**BIOGAS ASSESSMENT PROJECT**

**Site ID: 37**

**Date: September 24, 2022**

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

**Interviewee**: It is via Ecogen, which gets it from Kenya, and I think, that is a Mexican company from Sistema.

**Interviewer**: Okay, who funded it? Did you use your own money? Or, it is the organization?

**Interviewee**: Yeah, the organization [Gulugufe] funded it. We are an NGO from the Netherlands.

**Interviewer**: Okay, so as an NGO, what do you do?

**Interviewee**: Yeah, we focus on coach, life coaching with people, and we also do a lot of things on sustainability. So, we do sustainable farming sustainable and sustainable buildings; all these buildings are made of mad and there is no cement or anything involved. So, we train in that – we also train in sustainable farming, and then also coaching, and focus in mindset change in a way of getting people to having a sustainable future instead of, ah, family members having nothing, like living the next generation empty handed like with the trees. So, we are broad, we are not just about trees.

**Interviewer**: So, you are from Netherlands?

**Interviewee**: Yeah, I am from Netherlands.

**Interviewer**: How long have you been here?

**Interviewee**: Yeah, I came here first time in 2006 and I was here 8 years. And then, I went three years back to Netherland and now I am here since 2017. It has been almost 13 years now, but always in Chikwawa.

**Interviewer**: Don’t you find Chikwawa too hot?

**Interviewee**: Yeah, it is hot. But, this year is very nice. It’s not too hot year. We have only had this two week hot. But, since the flooding in January, Chikwawa has been cool.

**Interviewer**: Nice. When was the digester built?

**Interviewee**: It’s was built about one and a half years now. Then, after 3 or 4 months after that, we got it in use. That’s probably Feb or March 2020.

**Interviewer**: Did you know about biogas before? Did you learn about it after Ecogen came?

**Interviewee**: No, I knew already about biogas, but the thing is that most biogas systems, which I knew were focused on kitchen waste. And, I don’t see that kitchen has waste, so we feed our kitchen waste to animals. So, the word waste is wrong, so I don’t want to use it as biogas. I wanted to use it as manure, but just took some time to find the one which can also do very well with manure, so when I find that one, that’s when l started using it. But, just because I didn’t want to use kitchen waste in my digester.

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

**Interviewee**: Well, officially, it has capacity of six families and we are also setting up a restaurant, which in a couple of weeks we want to open up. So, the purpose was also that we could cook with a six-family digester probably most our meals with that. So my expectationwas very high, but it’s not reaching my expectations yet. So, I hope it’s changing because I’m not using it to the full capacity. I’m using 40kgs to 50 kgs a day and I can go up to 180 kgs that’s because I said we’re not in full use, but still from 40 or 50 kgs I would have accepted more than what it is supplying me now. So, my expectations was a bit high than the results up to now.

**Interviewer**: What did the installers tell you to expect? What did Ecogen tell you to expect?

**Interviewee**: They just give you their forms, what they have from Sistema, like if you put this much in it can be for six families. So they just to give you all the statistics, which comes with it from Sistema. And also, that time when they installed this digester their experience was not big enough yet. But what I did find is that they sometimes went a bit too fast in the success, and they should have waited a little bit. It is success not when we have a flame, but when can use it longer and not just one flame. But, that’s how it sometimes goes.

**Interviewer**: Did you receive any training from the installers?

**Interviewee**: Yeah, just very, very basic. But, maybe it’s enough and some questions come later. Sometimes, I feel their knowledge is not bad, but it’s limited when bigger challenges come. And, with the bag we have, which is very big, I think we were the first ones in Malawi, I could see that they were sometimes maybe thinking too much, or thinking too easy and trying out on our bag. So, we were a bit of an experiment at the same time, which I can understand because we are the first ones. But, it’s getting better, yeah, they are getting better.

