not long time. After a very short time, it was starting to produce a certain sound, and then it would eventually stop.

**Interviewer**: So you only used it for a month, then you abandoned it. And, the time you abandoned the digester, it did not stopped producing fire completely; it was producing very little fire, sometimes not, and sometimes it was going off while you were cooking.

**Interviewee**: Yeah, we were fed up. We couldn’t imagine cooking under those circumstances.

**Interviewer**: Did you call the project implementers?

**Interviewee**: Yes, some days after it was installed, and they came after a week to finalize its documentation. I don’t remember if it was them or some other people who told us that the digester needed solar panels to supplement it.

**Interviewer**: Who are these people? And what was their agenda?

**Interviewee**: I don't know. But, it was not the installers of the digester. They just said they wanted to assess the digester.

**Interviewer**: Have you seen something like this [sheet of intervention]?

**Interviewee**: No

**Interviewer**: It is information regarding technical problems of digesters and their causes and solutions. What do you think of the information, and do you think it would have helped in your case?

**Interviewee**: Yeah, yeah, and we could have used the information. I mean, the digester was working, so it was simple for us to look at the information and do what the information was saying. So, I think it would have helped because it could have assisted us to identify the problem and fix it.

**Interviewer**: Today is 22nd of September 2022. Let us suppose the installers call you and ask about the status of the digester today, what would you say?

**Interviewee**: I would tell them that the digester continued the way you left it, so we stopped feeding it, and abandoned it. (Laughs)

**Interviewer**: (Laughs) oh

**Interviewee**: We abandoned the digester and we did not we use it anymore. You discouraged us by not following up, so the same way you abandoned it, we also abandoned it. Can’t more say? (Laughs)

**Interviewer**: The thing you left us is a clothesline today…

**Interviewee**: (laughs heavily) Aaah

**Interviewer**: Better if you had just given us clotheslines…

**Interviewee**: (laughs heavily) the pipe was just staying in the house, so I decided to us it as a clothesline.

**Interviewer**: Looking back, how did it reach this state? And, when you consider all things, what caused it to reach this state?

**Interviewee**: I think it reach this stage because there was no follow-up. And the other thing is that there was no training. They should have told us “if you see this, do this and that”. So, the implementers should have made us learn it…. Follow up was very important and would have prolonged its lifespan. Because with that we could have been sharing them the problems we were facing, and they would have addressed the issues. So, follow-ups would have help us to communicate our problem and it could have given them an opportunity to tell us how we were faring and that would have motivated us to work hard and use it too. But, after installing it, they never stepped a foot on this compound again.

**Interviewer**: Why do you think it never work from the onset? I mean, yes, of course, training and follow up would have helped to keep it running. But, why did you think it never start off? What went wrong? Do you think the digesters were not durable or did the installer did something wrong?

**Interviewee**: The digester looks durable and of high quality. But, I just don’t know how they installed it. I do not know if digesters were made to work in the presence of the sun only. So, after this we called them and after a week they came and explained that it needs solar panels to supplement it. However, on my side, I did everything to make it work, because I knew that to work it needed feeding as they said. But, I just don’t know what went wrong.

**Interviewer**: How do you meet your energy needs that it is not working? Are you still using firewood only?

**Interviewee**: Yeah

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

**Interviewee**: We get it where we used to get it before.

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

**Interviewee**: I just let it dry in the cow house, or pile it on a heap and then use it as fertilizer.

**Interviewer**: Someone told me that people burn the manure. Do you do that?

**Interviewee**: I do that when it’s excess to repel mosquitoes and ticks, which are a nuisance to the cows.

**Interviewer**: How do you repel the mosquitoes when you do not have excess manure?

**Interviewee**: We simply try to clean the cow house as often as we could, but still it`s not that effective.

**Interviewer**: We are going towards the end of the interview. We have about five questions to finish off. How much did the reactor cost?

**Interviewee**: I have forgotten.

**Interviewer**: But, they did mention the cost?

**Interviewee**: I am not sure. It’s been long, plus we didn’t write it down.

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

**Interviewee**: I contributed cow dung, water and labour; I spent a lot of energy on that!

**Interviewer**: Did the digester save you any money? Oh, you mentioned that you only use firewood, and I imagine that you don’t buy.

**Interviewee**: We usually source firewood ourselves. But, sometimes when we have money, we do buy people do sell firewood here.

**Interviewer**: How much is firewood?

**Interviewee**: Two pieces of firewood cost K150, but was K100. A bundle is K1, 500 or K2, 000.

**Interviewer**: The time it worked, did you save money?

**Interviewee**: I did not save money, because I rarely buy firewood. But, it somewhat reduced the time I was going to look for firewood. I was using only firewood when it was off. So, biogas is good because you do not need firewood. If it worked smoothly, I would not have to search for firewood at all.

**Interviewer**: As a beneficiary and someone who has used biogas before, what is your opinion of biogas?

**Interviewee**: Biogas is good, and you would have like it to continue working. Nevertheless, I do not know the plans of the project implementers. But, if they come again, we need training to understand it and use it for a long time. We want it again to see and feel its goodness and benefits. The last time we did not really feel it`s benefits, so we have some unfinished business with it.

**Interviewer**: Do you think it has a future? Or, to bring it here again is just a waste of time!

**Interviewee**: It should have a future because it is a way to go in regards to saving the environment. I am sure, if the beneficiaries we able to run it for long, many people would have adopted it because people did show interest to own the digesters. People now ask what happened, and we tell them it didn`t work for long. And, when they see that the people who were considered exemplary failed, they do not want it because they feel its unmanageable (laughs). They cannot even dare to get a biogas.

**Interviewer**: You cannot. That is like you are starting a war. You are getting yourself in trouble. Last question, If you could have designed your own energy or waste intervention what could you have chosen instead?

**Interviewee**: (Solar! Child speaks in the background) Yeah, solar. I would choose a solar system capable of producing energy for cooking. Solar system is good because even when there is no sun it works. Solar systems have batteries that are charged by the system itself, and the battery can be used at night for other purpose when the sun is gone.

**Interviewer**: In closing, do you have anything to say?

**Interviewee**: Thanks for coming. In addition, I would like to say we embraced biogas digesters, but you have heard the all problems. If it is possible, ask people back home to come with a technology to save us from this cooking predicament.

**Interviewer**: Point taken. Thanks for the interview.

**Interviewee**: Welcome.