Crossing the stream from Chipulukusu to rural charcoal production areas

It was the beginning of a long day in Zambia when we needed to cross a river to observe charcoal production in the rural areas. The only way to get across was a hollowed out tree trunk I shared with three other colleagues and a guide. This stream is the only form of transportation to bring charcoal cooking fuel from the rural areas to Chipulukusu, an informal settlement of over 40,000 people in the Copperbelt province of Zambia. Compared to my visit the year before, the water level was significantly lower from lack of rain, increasing challenges for those relying on this stream for their livelihood in the charcoal business. This is just one example of the many ways Chipulukusu is burdened by climate change. It is also one of the many reasons that prompted a European startup organization to begin engaging with this community to better equip them against these threats to their wellbeing.

No matter the intentions of this startup organization, there is no denying the long and complex history of humanitarian work and its negative impact on low income communities, especially under the backdrop of colonialism. Africa in particular tends to be viewed as a "recipient of science, technology, and innovation," incapable of developing their own renewable energy solutions in the face of climate change[1]. This startup sought to be different from the others, and explicitly told me that it wanted to form a healthy partnership with the community—and more importantly, it was willing to try some new tactics to achieve that goal.

Fuel-efficient cookstove provided by organization (left), and the traditional stove (right)

As a PhD candidate in Contextual Engineering [2], I specialize in fitting a technology to unique local conditions while cultivating community agency. Because of this, the organization and I formed an agreement in 2022 where I would assist them with contextual implementation of their fuel-efficient cookstoves. In return, I'm able to get a good "behind the scenes" view of the organization, watching their day-to-day decision-making and actions.

The challenge with this kind of work is that our intentions do not guarantee outcomes, and while this organization has a strong desire to work collaboratively with Chipulukusu, it is battling colonial power dynamics and also needs to be able to survive as a startup. What is *actually* happening on the ground in Chipulukusu, and how does it compare to the organization's intents? Can intentions survive to implementation when faced with power

imbalances, cultural differences, and resource constraints? This question was at the core of my research objectives for the visit.

With the help of the ACES International Graduate Grant, I was able to have my third and longest stay yet in Chipulukusu during May-July 2024. It was my first opportunity to thoroughly collect my own data and assessment of the project independent of the data collected by the organization. My goal was to interview and interact with as many project stakeholders as possible, which included:

- Households that received an organization cookstove, and households that didn't
- Locally hired organization personnel
- People in the charcoal production chain (producers, transporters, sellers)
- Local business owners
- Local leadership (Chief and local councilor)

Interviewing a charcoal producer/transporter

When I first arrived in May, I took some time to understand the day to day operations of the organization, following around staff members as they went about their day. A team of 10 locally hired field officers check in with each of the 1,000 cookstove recipients monthly, so I tagged along with a few of them to observe what this monitoring process looked like and

to begin understanding some of the cultural customs around meeting people in their homes.

While some community members speak English proficiently, most residents speak Bemba, so I needed the help of a local translator from outside the organization to join me for interviews. I managed to find a very bright student in the community who not only interpreted my interview questions, but knew how to ask questions in a way that made people feel comfortable.

After 20 practice interviews to refine my questions, I was ready to interview 250 households, going door to door with my translator while a field officer from the organization pointed out the right houses. Most days were filled with walking throughout the community conducting interviews, whether it was households, local businesses, or people involved in charcoal production. By the time I left, I had completed over 350 interviews and covered large amounts of ground in the community.

Street view of an area in Chipulukusu

The more households I visited, the more I learned about Chipulukusu, and I was surprised to find so much contrast among neighborhoods in terms of socioeconomic status, beliefs, and access to technology. I saw firsthand how new, high-efficiency cookstoves distributed by the organization were making a significant difference in the households they were in, allowing families to cook faster, spend less money on charcoal, and inhale less smoke. One family told me that the same bag of charcoal can now sustain them for twice as long, and they can now spend more money on supporting their children.

However, I could also see how the stoves were adversely affecting the charcoal market. Charcoal sellers talked to me about how people buy their fuel half as often and it is affecting their ability to make a living from selling charcoal. This issue is particularly difficult to address given the extensive production chain – from those who cut down trees

to those who convert the wood to charcoal to those who sell the fuel. You can try to solve a problem in one spot but it will likely create another problem elsewhere along the chain.

A typical stand in one of the charcoal markets

The issue of charcoal is also complicated by the lack of rains from this season. Depletion of water supply is especially detrimental for Zambia as approximately 83% of their electricity generation is derived from hydropower[3]. The severe drought was not only affecting the country's access to water, but also its ability to generate electricity.

I experienced these challenges with electricity when I visited. In an attempt to conserve power, Zambia was strategically cutting electricity, or "load shedding" for about 8 hours each day when I arrived in May. By the time I left in July, we were lucky to see power for a few hours a day, and often the power would be cut for days at a time. People who used electricity to cook were now forced to resort to charcoal—including my team. A vicious cycle is now created: deforestation from charcoal contributes to climate change, which affects Zambia's power generation, which increases its demand for charcoal and therefore deforestation.

I could not have understood the relationship of these challenges and how people were adapting if I had not spent this time on the ground in Chipulukusu. I learned how people involved in charcoal production were painfully aware of deforestation but still needed to make a living. I learned how people in the community perceived climate change, but felt powerless against it. I talked to people who had adapted their careers because their business was no longer viable without consistent access to electricity.

My extended visit to this community was a testament to the importance of understanding local mindsets and processes when trying to engineer a solution. The information I gathered is instrumental in my ongoing collaboration with the organization and helping them develop an approach that identifies the locally expressed needs and addresses them without causing significant disruptions in the community.

References

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