**Interviewer**: Why do you say they are getting better? I mean, what can you point out and say they are getting better?

**Interviewee**: Well, because like now, for example, with the wall they build around it, they are now doing it more, at least that’s what they tell me. But, they are making it more complete, so they have learnt, and are adding things which before they were not doing. But, like what I said if the challenge gets too big, then you see that they are lacking a full understanding of how it works – thinking outside of the box sometimes, like I said in the beginning they put all these pipes, and then it didn’t work. Then they came again to change the allpipes that was all on of their cost, but it was so trying out – we were an experiment. It didn’t work so they came to do something else. But, the thing is when you sell something, that’s what I think, you have to have enough knowledge, so your customer is happy, in one time, and then you have small mistakes or small adjustments you can come back, but these are big adjustments that they had to make. But, I think if they have learned from that. And now they have new guys before he was on doing it himself, Clement, or he was coming with his friend but not more. And have also acknowledged that some of his guys are much better than others. Now, he has even a Blantyre guy, so they are not coming from Lilongwe anymore. But, it seems they following sometimes a program, when you go outside the program with your problem then they repeat the same answers, but they are not giving you a real answer, you get me? Like I was explaining, I said I don’t think that’s the problem, and then he’s saying it’s the problem. I said I think the problem is that valve has to be moved and he says no it will work, but yes it will work but because it’s down it will give a lower supply and it’s more challenging to get more gas out. But, if it’s on top, I think it will go much easier. And, on their pictures, it’s even showing like that. Then, I don’t get an answer on that he says he doesn’t know. And I think the people from Mexico or Kenya they probably know the answer. But, they still have to learn more things and yeah, and we’ll see how that goes.

**Interviewer**: So, how many people were trained? It just you, or some other guys too?

**Interviewee**: There are a few people who know how to do it. I’m not filing the bags, but there are people who fill up the bags. And, sometimes they walk on it to shake it a bit and like that. And in the kitchen, they know how to switch it on and switch off. And if there is water log, they know how to disconnect. So, that’s what they know, yeah. And, I also explained to them how the gas is made; like that, it is made from bacteria. But, I don’t know how much is staying in people’s heads. (Laughs) Gas is gas, it doesn’t matter who makes it, and I don’t care. I put manure, gas comes out, and I don’t need to understand the chemical process.

**Interviewer**: So, how was the training like? Was it basically on theory and operation? Or, did it touch on maintenance?

**Interviewee**: I think the theory is more like in practical, so I explained to them how it works, at the same time we doing it. And, I think that’s the same with maintenance, if it goes well it doesn’t need a lot of maintenance. It’s just goes – or is it maybe the water log. So the water lodge in the beginning, I have to say that the water log I found them very bad. It had water in it, it was blocked every day, so you understand that’s very not user friendly. Every day, then you had to go in a small hole; and it’s very difficult to get it the rid off to take out the water, so doing that every day was not user-friendly. And, I asked them to make bigger water traps like water can. But, before that, it was like every day it was full. So, I was like if this is the case, this is not working. So, that’s also better now. And, what I also noticed is that they don’t fit it into the environment. So, there, they made a connection in the middle of the path, and that’s not user friendly, you get me? But, I know this happens more in Malawi that it’s not always thought about. I would put it corner on the side, and they put it in the middle of the path with a lid on. So, people in the dark they maybe miss it and fall over it. But that has nothing to do with biogas. That has to do with installment. So, it can be made better and user-friendly.

**Interviewer**: You have said at first they used pipes different from what you have now and didn’t work. And, they came again with different pipes and it worked. What was the dimension of that the pipes?

**Interviewee**: It was 32 mm and with the short distance of that kitchen, which is 10 - 15 meters, it was fine. But, this kitchen is maybe 20 meters so that’s when the problem started. Then, they said you have pumps, then you get pumps but the pumps don’t always work as well, or they have solar panels with it, but it’s not well installed. Sometimes, I think they were trying to do it a bit fast. So, then in the end they chose to change to a 50 mm pipe, so that kitchen was supplied. But, we even had a kitchen over there that is like 50 meters or something, and even with the pump, it was too difficult to get it fixed.

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

**Interviewee**: I was using gas bottle from Afrox, LPG gas. What we do with things here is sustainability, and that’s why decided to make our own gas because it also fits in sustainability story.

**Interviewer**: How much LPG gas were you using per month?

**Interviewee**: It would be different if we used it in the restaurant. We would use it more. So, we used 9kg or a little bit more than that per month - Not a lot. And, we also use wood stove for staff meals. For a restaurant, you will need a lot more, but we haven’t run a restaurant with gas bottles. So that’s what I can give you a comparison for, unfortunately.

