

**Country for the project**

Botswana

**Degree programme**

Industrial Engineering and Management

## Master's thesis about electricity access and solar power in Botswana

### Before departure

I have known since before I enrolled in KTH that I wanted to conduct an MFS project. Ever since I heard about it, I have thought it would be a rewarding and special experience. I wanted to be able to apply my knowledge and learn more in a new context, while also experiencing a new culture, which is something I really enjoy. My first attempt to do an MFS project was for my Bachelor's thesis. Fortunately, COVID hit and made to field trip impossible. I say fortunately because it has been such a great experience to conduct the MFS project as a Master's thesis instead since I had no other courses during my field trip.

When planning for the Master thesis, I and my friend and thesis partner Ellinor, got in contact with KTH Global Development Hub. They have several partner universities in Africa. Some people vouched for Botswana and therefore we decided to start developing a project there. KTH Global Development Hub helped us get in contact with the university, but we developed the project independently. The project we developed in Sweden was about service-based business models for off-grid solar power electrification. When in Botswana, the research question turned out to not fit the context, but we also got a sense of what might be interesting instead. We turned out to evaluate the governmental program for electricity access and to examine the preconditions for residential rooftop solar power adoption.

Before the trip, my expectations were not high regarding what we would be able to accomplish since I had heard that it had been hard for others to be able to conduct interviews. However, I was looking to explore the culture of Botswana. When preparing for the MFS project, I studied for and got the KTH Global Competence Certificate. I also got several vaccines (hepatitis A and B, typhoid fever, cholera, and malaria pills). When staying less than 90 days in Botswana, there is no visa required.

### Upon arrival

We conducted our Master's thesis from January to June 2023 and were situated in Botswana from mid-February to mid-April. When arriving in Botswana, we got picked up by a person from the university (Botho University). There was no organized reception, but fortunately, we met students from Botswana when they studied in Sweden. Therefore, we already knew some people when we arrived.

### Financials

It was generally cheaper in Botswana than in Sweden. We shared an apartment on campus and had separate bedrooms and toilets. The rent was 2000 SEK per month and per person. Transport by taxi is much cheaper than in Sweden (most often 30-40 SEK per ride within Gaborone). Food at restaurants is cheaper than in Sweden. Buying food in grocery stores is not cheap if one buys food imported from

far away, but generally, the prices were lower than in Sweden. Food can also be bought cheaply from “tuck shops” (vendors selling food on the streets and on campus).

### **Accommodation**

As mentioned, we shared an apartment on campus and had separate bedrooms and toilets. The rent was 2000 SEK per month and per person. The student office at the university helped us with accommodation. They were also assisting us when we had problems with the apartment. The condition of the apartment was good enough. Some cockroaches and quite dirty. The beds were okay but remember to bring your own bedclothes. We also brought our own pillows and duvets, but there are some in the apartment. There was no washing machine, but we were able to wash by hand. The kitchen had a stove, oven, microwave, kettle, fridge, and freezer.

### **Project**

The first research question was: How effective are the Rural Electrification Program and the National Electricity Standard Connection Cost Program in achieving electrification in Botswana's villages?

The second research question was: What are the drivers of and barriers to residential rooftop solar PV in Botswana's villages?

One aim of the study was to contribute to enhanced knowledge about the electrification status of villages in Botswana with a focus on how the government programs have turned out. Secondly, the study aimed to increase the knowledge about the potential for companies selling rooftop solar PV directly to power consumers. Thirdly, the study aimed to provide recommendations for policymakers on how to increase the electricity access rate as well as the adoption of residential rooftop solar PV. Furthermore, the study aimed to contribute to academia by adding to the scarce knowledge of electricity access in Botswana.

During our time in Botswana, we conducted around 35 interviews. Our fantastic contact person and local supervisor Ass. Prof. Samuel Chingoiro was an invaluable door-opener. He helped us adapt to the culture in a way that we managed to conduct many interviews. We interviewed representatives from the Department of Energy, Botswana Power Corporation, and solar power companies. We also interviewed energy experts and visited three villages (Gakgatla, Mmatseta, and Segwagwa) to conduct interviews.

In Botswana, it was very hard to book appointments to meet and interview people. When meetings were scheduled, they were almost always cancelled. What worked well was to just show up and talk our way to interviews. Often, we could hold the interview right away or come back later the same day or the next day. Consequently, we almost never knew how the day would look. In the morning, our supervisor picked us up and then we went from one place to the other to try to interview people. In the evenings, we structured the information, tried to plan (even if plans were always changed), rewrote interview questions, and prepared for the next day.

The thesis will be distributed to all people interviewed and other people met in Botswana, but we will not continue working on it. People from Botho University will be invited to the presentation.

