**BIOGAS ASSESSMENT PROJECT**

**Site ID: 58**

**Date: November 16, 2022**

**Interviewer**: First off, where did the digester originate from?

**Interviewee**: It came from a company called Ecogen.

**Interviewer**: Who designed it?

**Interviewee**: The same company designed it.

**Interviewer**: Okay, who funded it?

**Interviewee**: Ecogen installed the system here, so that they could occupy our premises as their office. Thus, instead of paying cash for the digester, we agreed that they should use our premises for some months, I think it’s 6 or 8 months. I’ll need to check my records to confirm the duration though.

**Interviewer**: Sure. Who built it?

**Interviewee**: Again, Ecogen built it.

**Interviewer**: How many people from Ecogen installed it?

**Interviewee**: In the first place, three people came, but they let one man to do the installation.

**Interviewer**: Okay, how many people from your organization were involved in the installation or construction phase?

**Interviewee**: The people from Ecogen did everything. No person from our office was involved in the installation or construction phase.

**Interviewer**: What was your role as [location redacted]?

**Interviewee**: Our role was to oversee the work, but then we didn’t have any experience with it, so we couldn’t provide expertise. So, we were only there to see that it was installed and to use it after.

**Interviewer**: What were your expectations as [location redacted]?

**Interviewee**: Our expectation was to enjoy the benefits of biogas namely; use it for cooking, secondly, they told us that we would be getting bio-fertilizer, and lastly we expected to conserve the environment because by using the digester it meant that we wouldn’t cut trees as well as use inorganic compounds as fertilizer that harm the environment.

**Interviewer**: So, from my understanding you were told about bio-fertilizer as well as that you would be getting energy for cooking. Apart from this, was there anything else you were told i.e. that could use it for lighting?

**Interviewee**: The system we have here doesn’t provide lighting. But they told us that it’s possible to get energy for lighting with a different digester system. If I’m not mistaken, they said our digester produces a relatively small amount of gas, so it’s hard to use it for lighting as well. But, then our concern was not on lighting, so we didn’t mind a lot about that.

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

**Interviewee**: After installation, the only taught us how to operate it; they simply showed us how to switch on and off.

**Interviewer**: I can also imagine they told you about feedstock preparation and all that…

**Interviewee**: Yeah, they told us what to feed it with, and what not to feed it, and how many hours we would be getting out of it - so it was just basic information to keep it running.

**Interviewer**: How many cooking hours were you told you would be getting out of your digester?

**Interviewee**: They said the maximum cooking time is 4-hours a day.

**Interviewer**: Okay, did you learn about its maintenance?

**Interviewee**: We were not trained on maintenance. They promised us that when the digester is damaged or faulty they will be responsible for its maintenance for a certain period. But, since it was installed, we haven’t had any issues.

**Interviewer**: You are saying your expectation was to use it for cooking and as a bio-fertilizer. I can imagine this was a need for you, so how did you manage to meet these needs before the digester?

**Interviewee**: As [name redacted], we encourage the use of organic fertilizer as well as clean cooking, and we've been doing this before the system was installed. For example, we harvest urine and human manure to make compost, so biogas enhanced our way of doing things in regards to use of organic fertilizer.

**Interviewer**: To run a digester you need cow manure at one point or the other, where is your source of cow manure?

**Interviewee**: We use kitchen waste, for example, vegetables leftovers as the primary feedstock. And, sometimes when we find cow manure, we use it but it’s a rare occurrence.

**Interviewer**: What times do you find cow manure, and what times do you use it?

**Interviewee**: We do not have a specific time we use dung, and if we have used dung before it’s only once or twice because we had it at that point.

**Interviewer**: How did you manage get dung that time?

**Interviewee**: One time our executive director went to Mangochi – Monkey Bay, and got some there.

**Interviewer**: How did you manage your feedstock i.e. food waste before the digester?

**Interviewee**: Like I said earlier on, we make compost, so we use food waste for composting.

**Interviewer**: How did you start up your digester?

**Interviewee**: In the very beginning, we used fresh cow dung to start up the gas production process. Then, after final installation, and after some countable weeks our digester was ready, and we started using it. After that, that’s when we started feeding it with food waste.

**Interviewer**: How many bags of cow dung did you use? And, how much water did you use too?

**Interviewee**: Ecogen was responsible for this task, so I’m not quite sure about the quantities of cow dung and water which they used. But, if I’m not mistaken, they used one bag (50kg) of cow dung. And after a week or two, they realize that it wasn’t responding according to their expectation. So, they fed it with another bag of 50 kgs. So in total, I can say they used 100kg of cow manure – Though, I’m not very sure on this because it was Ecogen’s responsibility.

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

**Interviewee**: If I’m not mistaken, they gave us a ratio of one to three or four. That is the ratio of cow dung to water. So, there was more water in the feedstock, and we use the same ration to make feedstock now.

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

**Interviewee**: They told us that in normal circumstances it takes three weeks. But, around that, time the weather was cool, so it’s took one month and two weeks.

**Interviewer**: So temperature affects the duration of starting up?

**Interviewee**: Yeah – according to our experience and what we were told, that’s true.

**Interviewer**: How did your digester work after commissioning? Or, how much cooking time did you get from it?

**Interviewee**: Like I said earlier on, they promised us that the maximum cooking time we would be getting from it in a day was 4 hours, if the bag is full. But, from our experience, we have never used it for 4 hours even when the bag was full like they said. The maximum cooking hours we got from it when the bag was full is 2 hours.

**Interviewer**: Even now, you still get 2 hours?

**Interviewee**: We don't normally use it continuously for 2 hours. So, sometimes you use it for 20 minutes for the whole day. Sometimes, we use it for an hour cumulatively.