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

**Interviewee**: What do you mean?

**Interviewer**: I mean, what you put in the reactor? Or, what you feed the reactor with?

**Interviewee**: We put cow manure.

**Interviewer**: How did you manage cow manure before the intervention?

**Interviewee**: We used it in the gardens, but also we didn`t have many cows. We had only 1 or 2 cows. So, then we just added more cows to use our own cow manure. So before, it would just go into the gardens. Now, it still goes into the gardens but first in the digester.

**Interviewer**: How did it work after commissioning? But before that….

**Interviewee**: It took about two months or something before it worked. And, it was like what I said, at short distances was good, but at long distances it was so good. But, every day we had some gas. Yet, it is not as much as I expected. I mean, if you look at their statistics, this thing produce more gas than in real life. But, companies always make it better than in real life. It’s many companies that do that. But, because I haven’t used it in full capacity yet, I can’t say how less it. Still, I think it is giving less than what they write down themselves. And, maybe also it is tested in perfect conditions in Mexico or wherever they have made it.

**Interviewer**: On paper, how much gas does it produce?

**Interviewee**: They keep it at 6 families a day. That’s how they write it. It’s not in cubic meters or something like. They just say six families can easily do this in a day. But, I’m using it at the capacity of two families or two and a half families, and I don’t believe that two families can cook two meals with this in a day. I don’t believe it – and I’m sure it can’t. That’s impossible.

**Interviewer**: How much cow manure did you start it up?

**Interviewee**: At first, we had a big load in; we put 10 full bags after we had already put water in. And then we kept feeding it everyday with two or three buckets of fresh manure and we mixed it with water still. So that was like maybe 30 kg a day still it was producing. [Now] when we use it more we increase the feedstock as well. So if we want more, we put more money. Otherwise, we would be wasting.

**Interviewer**: Where did you get cow manure that time?

**Interviewee**: Now, we have cows, but that time we got the manure from the village. There’s a lot of cows in Chikwawa, so if I want cow manure I can get it from many places here.

**Interviewer**: Did you buy them?

**Interviewee**: Yeah, we did.

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

**Interviewee**: A bag of 50kg was K300 or 400. A bag here is not as expensive as in Blantyre, were you pay K2000 or K3000... There are no customers here, so they sell something or they sell nothing. And, in most time they don’t charge you the manure, but for the labour of loading. So, Malawians get it for free because they fill it up themselves. But, the bags don’t get full, maybe the go ¾ because the bag is very hard to carry when it’s full.

**Interviewer**: Okay, what were operation requirements?

**Interviewee**: What do you mean?

**Interviewer**: What is required for it to function?

**Interviewee**: We mix cow and water to a certain ratio. I have forgotten but the people who feed it knows that. So, with that, the gas comes out, and if there is a problem like a water log or something, we get it out. So, it’s about feeding it everyday.

**Interviewer**: How do you exactly fix the water log problem?

**Interviewee**: It’s a clear pipe going down, so because water is heavier than gas it accumulates there. So, to deal with it we open the rid and get the water out, and cover it again. So, gas stay up the water, because that`s what gas likes to do – stay up.

**Interviewer**: (laughs) how do you prepare the feedstock exactly? Do you have a mixer, hand or something?

**Interviewee**: We have a wooden stir, which our people made themselves and the use that for mixing the feedstock. So, when they are mixing it, and they also take out some rubbish..

**Interviewer**: How many people are responsible for feeding it?

**Interviewee**: We have two.

**Interviewer**: Did they go for training too?

**Interviewee**: Yeah, I explained to them. So, most of the time one of them is available. They work in shift like manner. And, it’s basically the same people who look after the cows that feed it. Then, we have people from the kitchen that uses it, and if there is water log, they fix it. So, it’s like different groups of people doing different things on it. So, that`s how it works in practice. And, then there still people who know much about it, but don’t do much with it. They are only needed when there is a problem.

**Interviewer**: What are the maintenance requirements? And, who is responsible for maintenance?

**Interviewee**: Most of the maintenance, we do ourselves. But, if there is a big problem, like when gas was not coming I called Ecogen, or when it`s twisted. So, Ecogen is doing it because I think they have the expertise. But, it’s what I said it’s not always like that. So, sometimes I feel they come for nothing, and are not add anything to our solution. But, yeah, that happens (laughs)

**Interviewer**: (Laughs) is it meeting your needs?

**Interviewee**: Not as I expected. But, I hope it will still get better, and also if we can come to a solution on the position of gas valve, then I hope it can still do better. It’s nice, but it’s doing less than what’s on paper. The paper looks better than the reality. But, it works. It`s not like it doesn’t work.