### **Country**

The culture of Botswana is very friendly. People always greet each other and ask how they are. Nature in the country is also very beautiful, but there is not much nature in the capital city of Gaborone. Catcalling was a problem, but we were (almost) never scared. We heard there is a risk of robbery, but we felt safe. The new way described above of getting hold of people led to some culture shock in the beginning. It was frustrating when meetings were cancelled, but we managed it well with the help of Samuel. The pace is slower in Botswana than in Sweden, which also required adaptation. For example,

it took two hours to do what is needed to access to university's Wi-Fi and another two hours to be able to pay the rent.

### **Leisure and social activities**

In our spare time, we spent time with friends, tried restaurants, climbed Kgale Hill, sunbathed on the balcony, visited church services, tried workout classes, etc. We also went on safari – both close to Gaborone and far away. The ones close to Gaborone were Gaborone Game Reserve and Mokolodi. We also travelled to Kasane to go on a safari in the Chobe National Park and visit the Victoria Falls. Both the safari (including sleeping in the park in a tent) and the Victoria Falls in Zimbabwe and Zambia were incredible experiences. Many students were playing sports on campus, but we did not ask to join them. Generally, it was easy to connect with locals, but our intense project work did not allow us to get to know a lot of people. Something that made it harder to find friends was that we did not take any classes on campus, but since people are very friendly and approaching it was not too much of a problem.

### **Sustainability**

We went around Gaborone in our supervisor's car and by using taxis since public transport is a bit complicated and time-consuming. When going to Kasane we went by flight to due time constraints, but it would have been possible to travel by night bus. It was not possible to recycle plastic, paper, cans, etc., which we were very unused to in the beginning.

Regarding, our project's connection to the Sustainable Development Goals it primarily connects to the *SDG7: Clean Energy for All* since it aimed at contributing to both increased electricity access rate and to increase the adoption of solar power.

### **Other recommendations and observations**

I really recommend to app InDrive to get around town. It worked very well, we always felt safe, and it allowed us to move around independently. Further, I would also really recommend going on a safari and to see the Victoria Falls. An observation is that it is not that much to see in and around Gaborone but a lot to see in Botswana if one has the time and money to get around. There is a nice outdoor restaurant called Sanitas Tea Garden, which is located by the Swedish consulate. Finally, I would recommend meeting students from Botswana in Sweden before traveling to have some connections in the country when coming there.

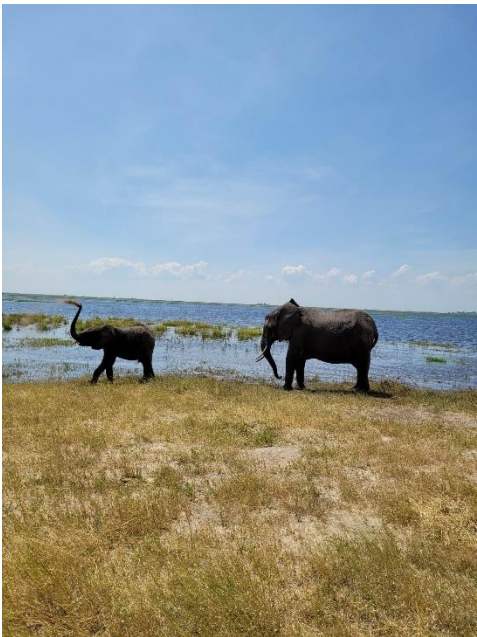
### **Contact information**

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**Photos**

Elephants in Chobe



A family's cooking place in the Gakgatla village



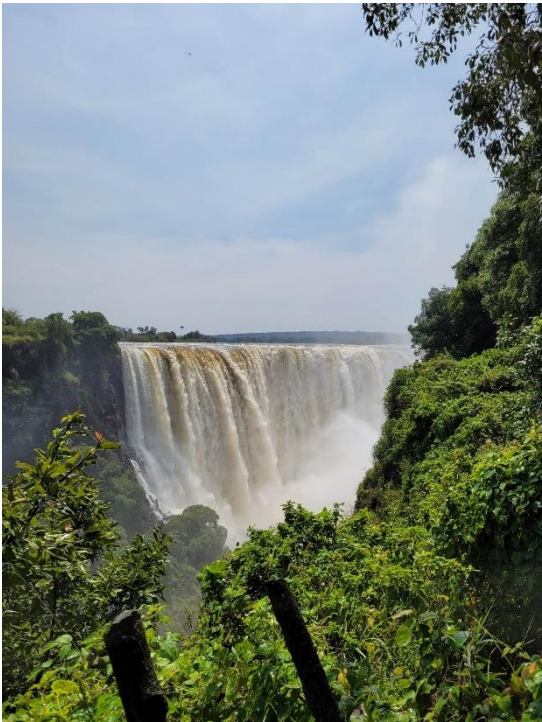
Ellinor and I in Gaborone close to Sanitas Tea Garden



Zebras in Gaborone Game Reserve



The Victoria Falls



At Sanitas Tea Garden



A donkey cart in one of the visited villages



Washing clothes in the apartment



Sunset in Gaborone