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

**Interviewee**: The main thing is about feeding it constantly to have enough gas. So, for us to use it regularly, we constantly feed it. Also, if you want to use it to make sure that the gas valves are open in order to get gas at the stove. So, basically it’s about feeding it and controlling the stove.

**Interviewer**: How do you prepare feedstock?

**Interviewee**: It’s basic; we remove the hard indecomposable things like bones and then crush the rest of the feedstock. Afterwards, we fill water not contaminated with soap, and then feed the digester.

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

**Interviewee**: We feed it on daily basis but the quantity is not the same every single day because we only depend on food leftovers which varies everyday

**Interviewer**: On average, how much feedstock do you feed it with?

**Interviewee**: On average, I can say we feed it with 2 kgs of food waste.

**Interviewer**: I want to have at least an idea of how much food waste is generated. How many people are here?

**Interviewee**: We are mostly 3 people – sometimes, we are 4 or 7 people. In a week, I can say 3 people are here in 5 days.

**Interviewer**: How long have you used it again?

**Interviewee**: It was installed in June or July. I remember it was winter season that time. It’s been 5 months now.

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

**Interviewee**: It meets our needs, but it didn’t meet our expectation in regards to what they told us. For example, I did mention that they told us that we would be getting 4 hours of cooking time, but unfortunately even when the bag is full it doesn’t last up to 4 hours. So I can simply say we are not getting exactly what we were promised. In regards to bio-fertilizer, I can say we are getting what we expected.

**Interviewer**: What do you get from your digester, is it effluent or digestate?

**Interviewee**: We get effluent (liquid)

**Interviewer**: What do you use it?

**Interviewee**: We use it as fertilizer for our vegetable garden and fruits.

**Interviewer**: Some of the users I have talked to use the effluent as a pesticide, do you use it as pesticide?

**Interviewee**: No, we only use it as fertilizer, and that’s new information to me – I had no idea about that.

**Interviewer**: Yeah, what they do is add ginger or pepper to the effluent, and then put it a sprayer. So, they spray vegetables, maize and whatever with the effluent, and they say it works.

**Interviewee**: Oh, that’s interesting. Maybe we should try it.

**Interviewer**: It’s been 5 months now since it was installed, what challenges do you have or have you faced?

**Interviewee**: There haven’t been many challenges. The only thing is that we generate and feed it with a kilogram or two per day, which I feel is not enough. So it’s a challenge to buy food waste from the market, or to ask from other people to provide. Except that, I don’t see any challenge.

**Interviewer**: Were you given information on a paper about common problems associated with digester failures, their causes and solution? For example, were you given information that if a bag shrinks, it means there is a leakage or it needs to be fed etc.

**Interviewee**: We were only communicated that if we see it shrinking we should feed it. In regards to troubleshooting and solving issues, that information was not given to us. But, like I said, Ecogen is in our premises and we agreed that they are responsible for its maintenance. So, I believe at the end of our agreement, when they are handing over the responsibility, they will provide us with that information because that’s the only way we can maintain it.

**Interviewer**: Has the digester ever malfunctioned? I mean, has there been a day where you wanted to use it but failed?

**Interviewee**: No, if it doesn’t work, it means there’s no gas because it hasn’t been fed. But, it has never malfunctioned.

**Interviewer**: So, are there certain times you fail to feed it that it reaches a point you fail to cook as a consequence?

**Interviewee**: It doesn’t necessarily stop working, but it may work for 5 minutes or so then go off because it has run out of gas.

**Interviewer**: What do you do if it runs out of gas while cooking?

**Interviewee**: We have other methods of cooking. For example, we use LPG gas, and sometimes we use a fuel-efficient cook stove that was built at our premises, so we use two or three pieces of wood to cook.

**Interviewer**: Where do you get the wood?

**Interviewee**: We have trees around from which we get dead wood.

**Interviewer**: We have done 80% of our interview. We are remaining with 20%. How much did the reactor cost?

**Interviewee**: It’s worthK500000.

**Interviewer**: Oh, that’s a lot.

**Interviewee**: Yeah, it is.

**Interviewer**: Did you or your organization contribute anything in kind?

**Interviewee**: We provide them space for their office. The agreement was that they would install us a digester and we would provide space for their offices.

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

**Interviewee**: Of course, it’s imported but I don’t know where exactly it comes from.

**Interviewer**: Some digester bags are placed in the hole that is lined with a brick wall or plaster, is your digester now lined?

**Interviewee**: No, the hole is not lined.

**Interviewer**: Did they tell you that it is supposed to be lined?

**Interviewee**: No, they didn’t.

**Interviewer**: We are remaining with two questions, what is your opinion of biogas?

**Interviewee**: Personally, I think biogas is a good innovation because it is used as a source of renewable energy. Secondly, it can be used as a source of bio-fertilizer. And, I think it is also a good innovation for the reason that it mitigates the effects of climate change. And, most of all it’s a clean source of energy. So, I have nothing but positive things to say about it.

**Interviewer**: There is nothing perfect in this world; everything has its limitation and negative side. What are the cons of biogas?

**Interviewee**: I can say it’s costly, so it can’t be accessed by an average person. In regards to the system itself, I can’t think of anything else negative.

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

**Interviewee**: I would have reduced the size of the digester, I think it’s too big and it occupies a lot of space. Secondly, I would have worked around it to increase the cooking time it generates or produces. As I said, they said it gives 4 hours but unfortunately, it only gives us 2 hours or less.

**Interviewer**: Thanks for the interview, any last words.

**Interviewee**: There is nothing. Thanks for calling. Good luck with your projects.

**Interviewer**: Thanks.