**BIOGAS ASSESSMENT PROJECT**

**Site ID: 14**

**Date: July 20, 2022**

**Interviewer:** Thanks for the interview. This will be a short interview as you discussed more about the digester with my colleagues. So where did this digester originate?

**Interviewee:** This one was, eeh, was originally planted here some five, six years ago

**Interviewer:** Okay, who made this design?

**Interviewee:** This digester right here was design by [name redacted], a Japanese man. But, Malawi Industrial Research did the whole technical part of it.

**Interviewer:** Oh, okay, okay.

**Interviewee:** Yeah… Yeah, they are the ones.

**Interviewer:** Who funded this?

**Interviewee:** It's MEET [Malawi Environmental Endowment Trust] through COPRED.

**Interviewer:** So, who built it?

**Interviewee:** With the assistance from the community, we provided casual workers. And, for the building itself we provided a builder – That is COPRED now.

**Interviewer:** So your role was uh?

**Interviewee:** To see that this thing is here and that it is functioning.

**Interviewer:** So, how were you selected as a beneficiary?

**Interviewee:** We had a project here and we saw that people were suffering in terms of sourcing fertilizer; as a result, they were not harvesting enough. At the same time, we saw the community had many cattle, but it was not been used productively. So, we thought of a way of utilizing the manure to produce renewable energy; gas that people could use for cooking and lighting.

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

**Interviewee:** Yes, we did.

**Interviewer:** So, how did you know about biogas?

**Interviewee:** We had a certain project in a certain area, and we visited people who were doing that; we appreciated a certain project in Chikwawa, an ECD projects which involved school going people, and at the centre they were using gas biogas to prepare porridge.

**Interviewer:** ECD is Early Child Development?

**Interviewee:** Yeah, yeah! That is early child development.

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

**Interviewee:** We expected that people in this area would start using gas for energy. Therefore, instead of using firewood for cooking, they would use gas [biogas] for cooking.

**Interviewer:** You said the designer was Japanese, so what did this Japanese person told you to expect? And, even Malawi Industrial Research, what did they tell you that you should expect from this?

**Interviewee:** He said this digester would produce a lot of gas of which the houses around would use for lighting as well as cooking in this communal kitchen.

**Interviewer:** So this was a communal kitchen?

**Interviewee:** Yeah, this is a communal kitchen.

**Interviewer:** So, how many people were expecting to benefit from this project?

**Interviewee:** We were expecting 25 families to use this system.

**Interviewer:** Did the beneficiaries receive any training?

**Interviewee:** No, we just built it, but it did not reach to a point where we could use it – It failed after commissioning and did not proceed with the trainings. But, I think if it had worked after commissioning it and seeing that the thing was working well, then that is when we could have started training the beneficiaries.

**Interviewer:** From my understanding, you chose this one because there was a need, uh?

**Interviewee:** You sure there was a need. You can see the Soche Mountain there; people from this community were going to Soche Mountain to destroy the trees resulting into deforestation. So, we thought of giving people an alternative to prevent them from destroying trees in the mountain - so this was an alternative. We could not have said, do not go to the mountain if we did not give them anything. Therefore, we gave them this, as an alternative for them not to go to the mountain to cut trees for firewood; and the cutting down of trees in Soche Mountain was heavy; that is why you do not see trees there – it was very bad.

**Interviewer:** So, how did people meet there energy needs before this intervention?

**Interviewee:** They were using firewood for cooking; people were just collecting wood from the Soche Mountain. So, our aim was to lessen that; we wanted them to start using biogas and quit using firewood.

**Interviewer:** How did it work after commissioning? I understand it not work at all. Take me through that.

**Interviewee:** It worked nicely on the testing day, but within a day, it stopped.

**Interviewer:** Do you know how much gas did it produce on that day?

**Interviewee:** With that, with that (stammers) … I do not know the actual amount of gas it produced, but I know that we were able to cook for some time on that particular day.

**Interviewer:** So, could you please quantify it in terms of cooking hours or cooking time?

**Interviewee:** Some people cooked some beans. There were three families cooked beans on that day, and one family cooked nsima [hard porridge] on that day. Therefore, after some time the gas started coming declining, and it went off completely. In regards to lighting, they did not use it for lighting because we did not provide with lightning lamps.

**Interviewer:** So, all these people you are talking about, where they cooking simultaneously or one after another?

**Interviewee:** They were cooking one after another because it had one stove.

**Interviewer:** So roughly, how many hours did it take? 5 hours?

**Interviewee:** Yeah, it took 5 – 6 hours.

**Interviewer:** Okay, okay. Nice. Nice. So for this to run, what were the operation requirements?

**Interviewee:** For this to run, it required manure and water.

**Interviewer:** Uumh, which type of manure? Human manure?

**Interviewee:** No, cattle dung because people here had many cattle, so we thought it could run easily. We felt that it could be easy for the people to bring manure and mix with water for this to run. So, these were the only things that were required.

**Interviewer:** How were you planning to collect the dung from the community? What was the procedure or plan for gathering manure?

**Interviewee:** There was a committee, so the members of the committee would have been collecting the manure from the people.

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

**Interviewee:** We have a reservoir there where we gathered water because water is scarce here; people walk a long distance to get water. So, we provided that reservoir there so that people would draw water from the borehole and the river and put in that tank; and then the manure was put in manure in this tank, and then mix them together to ferment for period of 3 days. Thereafter, the mixture would go into the chamber for fermentation and gas production.

**Interviewer:** So, what was the ratio of cow manure and water?

**Interviewee:** At first, we started with five wheelbarrows of cow manure and 100 liters of water.

**Interviewer:** So, can you be clear on this, who was responsible for feeding it? The committee?

**Interviewee:** Yeah, the committee; there was a chair and secretary alike. We were just supervising.

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

**Interviewee:** We discussed with the community that people would need to pay to cooking various foods in the community kitchen. Therefore, the committee and people would have agreed a certain fixed fee for the service; and the money collected during that period was for repairs.