**Interviewer**: Did you communicate with Ecogen regarding this? And, if you do what did they say?

**Interviewee**: I spoke with them to tell them that it's not performing well yet. But, it also has different reason, and also I haven’t used it full capacity like I said. So, that’s the thing, which is not there yet. So, I haven’t really confronted them because I don’t have the 100% facts when it’s in full capacity. Because, I think that’s when it becomes a fair thing. But, I'm expecting that if I use it in a low capacity, I can like a bit equally divide. So, if you can put 180 kg and you put 45 or 50 kg in, then I can at least expect that maybe, if it were six people then at least I would say 2 families should use it. But, that’s not what it is, so we have the future is going to bring. Then, I heard your experiences I can say Ecogen is way much better than the others. But, even they still have to learn. But, Clement is a guy who studied economics, and he is learning on the job. So you can say he’s a salesman, but not the technical guy. But, he’s getting them around it, I think his company is growing and he is more people around him. So, I hope he can find the right people.

**Interviewer**: You have been with it for more than a year now, what challenges have you faced?

**Interviewee**: The water logs, the wrong pipes, but that one had to do with the knowledge on their side. And, now I’m facing that it is still twisted, so I don’t know how it can work with that. So, because of these challenge I can’t say there has been a time it has been fully functioning well for more than three weeks. There has always been something that had to be changed or adjusted, or something to learn. Now that we have changed everything, we even ourselves we disconnected a house [House 50 meters away from the digester] there because they couldn’t find a solution to that. So, we have also made our own adjustments, because they kept trying but we already realized that they also don’t know what they are doing. And, in continuing using as an experiment, I don’t believe that’s the way forward because we want to use it. So that’s also, why we make our own adjustments, which they know about.

**Interviewer**: Oh, you always communicate?

**Interviewee**: Yeah, yeah, and when they came they saw that too. So, that’s also there learning process, but how long can you experiment. Of course, he was charging me low prices for that, and sometimes coming for free. It’s only lately that he has started charging. So, that’s so nice of him. But, they made couplings, they just pushed an STP coupling in a 50 mm pipe, I don’t know if you know STP? Like they connected a female coupling, they forced it and made the 50 mm bigger and they forced it in their and put a lot of rubber strips – you can’t do that. So, we were losing all the time gas and we didn’t know where it was, till we dug it up, and we were like look at what they’ve done, and nobody knows who has done it. But, it’s one of their guys. But, also things like that, it’s unprofessional because of a lack of knowledge. Of course, they have learned, and I hope they will use the experience here with new customers’ right.

**Interviewer**: I want to know when did you start getting the waterclogs, and how did you know it?

**Interviewee**: Because there was no gas coming. So, then you start checking the water log and you find out that it’s everyday. And, also in the beginning, they also put water logs not at the lowest places, but also at places that was not logical. So, those water logs were not working, and then there was just somewhere the pipe was lower and that’s where water was staying because water stays in the lowest of places, which means they didn’t use the level when installing it. But, like I have said, it’s a learning thing and they didn’t think about it. The problem is that they have experimented it for a long time here. So, for water log you just find out that gas is not coming and you just check, and if you see water you just take it out, and it works right away.

**Interviewer**: You said the problem of water log was happening on a daily basic, how did you manage to get rid of it once and for all?

**Interviewee**: We just added water logs along the pipes, and then we put the new pipes [50 mm in a leveled manner. And the problem was also sometimes that the valve was touching the water that was creating more water [“madzi”], I don’t know who is listening to this, which was going into the pipes. So, it’s those things especially adding more water logs. The first time they added 2 or 3 water valves [water traps] I don’t know water you call it, and there was a ball in there. When there is gas it pushes the ball down, and when there is no gas the ball goes up. But, the problem was that it was always down, and if you want to get the water out you really had to hit it hard. So, we took out those balls because it was not functioning well, and I didn't know how to make it function well. But, I assume that a manufacturer will say it should work with that ball, but I found the ball very annoying.

**Interviewer**: When you have a problem and call Ecogen, what’s their response like? Do they come on time?

**Interviewee**: No, if I call, it takes sometimes like 2 weeks. But, I do think they have an office in Blantyre now that means they won’t be taking long maybe a few days. But when they were in Lilongwe, they would take two or three weeks, and I could not do anything. So, that’s was long time and I assume it’s a solved now with Blantyre office.

**Interviewer**: How many times have they come back?

**Interviewee**: I think it’s 7 to 10 times in two years. And, sometimes I had to wait for a few weeks or a month. [Wife speaks and thinks it’s less – I don’t think they came that many times] For the record, my wife thinks it is less. So, they came back a little bit less than that. But, I’m convinced it’s that. And, I think because sometimes it took them long to come, and that’s why I have a feeling that they came that often.

**Interviewer**: The challenges, I have noted are water log, and not working at 50 meters distances. Apart from the two, what other challenge have you encountered?

**Interviewee**: No. Now, we have restarted again it. And now we have to see how we can solve that valve [valve close to the digester bag], but we have been cooking on it this week. It seems it is fine, so we just have to experiment this in the next coming weeks to see if we can manage longer three weeks without issues. But, another challenge is that when it goes wrong you have to wait for another one month, so I think that’s why many have failed to use it for long like you have said. So, I think they need to teach their customers more than that they are teaching them now, because now they have to come quite often. If there is any problem, they have to come and solve the issue. So they need to explain more, so that the customers can solve most of the issue themselves. The only thing is do they know everything. Like the I said, this last person he sounds more knowledgeable when he speaks, but the words he is saying I don’t get the feeling that he is. I think he's also learning, and he knows standard things and solutions, but not outside that. But, I don’t know maybe because of the digester is big, so also it has big problems. That`s possible. In Dutch, we would say every customer has his own challenges. So, you can’t exactly copy everything the same, because everybody has his own needs and demands. So, I think they have to make it more customer focus, and not believe that every customer is the same. If you have one person, one family, I think you can do almost everywhere the same. But, when you go bigger, you probably need to adjust a lot more to customer needs. And, maybe even teach more. But I’m thinking out loud now (laughs)

**Interviewer**: (laughs) But there is no harm. How would you describe the current state of your digester?

**Interviewee**: Because, it’s twisted it’s not optimal. But, I do believe it can become like that even without getting it straight. But, what I said then the adjustment has to be made, so how it is now it’s not the best. But, it depends on Ecogen to come up with a solution, or then I may have to find a solution myself or your colleague from Uganda, maybe he can give me solutions. And, I have emailed manufacturer from Mexico, because I believe they can give me a clear answer because they are the manufacturers. So, the manufacturer always knows more than the dealer knows, and can offer more solutions. Ecogen is just a dealer, so they may not know more about it than the manufacturers. So, that’s why I emailed them, but I haven’t got any response yet.

**Interviewer**: When did you email them?

**Interviewee**: I emailed them on Monday, which is about that valve. Why is the valve on your pictures on the middle, and why it supplied when it’s down? And, maybe in Mexico or in Kenya it’s on top.

**Interviewer**: When you say it’s twisted, what do you mean? What should I see?

**Interviewee**: It’s like this; one side is higher than the other is which means the bag is not on the middle. That’s what I mean with twisted; it should be level, but it is not leveled. Maybe, I should use the word leveled, it`s much easier.. It’s not leveled, but it should be leveled, and that one has to do with their installation. They did it wrong. But the thing is it is difficult because when it’s empty failed it’s folded, and even when you start feeding it the top stays in, and it gets better when gas comes in the end after the outlets are full. Because it the beginning gas can go out via the inlet and outlet. But as soon as it closes with water, then gas can’t go anywhere and that’s when the bag starts to be pushed up, and that’s when you see that it is not leveled. And, that`s when you have filled up the whole bag with 15,000 liters. So, they must know a way that when they put it, they have to make sure it’s 100% leveled. The probably have to push up the corners, and I probably know that is what they said and they even did it here. They blew it up with air, that’s when they put it in, and that’s what surprises me there. They blew it up and it ended up not leveled. But, they said the time they came to empty my digester bag, it was their second time to do it, and they told me you can’t just do it with a pump, but it’s not that easy. The slurry is difficult to pump, and they don’t have a pump, which can pump it. But, they should have. I can understand though, it’s a new thing. I also tried here with a water pump, but it was difficult to get the slurry which settle at the bottom. So, they should get a special pump from South Africa, Mexico or Kenya that can pump the thick slurry.