**Interviewer:** So clearly, this did not meet the needs of the community. What were the gaps?

**Interviewee:** A lot of them; the challenge of water was another one. People had to walk a long distance to get water. Another challenge was manure; it was difficult to source manure.

**Interviewer:** How many kilometers was that?

**Interviewee:** There are two sources; there is a borehole and the river. So, people were to walk one – two kilometers to get water. Another challenge was dung. You know, sometimes animals get infections sometimes and they die. Therefore, manure was a challenge; to get manure was a challenge.

**Interviewer:** So, the main problem was when people were cooking, the gas started diminishing?

**Interviewee:** Yes. - The flames at first was coming out nicely and strongly, but when one woman started cooking been it took longer. Then after that, gas started coming little by little, and it ceased.

**Interviewer:** How long did you use it again?

**Interviewee:** Only for a day.

**Interviewer:** Sad, sad! We are 70% of through our interview. So, after that, what did you do? Did you fix it? Or, what did you do?

**Interviewee:** No, we had no funds. The funds we got from MEET were exhausted. In addition, the community could not have afforded or managed to troubleshoot it. And, the one who designed this went home soon after finishing construction work.

**Interviewer:** You mean the designer was not there when you were commissioning it?

**Interviewee:** Yes, he was not there. He was not there. But, there were officers from Malawi Industrial research who tried to troubleshoot it to no avail. Then, as COPRED, we did not continue to fix because we had no funds.

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

**Interviewee:** Yes, this information would have helped. Moreover, I think they should have given us a manual to see how to operate this… So, this could have been a guiding tool.

**Interviewer:** So, how would you describe the current state of this digester?

**Interviewee:** As you can see, right now, this can be maintained. As you are aware now, there are persistent power cuts; and people are crying over electricity; and I’m sure many people from this community can be helped in terms of electricity and cooking, if it can be maintained.

**Interviewer:** Do you think this digester can be maintained?

**Interviewee:** It only worked for a day so chances are high that a technician can fix or modify it, and make it.

**Interviewer:** So, in your opinion, what caused this to fail?

**Interviewee:** Maybe there is a leakage - I think so. Because, if it there was no leakage, gas would not have been diminishing. I believe there is a leak, and gas was escaping through that leak; otherwise, it would have been working up to this day.

**Interviewer:** So you have said that, because this did not we work, people are still using wood for cooking, uh?

**Interviewee:** Yes, now they are cutting down trees for firewood; but now since the trees are finished in Soche Mountain, I do not know exactly where they are getting the firewood, and how they are surviving. I think people are now using trees from their homes; some are using maize stalks from their field for cooking.

**Interviewer:** In regards to feedstock, you said when you were starting this project you saw that people had plenty of cow dung in this community. So, now since the project did not succeed, what are people doing with the cow dung?

**Interviewee:** They are just applying in their gardens.

**Interviewer:** You think so?

**Interviewee:** Yeah - sure.

**Interviewer:** Yeah, we are 80% through with our interview. We are only remaining with five questions regarding finances. Okay. So how much did this reactor cost?

**Interviewee:** That one I have forgotten, unless I get back to my books, then I can give you the correct figures.

**Interviewer:** But, the funds came from ?

**Interviewee:** The funds came from Malawi environmental endowment Trust (MEET). It is MEET.

**Interviewer:** That is where [name redacted] works, right?

**Interviewee:** That is where she is, and she knows bout this.

**Interviewer:** Oooh [Laughs]So, how much labor went into this?

**Interviewee:** Here the main workforce was the builders only. The government research people from Industrial research only got allowances, fuel, and we paid them for transportation of these materials. We purchased some bricks and we paid the builders; the community provided collected sand, water and transported the bricks... The community also dug the holes too.

**Interviewer:** How many people where involved in digging?

**Interviewee:** The community people came simultaneously as it involved the community and the chief arranged for that, so it is hard to know how many people worked on this. But, the chief might know.

**Interviewer:** So, I can imagine there were a number of people... Who did the masonry work?

**Interviewee:** This was a design made by Shikawa, so the builders were just building according to the design.

**Interviewer:** How many builders built it?

**Interviewee:** They were two of them.

**Interviewer:** What kind of special item had to be imported from another country?

**Interviewee:** Nothing was imported. Everything was local.

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

**Interviewee:** Biogas is good as it is a natural gas and it`s user friendly. With biogas, you do not damage anything – you do not damage the environment. Biogas only recycles animal manure, which is very important; and with that, you get gas for cooking as well as fertilizer. Therefore, this [Biogas] is nice.

**Interviewer:** Yes, indeed, biogas is a good thing, but it is not progressing. Why do you think about its failing?

**Interviewee:** It is about awareness I can say so; because if people could have know this before, and practically see what it does, I think most people would go for this.

**Interviewer:** If you could have designed your waste intervention, what could you have chosen instead of this one?

**Interviewee:** They are two; I would have chosen biogas because you get two products from it; you get gas for cooking and fertilizer, so it is more like killing two birds with one stone. In regards to waste intervention, if we had waste collection points in different area, it would have helped us; because people would have been collecting manure, while also we creating a clean environment and make places health. Thus, the waste from these collection points would need to be transferred to a one dumping site for decomposition, and then people could have been getting decomposed waste and apply it as manure, rather than dumping waste anyhow.

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

**Interviewee:** I believe and trust that you are going to come again. This is not the end of the journey. I believe and trust that you are going to come back and see how best you can help the community to maintain this biogas plant.

**Interviewer:** Okay, thank you.

**Interviewee:** Thanks