**Interviewer**: Okay, how much did the reactor cost?

**Interviewee**: I bought it at K1.5 million. And, I think there was a little bit of discount on it because I was one of the first ones.

**Interviewer**: Did you pay at once or in installments?

**Interviewee**: That’s a good question. I think I might have had short installments. I think, I paid it in just weeks, not in months. So, it was short.

**Interviewer**: How many people did the hole?

**Interviewee**: I don’t know how many exactly. But, I think they were three or four people in less than one day, and it depends on the soil and season.

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

**Interviewee**: I think I paid them K15000 or K20000 altogether. But that’s just a rough guess.

**Interviewer**: How much did you pay for masonry work?

**Interviewee**: I think I paid the K25000 and K30000.

**Interviewer**: How many bricks?

**Interviewee**: Maximum 3000 bricks. The bag is 8 by 2.5 meters, I think.

**Interviewer**: How many bags of cement?

**Interviewee**: I would say maybe 4 or 5 bags, because it’s just a bricks and a carpet cloth to protect it. There is no plaster.

**Interviewer**: How much is that?

**Interviewee**: That one is included in the K 1.5 million. They supplied it together with the bag.

**Interviewer**: Since you started using the digester, have you saved any money? Or, are you saving?

**Interviewee**: No, because it has not been fully functioning. But otherwise, I will. Now because we have been so long in the experimenting phase, I hope to get out of that and then we will save money. But, up to now, we haven’t gotten out of the experimenting phase. While in the beginning, I was paying for most of it, now they always ask me money for transport and all that.

**Interviewer**: Honestly, do you think you are going to get out of this experimenting phase?

**Interviewee**: I think so. Also what I have to say is, if you have to buy manure, I don’t think you can save money. I think if you compare a person who is buying cow manure to use biogas with a person using LPG gas, then I thinks it’s hard to say biogas is cheaper. I think you can only save money, if you use your own feedstock. Thus, if you don’t have feedstock, I think LPG gas is…

**Interviewer**: is better.

**Interviewee**: Let’s say it is the same.

**Interviewer**: I thought you were going to say LPG gas is cheaper and better.

**Interviewee**: Maybe it’s really better because LPG gas is not really expensive in Malawi. But, I think people think it is. In other countries, it’s not any cheaper, and it’s cheaper in place where the gas is actually extracted.

**Interviewer**: What is the biggest change in your life now that you have a digester?

**Interviewee**: The change is not big yet now, because of these problems. But, I hope in it. I believe if we can get out of this experiment phase and really get it to work. So, within one year if we are saying the same, then we can say this is too difficult – and then I’ll say it produces gas but not as it promises. But, compared to the ones you visited, this is better. And, to us we are for biogas because it’s sustainable, but most people in would consider the monetary aspect of it, and use LPG gas. And, also because you only need to pay in a month once, they would choose LPG gas. People would also choose LPG gas because it’s not labor intensive. You only need to go the once in a month to refill it.

**Interviewer**: I’m remaining with three questions, what is your opinion of biogas?

**Interviewee**: It is a good thing because I believe we have to create sustainable products, and LPG gas isn’t. And also, we need alternatives to use of firewood in Malawi, and I see it that it is attainable because we have a lot of manure especially in certain areas like Chikwawa, Nsanje. So, this is a good alternative, but it must improve. And, I honestly do believe that if we would say, it’s the Mexican company who produced this and are selling it, I believe if they do it themselves and that’s what they also do, I think it works really great. But, to let it work everywhere great, I think that’s the challenge. So, if that can be solved, like now that I feel that I’m in experiment, so if they quality it in the application can improve, then there is a big future. But problem is that people look at the wallet and that’s why you need quality to convince people. But, now people are just saying it’s sustainable, but in the end people look at the wallet. Even now though we don’t have the trees, but still you can buy sustainable charcoal from licensed sellers or from illegal local ones and people choose illegal charcoal because it’s cheaper. They know that there are no trees, but they would buy the local ones. So it’s the same with biogas, if LPG gas is cheap and easy, they will go for the LPG gas, and not for the sustainable one.

**Interviewer**: So you think it’s a problem with Malawians that they don’t think about sustainability?

**Interviewee**: No, it’s also in other countries. But, I think a shortage of knowledge, and seriousness. For example, the stories you have shared with the other biogas installers, the company involved was more focused on selling their products than having good results. So, it’s more of an earning thing than that passion. They seem not to care about the results and that not about Malawi - it’s everywhere. So, I guess if we start caring about the results, things will go well, and if we give up, we will fail. So, when we think about the giving up it’s about both the companies and the farmers. I think the farmers can also try harder. I'm always trying hard to call Ecogen. But, are the other farmers doing the same? So, it’s about motivation and seriousness. Are people serious? Do people really want it or they want it easy? For example, we do it because we want sustainable solution, and if that’s your focus, then you have to do your best to get it done.

**Interviewer**: Five years from now, where do you see biogas in Malawi? Or, do you see yourself in a better position one year or so years from now?

**Interviewee**: That`s a difficult question. Yes, I hope. If solution can come for the problems we have, then I`m sure we will be in a better position. I can have influence on it, but then I have to it myself and I’m not an expert of this. So, I have to start learning things about it myself, but I hope that Ecogen can improve their problem solving capacity, so they can solve problems that are not normal, and then there is hope. And, let’s hope people become serious about it. So, in 5 years, it depends on companies and the users, and I believe that for companies like Ecogen, they can reach there. I see that Clement is trying really hard to make it a good company, and he wants to do good service and assist. I think what you have said about the other installers that would not happen with Clement. He is wants the product to succeed and he wants to succeed too. If all companies were like that, it can go two ways. Because I know Malawians who are focused and I also know who are not, so if the other group change and commit themselves, then it has a future. And, commitment can come naturally because trees are running out, and when people have to survive, you see that motivation gets bigger. And it’s not as if we can move to LPG gas because Afrox cannot grow so fast to supply all Malawi. Then, the other alternative is electricity, and it’s the same thing ESCOM is not going to change so fast. So it’s difficult to give you a straight answer, but it will depend on how things will develop in Malawi in the next coming year. And, if commitment and seriousness stays like this, then I don’t see that it has a future. And, other companies have to come up because one company is not enough. Of course, he wants to be the only person, but then it’s difficult for biogas in general to progress – and competition is good.

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

**Interviewee**: I would have chosen the same bag, but I would the outlet on top. At some place, I would use better quality pipes. And, I would have designed it different – I would have made a design. I think they just came without a design. They just looked at place they would place the bag and pipes; connect pipes, so that is why the pipes were not leveled like that. So, I would have a better plan to make sure it works. So, like I said they were learning. For example, I would not have used the plastic basins because we all know what happens to plastic when it stays for long on the sun – it is fine now, but it can`t last 10 years. So, quality can be better. The bag is of high quality, but the other things the quality has to be better, and especially with UV, so it's should be more resistance to UV, and PVC is not a strong material – the PVC pipes that are here cannot stand the sun; some of the things they have are not from Kenya, it’s from in Malawi. So, maybe I think they should not prioritize price more than quality. In Netherlands, we had EPDM, it’s also plastic but it’s stronger and it’s 3 times more expensive than PCV. PCV gives you 10 years, while EPDM gives you 40 years. So, long term EPDM [Ethylene Propylene Diene Rubber] is cheaper, and I don’t think you can find it here. And, this company supplies South America, India, Africa and Asia, and you can see they are not in countries where people have the highest income.

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

**Interviewee**: Thank you for this interview. I hope it works. And, I hope it will be communicated should to the companies involved, so that companies here should learn from it. And, who knows, it may improve usage of biogas in Malawi, even though part of is not a very good example, what I have heard from you. So those people have probably lost it, and they don’t believe it anymore, which is really sad. So, I hope more big companies with good business model come, so we will see. A lot of words.

**Interviewer**: How big is your digester?

**Interviewee**: It’s Sistema 20, so it’s 8 by 2.5 meters. And on the website, you can find more.

**Interviewer**: Okay, thanks for the interview.

**Interviewee**: Welcome.